Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune

(Maharashtra)

Criterion 2: Teaching Learning & Evaluation

Key Indicator:2.2 Catering to Students Diversity

2.2.1 The institution assesses the learning levels of the students, after admission and organizes special programs for advanced and slow Learners

1. Slow learners and advanced learners are identified by each subject teacher according to the policy of college
2. Activities for advanced and slow learners are conducted by each subject teacher

Sr. No.	Activities for Slow and Advanced Learner	Remark
	Sample Documentary Evidences	
1	Arrangement of First Year Induction Program after Admission to Aware/Set the Students in New Environment	
2	Identification Policy for Slow and Advanced Learners	
3	Sample List of Advanced and Slow learner	
	Activities for Slow Learners	
4	Remedial Coaching Classes	
5	Assignments for Slow Learners	
6	Prerequisites Lectures for Subjects	
7	Provision of Question Paper with Solution	
8	Provision of Hand-Written Notes for Subjects	
9	Provision of Question Bank for Practice at Home	
10	Personal Attention in Learning Levels through Teacher Guardian.	
	Activities for Advanced Learners	
11	NPTEL/Advanced Courses through NPTEL Chapter	
12	NPTEL Videos Availability for All subjects	
13	Technical Paper Presentation in National /International Level Conference	

14	Technical Quiz Competition	
15	Arrangement of Seminar /Workshop /Conference for Students	
16	Arrangement of Expert Guest Lectures	
17	Industry Sponsored Internships	
18	Seminar's to Promote Presentation Skills	
19	MOU's with Various Reputed Industries/Institutes	

Principal
Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engg.,
Dhangawadi, Pune-412206

1. FIRST YEAR INDUCTION PROGRAM

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Date: 27/07/2017

NOTICE

All staffs of First Year Engineering department are hereby informed that, staff meeting is schedule on 28/07/2017 in H.O.D cabin at 2.00 pm to discuss about Induction programme organized on 1st August 2017.

Meeting Agenda:

- Planning of arrangement of Induction programme conduction.
- Committee formation of the staffs for different responsibilities.
- Hospitality of the guests, students & parents.

Prof. R.B. Raut

Event Co-Ordinator

Prof. J.G.Kale

H.O.D (FE)

Head of Department
First Year Engineering
Shri Chh. Shivajiraje College of Engg.
Dhangawadi, Pune-412206

Shri Chhatrapati Shivajiraje College of Engineering * RD
F. E. Deptt.

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department of First Year Engineering

INDUCTION PROGRAMME FOR F.E STUDENTS

Event Date: 1st August 2017-

Sr.No.	Time	Activity
1.	10.00 a.m. to 10.45 a.m.	Students welcome at the entrance of seminar hall.
2.	10.45 a.m. to 11.00 a.m.	Respected Principal & all H.O.D'S welcome at the seminar hall.
3.	11.00 a.m. to 11.15 a.m.	Inauguration, Teachers felicitation by student council members.
4.	11.15 a.m. to 11.30 p.m.	Chief Guest Mr. Deepak Wani welcome & felicitation by Principal.
5.	11.30 p.m. to 11.35 p.m.	Saraswati pujan by Chief Guest & Respected Principal.
6.	11.35 p.m. to 12.00 p.m.	College information on PPT by Prof. R. B. Kesarkar and Prof. A. S. Sondkar.
7.	12.00 p.m. to 1.00 p.m.	Refreshment
8.	1.00 p.m. to 1.30 p.m.	Speech by respected Principal sir.
9.	1.30 p.m. to 2.00 pm	Speech by Chief Guest.
10.	2.00 p.m. to 2.30p.m.	Departmental information by all H.O.D's.
11.	2.30 p.m. to 2.45 p.m.	Felicitation of rankers of academic year 2016-17
12.	2.45 p.m. to 3.00 p.m.	Conclusion of the function and vote of thanks by Prof. Shailesh Patil.

Prof. R. B. Raut

Event Co-Ordinator

Prof. J.G. Kale

HOD (FE)

Shri Chhatrapati Shivajiraje College of Engineering F.E. Dept.

Head of Department
First Year Engineering
Shri Chh. Shivajiraje College of Engg.
Dhangawadi, Pune-412206

॥ प्रज्वलितो ज्ञानमयः प्रदिपः ॥
Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engineering
Approved by AICTE, Govt of Maharashtra and Affiliated to the University of Pune (ID NO PU/PN/Engg/376/2009)
Dr. Bhagyashree s. Patil
Hon. secretary
Anantrao Thopte
Founder President
Ex. Education Minister
Maharashtra State

Department of First Year Engineering

Date: 20/07/2017

INVITATION LETTER

To,
Mr. Deepak Wani,
Manager of Pari Compony,
Tal: Khandala, Dist: Satara

Subject: Invitation for conducting lecture on **"Induction Function"** on **01st August 2017.**

Dear Sir,

It gives us immense pleasure to announce that Rajgad Dnyanpeeth's Shri Chhatrapati Shivajiraje College of Engineering, Department of First Year Engineering has scheduled alecture for **"Induction Function"** on **01/08/2017**for FE students of our Institute.

It gives us great pleasure to invite you as a guest speaker for above said lecture.

Please, accept this invitation and acknowledge the same.

Thanking You,
Yours truly,

Prof. R. B. Raut
Coordinator

Received
Dwani

Shri chhatrapati Shivajiraje College of Engineering ★ RD
F. E. Dept.

Prof. J. G. Kale
HOD
Head of Department
First Year Engineering
Shri Chh. Shivajiraje College of Engg.
Dhangawadi, Pune-412206

॥ प्रज्वलितो ज्ञानमयः प्रदिप्त: ॥
Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engineering
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Dr. Bhagyashree s. Patil
Hon. secretary
Anantrao Thopte
Founder President
Ex. Education Minister
Maharashtra State

Department of First Year Engineering

Date: 01/08/2017

CONDUCTION LETTER

To,
Mr. Deepak Wani,
Manager of Pari Compony,
Tal: Khandala, Dist: Satara

Subject: Expression of Gratitude.

Dear Sir,

This is an appreciation for your valuable time and interest in Inspirational Lecture on **"Induction Function"** on **01/08/2017** for FE students of our Institute.

We are very thankful to you for sharing your valuable knowledge and sparing time to guide our staff and students. Hope you will extent your cooperation in future also.

Thanking You,

Prof. J. G. Kale
HOD
Head of Department
First Year Engineering
Shri Chh. Shivajiraje College of Engg.
Dhangawadi, Pune-412206

Shri Chhatrapati Shivajiraje College of Engineering ★ RD
F. E. Dept.

Received.
Dpani

RajgadDnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department of First Year Engineering

Induction Function

DEPARTMENT: **F.E**

CLASS: **F.E 2017-18**

TITLE/TOPIC: **Induction Function**

DAY & DATE: **Tuesday 01/08/2017**

DURATION OF EVENT: **5hrs**

STUDENT/ STAFF PRESENT: **89/15**

DEPARTMENT CO-ORDINATOR: **Prof. R.B. Raut**

OBJECTIVE: Induction programme is an initiative to groom the overall personality of students and make them acquainted with the culture of the institution. The induction programme for the students of first year engineering was held on 1st august 2017. The aim of the function was to ensure that every student feels welcomed, engaged and excited to begin this new important stage in their education. The idea was to make the students aware of their prospective opportunities and to show them the path they have adopt in order to become successful engineers.

DESCRIPTION:On Tuesday01/08/2017 FE department had organized Induction Functionfor FE students. For such a event our special guest was Mr. Deepak Wani (Manager Of Pari Compony), Respected Principal Dr. S. B. Patil, Respected Head of Departments of E & TC, Civil, Mechanical and Computer departments were present.

The program was started with Swarswati pujan by our guest Mr. Deepak Wani & principal sir. Prof. T. S. Zende was hosting this ceremony conducted by department. After swaraswati pujan department had given felicitation to Dr. S. B. Patil, HOD's of all departments, Teachers of FE and all students of FE.

Our respected Principal Dr. S. B. Patil had given very inspiration speech to the students for their bright future and given guidance regarding to engineering, technology and about Rajgad Dnyanpeeth's Shri Chhatrapati Shivajiraje College Of Engineering.

Our guest Mr. Deepak Wani gave motivational speech to all students about career guidance, importance of engineering & future opportunities in engineering.

(P.T.O)

All HOD's also sharing their thought, views about their department and college and some ideas in front of the students. Some students of SE, TE and BE sharing their respects regarding to college, their Departments and Teachers.

Prof.T.S. Zende gave vote of thanks to all the respected guests, HOD's Teachers, Non – teaching staff and Student for their support to make this event successful & the program end with small refreshment to students and all.

Photos during Program:

Chief Guest Mr. Deepak Waniwelcome & felicitation by PrincipalDr. S. B. Patil

(P.T.O)

Saraswatipujan by Chief Guest, Principal sir & all H.O.D's

Mr. Deepak Wani during addressing students

H.O.D of FE department addressing students

(P.T.O)

Felicitation of rankers of academic year 2016-17

Prof. R.B. Raut

Event Co-Ordinator

Prof. J.G. Kale

HOD (FE)

Head of Department
First Year Engineering
Shri Chh. Shivajiraje College of Engg.
Dhangawadi, Pune-412206

Shri chhatrapati Shivajiraje College of Engineering * F. E. Deptt.

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department of First Year Engineering

Attendance Record for Induction Programme 2017-18

Date: 01/08/2017

Sr. No.	Name of the Students	Sign.
1.	Kajal Mohan Kinhale	Kinhale
2.	More Sourabh Laxman.	More
3.	Mane Omkar	Omkar
4.	Aniket Naresh Kank	Ank
5	Ishita Rajoria	Ishita
6.	Malwadkar Rushikesh S.	
7)	Malwadkar Anil	Anil
8)	Prathmesh S. Jagtap	Jagtap
9.	Kanade Ashwini	Kanade.
10	Anuja Popat Jadhav	A.P.Jadhav
11	Hinge Prathamesh	Hinge
12.	Chaitany chhute	
13)	Jadhav Shweta Mahendra	Shweta
14)	Mayuri Ganesh Dhanawade	Mayuri
15)	Sayali Nigade	Nigade
16)	Wani Kush	Kwani
17)	Pratiksha S. Lad	Lad
18)	Bhikaji Bagave	
19)	Rohini Vikram Nannaware	Rohini
20)	Pawar Sunil Popat.	Pawar

Sr. No.	Name of the Students	Sign.
21.	JADHAV ASHISH	Jadhav
22.	Rohit Rajmane	
23.	Yuvraj Pawar	Yuvraj
24)	Vishesh santosh Umbarkar	V
24.	Anushri Kadam	Anu
26.	Sushant Sanjay Patil	SS. Patil
27)	Yasin Kazi	Kazi
28	Mayuri Jamdade	Jamdade
29.	Kamathe Somnath.	Kamathe
30)	Kadam Dhiraj	Dhiraj
31)	Sakshi Gaikwad	Sakshi.
32)	Vishal Nivrutiti Suryawanshi	Suryawanshi
33)	Pawar Chaitrali	Chaitrali
34)	Afrin Sayyad	
35)	Rutuja Rajendra Mane	Rutuja M.
36.	Shelar Omkar Ramchandra	OmkarShelar
37.	Phapate Ujwala	Phapate
38.	Dinesh Ramani	
39)	Arkade Sumit K.	Sumit.A.
40)	Utkarsh Balaso Patil	U.B. Patil
41)	Pawal Kirti.	Kirti.s.Pawal
42)	Ankita karape	Akarape
43)	Pednekar Pratiksha.	P.Pednekar
44)	Salunke Ankita	Ankita
45)	Vivekanand Nalbhosale	Vivo
46)	Vishal Jaywant Valkunde	Vishal
47)	Vrushali Shital Madwanna	Vmad
48)	Aniket Anantrao Phalke	Aphalke
49)	Vishal Kshirsagar	Vishal
50)	Vishal Balu Ingole	Vingole
51)	Manasi Prashant Bathe	Bathe
52)	Bhoite Ganesh	

Sr. No.	Name of the Students	Sign.
53.	Supriya Kambale	
54.	Prasad Konde	
55)	Ajinkya Kunjir	
56.	Sachin Gaikwad	
57.	Dattatray Kavchat	
58)	Vaishnavi Datta Kasab	
59)	Yitesh Shinde	
60)	Bhimrao Devidas Rathod	
61)	Shanatanu Shinde	
62.	Shravan Shantaram Gadade	
63.	Pooja A. Mane	
64.	Abhishek Shinde	
65.	Nellanjali Chemate	
66)	Pragati Balasaheb Jagtap	
67.	Arati Pawar	
68	Sangram Salunkhe	
69.	Pradyn Dattatray Jadhav	
70	Someshwar Solat	
71	Tejashree Deshmukh	
72)	Vidhya Bhausaheb Jadhav	
73)	Khatape Namrata	
74)	Pooja Tapare	
75.	Prasad Ashok Malawade	
76)	Trupti Bajarang Sonawane	
77)	Shagufta Khalid Ansari	
78)	Somnath Rajendra Kamathe	
79)	Gorad Snehal	
80.	Shubham Mane	
81.	Aniket Ashok Athare	
82)	Vikrant Prabhakar Jadhav	
83)	Chetan Nevase	
84)	Vikas Ambawale	

Sr. No.	Name of the Students	Sign.
85)	Rutuja Pawar	Rutuja
86)	Deepak Sunil Dhumal	Dhumal.
87)	Amit Mangesh Jadhar	Amit
88)	Pratik Uttam Gavhane	
89)	Akash Suryakant Kanade	Akash

SAMPLE PPT'S DURING INDUCTION PROGRAM

Shri Chhatrapati Shivajiraje College of Engineering, Dhangawadi

Heartly Welcomes you !!!

Department of First Year Engineering

Organizing

Orientation Program

(1st August 2017)

Academic Schedule For Semester-I

- **Commencement of teaching: 01/08/2017**
- **College Working Time: 10.00am to 5.00pm**
- **Odd Saturday's will be holiday's.**

Examination Schedule For Semester-I

- **Unit Test-I and Online Exam Phase-I**
  (First Week of September)
- **Unit Test-II and Online Exam Phase-II**
  (Second Week of October)
- **University Theory Examination Phase-III**
  (Second Week of December)

SPPU Examination Scheme for FE

- **Phase I: Online examination**

25Marks (30min duration)

Contains MCQ's on unit I and unit II

- **Phase II: Online examination**

25Marks (30min duration)

Contains MCQ's on unit III and unit IV

- **Phase III :Theory examination**

50Marks (2hrs duration)

Written examination based on all six units

Structure of Question Paper

For Online Examination (Phase I & II) 50 Marks

All question's are objective type with multiple choice/fill in the blanks type questions of 1 or 2marks. More or less weightage is to be given to every unit

For Theory Examination (Phase III) 50 Marks (End Semester Examination)

Q.1 or Q.2 based on unit 1 and 2 with 25% weightage
Q.3 or Q.4 based on unit 3 and 4 with 25% weightage
Q.5 or Q.6 based on unit 5 with 25% weightage
Q.7 or Q.8 based on 6 with 25% weightage

Assessment

Online examination assessment is computer based Theory examination assessment will be done at the CAP centre by the experts appointed as an examiner.

Termwork

Termwork is continuous assessment based on work done, submission of work in the form of journals, timely completion, attendance, and understanding. It is assessed by subject teacher of institute. Marks obtained in termwork will be submitted to SPPU. The student who fails in the termwork on account of unsatisfactory performance shall be given fail grade.

Rules of passing

To pass in theory subject student has to earn minimum 40% marks in end semester exam and 40% marks average (Online + Theory Exam)

Student can only apply for revaluation/photocopying of end semester exam only

CGPA and Class Awarded

Sr. No.	CGPA	Class of the Degree Awarded
1	7.75 or More than 7.75	First Class with Distinction
2	6.75 or more but less than 7.75	First Class
3	6.25 or more but less than 6.75	Higher Second Class
4	5.5 or more but less than 6.25	Second Class

TABLE -2 Structure for Semester-1

	Code	Subjects	Short Name	Weekly Work Load (In Hrs)			Semester Examination Scheme of Marks						Credits
							Theory		TW	PR	OR	Max. Marks	
				Lectures	Tutorials	PR/DRG	In-Semester Exam	End-Semester Exam					
	107001	Engineering Mathematics I		4	1	–	50	50	25	–	–	125	5
#	107002/ 107009.	Engineering Physics OR Engineering Chemistry		4	–	2	50	50	25	–	–	125	5
	110003	Engineering Graphics I		3	–	2	50	50	–	-	–	100	4
#	103004/ 104012	Basic Electrical Engineering OR Basic Electronics Engineering		3	–	2	50	50	25	–	–	125	4
	101005	Basic Civil and Environmental Engineering		3	–	2	50	50	25	–	–	125	4
	102006	Fundamentals of Programming Languages I		1	–	2	-	-	–	50*	–	50	2
	111007	Workshop Practice		–	–	2	–	–	50	–	–	50	1
	Total of Semester I			18	1	12	250	250	150	50	–	700	25

TABLE - 3 Structure for Semester-2

	Code	Subjects	Short Name	Weekly Work Load (in Hrs)			Semester Examination Scheme of Marks						Credits
							Theory		TW	PR	OR	Max. Marks	
				Lectures	Tutorials	PR/ DRG	In-Semester Exam	End-Semester Exam					
	107008	Engineering Mathematics II		4	–	–	50	50	–	–	–	100	4
#	107009/ 107002	Engineering Chemistry OR Engineering Physics		4	–	2	50	50	25	–	–	125	5
	110010	Basic Mechanical Engineering		3	–	2	50	50	25	-	–	125	4
	101011	Engineering Mechanics		4	–	2	50	50	25	–	–	125	5
#	104012/ 103004.	Basic Electronics Engineering OR Basic Electrical Engineering		3	–	2	50	50	25	–	–	125	4
	102013	Fundamentals of Programming Languages II		1	–	2	-	-	-	50*	–	50	2
	102014	Engineering Graphics II		–	–	2	–	–	50	–	–	50	1
	Total of Semester II			19	–	12	250	250	150	50	–	700	25

Teacher Guardian (TG) Scheme

- **Teacher Guardian will be appointed for batch of 20 students approximately to monitor academics of students.**

- **TG's will remain in contact with parents for all academic issues**

2. IDENTIFICATION POLICY FOR SLOW AND ADVANCED LEARNERS

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

DEPARTMENT OF FIRST YEAR ENGINEERING

Policy for Advanced, Average and Slow Learners based on Unit Test-I

1. Students who have scored 75% and above marks considered as advance learners.
2. Students who have scored above 40% and below 75% marks are considered as average learners.
3. Students who have scored below 40% marks and absent for test are considered as slow learners.

HOD

Head of Department
First Year Engineering
Shri Chh. Shivajiraje College of Engg.
Dhangawadi, Pune-412206

Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engg.
DTE:6324
SPPU:
Dhangawadi
Pune
412206

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department of First Year Engineering

Semester-I **A.Y.2017-18**

Unit Test-I Mark Sheet

Class: F.E.(B) **Subject:- Engineering Mathematics-I**

Roll No.	Name of Student	Marks(25)
1711001	Konde Prasad Pandurang	12
1711002	Jadhav Saurabh Laxman	16
1711003	Shinde Ritesh Arvind	20
1711004	Gaikwad Sachin Dhondiba	12
1711005	Kavchat Dattatray Abhiman	AB
1711006	Kasab Vaishnavi Datta	14
1711007	Shinde Abhishek Sunil	9
1711008	Shinde Shantanu Vijay	2
1711009	Pawar Yuvraj Harishchandra	9
1711010	Kadam Anushri Ramdas	23
1711011	Patil Utkarsh Balaso	9
1711012	Umbarkar Vishesh Santosh	9
1711013	Patil Sushant Sanjay	11
1711014	Kazi Yasin Yunus	14
1711015	Vidhole Nilesh Subhash	12
1711016	Mane Rutuja Rajendra	13
1711017	Valkunde Vishal Jayvant	8
1711018	Valkunde Karan Rajendra	16
1711019	Chandanshiv Nikhil Anil	22
1711020	Phalke Aniket Anandrao	11
1711021	Gaikwad Sakshi Sunil	8
1711022	Madwanna Vrushali Shital	23
1711023	Bathe Manasi Prashant	18
1711024	Suryawanshi Vishal Nivrutti	8
1713001	Hinge Prathamesh Balasaheb	**21**
1713002	Bagwe Bhikaji Anil	14
1713003	Kadam Dhiraj Suhas	8
1713004	Raorane Divyesh Pandurang	9
1713005	Salunkhe Ankita Sanjay	13
1713006	Bobade Ganesh Arjun	15
1713007	Kamble Supriya Sunil	18
1713008	Mane Pooja Ashok	15
1713009	Dhaigude Kiran Keshav	16
1713010	Pawar Rutuja Santosh	14
1713011	Gorad Snehal Sandesh	14
1713012	Pawar Arati Jagannath	12
1713013	Kunjir Ajinkya Rajendra	12
1713014	Nigade Sayali Bhanudas	12
1713015	Chothe Chaitanya Jagannath	15
1713016	Rajmane Rohit Chandrakant	13

1713017	Sayyad Aafrin Imrahim	9
1713018	Nalbhosale Vivekanand Yashwant	14
1713019	Karpe Ankita Yshwant	7

Total Number of Students :	43
Total Number of Students Appeared:	42
Total Number of Students Passed:	30
Total Number of Students Failed:	12
Result in Percentage :	**71.43**

(Prof. Jadhav Y.G)

3. SAMPLE LIST OF SLOW AND ADVANCED LEARNERS

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

DEPARTMENT OF FIRST YEAR ENGINEERING

LIST OF ADVANCED LEARNERS

Subject:-Engg. Maths-I A.Y(2017-18) Sem-I

Subject Teacher:- Prof. Y.G.Jadhav Div-B

Sr.No	Name of Students
1	Shinde Ritesh Arvind
2	Kadam Anushri Ramdas
3	Chandanshiv Nikhil Anil
4	Madwanna Vrushali Shital
5	Hinge Prathamesh Balasaheb

Subject Teacher

Rajgad Dnyanpeeth's Shri Chhatrapati Shivajiraje

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

DEPARTMENT OF FIRST YEAR ENGINEERING

LIST OF WEAK STUDENTS

Subject:-Engg. Maths-I A.Y(2017-18) Sem-I

Subject Teacher:- Prof. Y.G.Jadhav Div-B

Sr.No	Name of Students
1	Kavchat Dattatray Abhiman
2	Shinde Abhishek Sunil
3	Shinde Shantanu Vijay
4	Pawar Yuvraj Harishchandra
5	Patil Utkarsh Balaso
6	Umbarkar Vishesh Santosh
7	Valkunde Vishal Jayvant
8	Gaikwad Sakshi Sunil
9	Suryawanshi Vishal Nivrutti
10	Kadam Dhiraj Suhas
11	Raorane Divyesh Pandurang
12	Sayyad Aafrin Imrahim
13	Karpe Ankita Yshwant

Subject Teacher

Prof. Jadhav Y. G

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department Of First Year Engineering

Academic year: 2017/18 (Sem-I) **Date: 16/08/2017**

Notice

All first year students are hereby informed that, the remedial classes are starting from 19/08/2017 on first and third Saturday. The classes are scheduled as per following timetable. Attendance is compulsory for the classes.

Sr. No	Time	Subject
1	10.00-11.00 am	Basic Electronic Engineering and Basic Electrical Engineering
2	11.00-12.00 pm	Engineering Physics and Engineering Chemistry
3	1.00-3.00 pm	Engineering Mathematics-I

Rajgad Dnyanpeeth's DTE 0324 SPPU:467/1 Dhangawadi Pune 412206 Shri Chhatrapati Shivajiraje College of Engg.

HOD

Prof. Kale J. G

4. REMEDIAL COACHING CLASSES

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department of First Year Engineering

Semester-I **A.Y.2017-18**

Remedial Lecture Attendance Sheet

Class: F.E.(B) **Subject: Engineering mathematics-I**

Lecture No.	Contents Covered
1	System of linear eq^ns & eigen value, eigen vector.
2	Demoivre's th^m, convergence test, Leibnitz rule.
3	Taylor's & maclaurins th^m & L. Hospital rule.
4	Eulers theorem & maxima minima

Sr. No.	Name of Student	16/Dec/17	7/Jan/17	21/Jan/17	18/Jan/17
1	Kavchat Dattatray Abhiman	Kavchat	Kavchat	Kavchat	Kavchat
2	Shinde Abhishek Sunil	ASshinde	Ab	ASshinde	ASshinde
3	Shinde Shantanu Vijay	[illegible]	[illegible]	[illegible]	Ab
4	Pawar Yuvraj Harishchandra	ypaw	ypaw	ypaw	ypaw
5	Patil Utkarsh Balaso	UBpatil	UBpatil	UBpatil	UBpatil
6	Umbarkar Vishesh Santosh	[illegible]	Ab	[illegible]	[illegible]
7	Valkunde Vishal Jayvant	Ab	Vishal	Vishal	Vishal
8	Gaikwad Sakshi Sunil	Ab	[illegible]	[illegible]	[illegible]
9	Suryawanshi Vishal Nivrutti	VS	VS	Ab	Ab
10	Kadam Dhiraj Suhas	DK	DK	DK	Ab
11	Raorane Divyesh Pandurang	DR	DR	DR	Ab
12	Sayyad Aafrin Imrahim	ASayyad	Ab	ASayyad	ASayyad
13	Karpe Ankita Yshwant	Ab	AYkarpe	Ab	AYkarpe

Sign of Subject Teacher

(Prof. Jadhav Y.G.)

Rajgad Dnyanpeeth's Shri Chhatrapati Shivajiraje College of Engg. DTE:6324 SPPU:4071 Dhangawadi Pune 412206

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

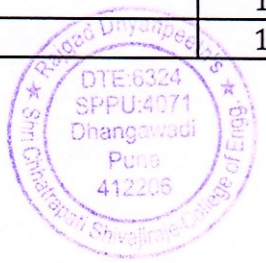
Department of First Year Engineering

Semester-I **A.Y.2017-18**

Result Comparison Sheet

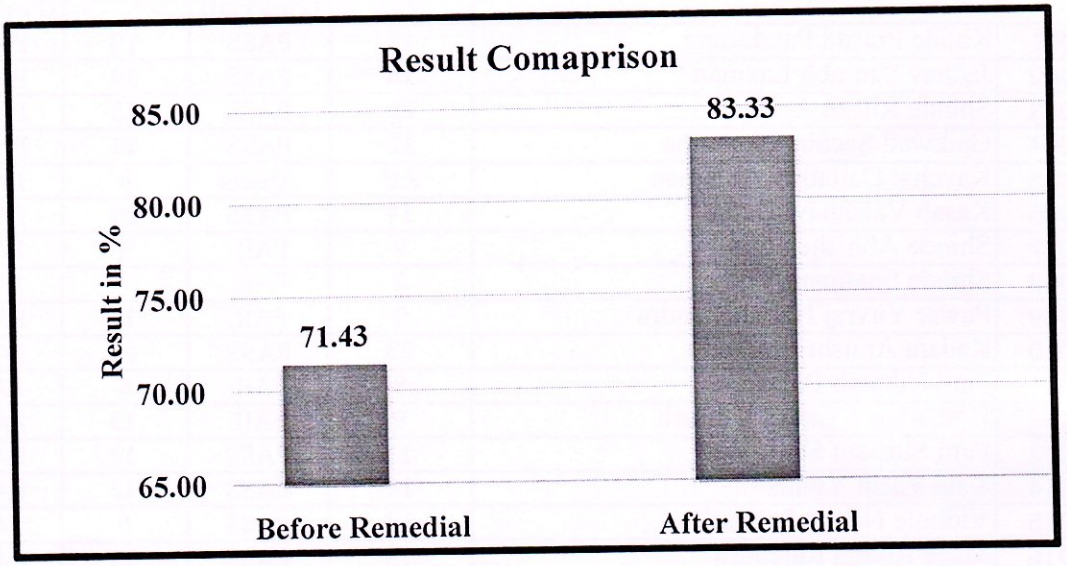
Class: F.E.(B) **Subject:- Engineering Mathematics-I**

Roll No.	Name of Student	Before Remedial (UT-I)		After Remedial (UT-II)	
		Marks(25)	Result (Pass/Fail)	Marks(25)	Result (Pass/Fail)
1711001	Konde Prasad Pandurang	12	PASS	19	PASS
1711002	Jadhav Saurabh Laxman	16	PASS	10	PASS
1711003	Shinde Ritesh Arvind	20	PASS	15	PASS
1711004	Gaikwad Sachin Dhondiba	12	PASS	19	PASS
1711005	Kavchat Dattatray Abhiman	AB	Absent	8	FAIL
1711006	Kasab Vaishnavi Datta	14	PASS	20	PASS
1711007	Shinde Abhishek Sunil	9	FAIL	9	FAIL
1711008	Shinde Shantanu Vijay	2	FAIL	7	FAIL
1711009	Pawar Yuvraj Harishchandra	9	FAIL	13	PASS
1711010	Kadam Anushri Ramdas	23	PASS	15	PASS
1711011	Patil Utkarsh Balaso	9	FAIL	5	FAIL
1711012	Umbarkar Vishesh Santosh	9	FAIL	15	PASS
1711013	Patil Sushant Sanjay	11	PASS	12	PASS
1711014	Kazi Yasin Yunus	14	PASS	12	PASS
1711015	Vidhole Nilesh Subhash	12	PASS	9	FAIL
1711016	Mane Rutuja Rajendra	13	PASS	13	PASS
1711017	Valkunde Vishal Jayvant	8	FAIL	7	FAIL
1711018	Valkunde Karan Rajendra	16	PASS	18	PASS
1711019	Chandanshiv Nikhil Anil	22	PASS	12	PASS
1711020	Phalke Aniket Anandrao	11	PASS	17	PASS
1711021	Gaikwad Sakshi Sunil	8	FAIL	14	PASS
1711022	Madwanna Vrushali Shital	23	PASS	22	PASS
1711023	Bathe Manasi Prashant	18	PASS	10	PASS
1711024	Suryawanshi Vishal Nivrutti	8	FAIL	18	PASS
1713001	Hinge Prathamesh Balasaheb	21	PASS	21	PASS
1713002	Bagwe Bhikaji Anil	14	PASS	9	FAIL
1713003	Kadam Dhiraj Suhas	8	FAIL	AB	Absent
1713004	Raorane Divyesh Pandurang	9	FAIL	17	PASS
1713005	Salunkhe Ankita Sanjay	13	PASS	15	PASS
1713006	Bobade Ganesh Arjun	15	PASS	18	PASS
1713007	Kamble Supriya Sunil	18	PASS	13	PASS
1713008	Mane Pooja Ashok	15	PASS	17	PASS
1713009	Dhaigude Kiran Keshav	16	PASS	12	PASS
1713010	Pawar Rutuja Santosh	14	PASS	15	PASS
1713011	Gorad Snehal Sandesh	14	PASS	15	PASS
1713012	Pawar Arati Jagannath	12	PASS	11	PASS
1713013	Kunjir Ajinkya Rajendra	12	PASS	17	PASS
1713014	Nigade Sayali Bhanudas	12	PASS	15	PASS



1713015	Chothe Chaitanya Jagannath	15	PASS	15	PASS
1713016	Rajmane Rohit Chandrakant	13	PASS	15	PASS
1713017	Sayyad Aafrin Imrahim	9	FAIL	19	PASS
1713018	Nalbhosale Vivekanand Yashwant	14	PASS	19	PASS
1713019	Karpe Ankita Yshwant	7	FAIL	10	PASS

Total Number of Students :	43	43
Total Number of Students Appeared:	42	42
Total Number of Students Passed:	30	35
Total Number of Students Failed:	12	7
Result in Percentage :	**71.43**	**83.33**



Prepared by

(Prof. Jadhav Y. G.)

Kale
HOD

Head of Department
First Year Engineering
Shri Chh. Shivajiraje College
Dhangawadi, Pune-412

Rajgad Dnyanpeeth's Shri Chhatrapati Shivajiraje College of Engg. DTE:6024 SPPU:4071 Dhangawadi Pune 412208

Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engineering
S. No. 237, Dhangawadi, Tal- Bhor, Dist- Pune

Department of Computer Engineering

Assignment Schedule

Subject: Data Structure and Algorithms (2015 Pat.) **Date:** 23rd June 2017

All the students of S.E computer are hereby informed that after completions of unit syllabus submit assignments are as per following schedule.

Assignment No	Unit Name	Given Date	Submission Date
1	Introduction to Algorithm and Data Structures	28/6/2017	3/7/2017
2	Linear Data Structures using sequential organization	14/7/2017	20/7/2017
3	Linked List	27/7/2017	7/8/2017
4	Stacks	18/8/2017	4/9/2017
5	Queues	13/9/2017	25/9/2017
6	Sorting and Searching	28/9/2017	6/10/2017

Subject Incharge

Prof.A.S.Sondkar

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Dept.

HOD

Prof.M.B.Wagh

5.ASSIGNMENTS FOR SLOW LEARNERS

RajgadDnyanpeeth's

RAJGAD DNYANPEETH TECHNICAL CAMPUS

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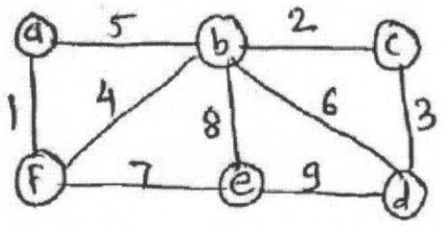
S. No. 237, Dhangawadi, Tal- Bhor, Dist- Pune

Department of Computer Engineering

Assignment No : 1

Syllabus: Unit 1 **Date: 28/6/2017**

Q.No	QUESTION
1	Explain greedy strategy with suitable example suitable example
2	Find Minimum spanning tree for the following graph using Prims algorithm 
3	Define and explain following terms: 1. Linear Data Structure 2. Non-Linear Data Structure 3. Time Complexity 4. Space Complexity
4	Prove the following : 1. If $f(x) = 2x^2+2$ then $f(x) \in O(x^2)$ $f(x) = 5x^3+2x^2+3$ then $F(x) \in (x^3)$
5	Explain Asymptotic Notation Big Omega and theta with suitable example
6	Define and explain following terms 1. Data Structure 2. ADT 3. Algorithm
7	Derive address calculation formula for one-dimensional array with one example.

8	Find the frequency count for the following code.
	`For(i=n-1;i>0;i --)`
	`For(j=0; j<i; j++)`
	`If (a[i]<a[i+1])`
	`{`
	`Temp=a[i];`
	`a[i]=a[i+1];`
	`a[i+1]=temp;`
	`}`

9	Show that $F(x) = O(x^3)$ if function f(x) is defined as $f(x) = 5x^3+6x^2+1$
10	Explain divide and conquer strategy with example.Also comment on the time analysis.

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Subject Incharge

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Assignment No : 2

Syllabus: Unit 2 **Date: 14/7/2017**

Q.No	QUESTION
1	Give pseudo c/c++ code to perform following operations 1.concatinate 2.palindrome 3.Reverse 4.Length
2	Explain Fast transpose of sparse matrix with suitable example.Discuss time complexity.
3	Explain Polynomial representation using arrays with suitable example.
4	Give pseudo c/c++ code to perform following operations 1.concatinate 2.palindrome
5	Explain Fast transpose of sparse matrix with suitable example.Discuss time complexity.
6	Write c/c++ code to perform polynomial multiplication using array
7	Derive address calculation formula for two dimensional array with suitable example.
8	Write c/c++ Pseudo code for sparse matrix addition.
9	Write short note on "Use of sparse matrix in social media and map"
10	Write Pseudo code to perform following operations on 1-D array. 1.Deletei^{th} element 2.Insert x in i^{th} position

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Prof.A.S.Sondkar

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Assignment No : 3

Syllabus: Unit 3 **Date: 27/7/2017**

Q.NO	QUESTION
1	Write a pseudo c/c++ program to delete intermediate node from singly linked list.
2	Explain generalized linked list with example.
3	Write a pseudo c code to reverse single linked list.
4	Write an algorithm to delete intermediate code from doubly linked list
5	Represent the following polynomial by using generalized linked list (a , b (c , d (e, g) , h) (f))

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Assignment No : 4

Syllabus: Unit 4 **Date: 18/8/2017**

Q.No	QUESTION
1	What is stack? Write ADT for stack.
2	What is recursion? Explain use of stack in recursion.
3	Explain stepwise conversion using stack for the given infix expression to the postfix expression. A * (B + C) * D
4	Convert following prefix expression to postfix. +a – bc/-de ^ -fgh
5	Write an algorithm to convert infix expression into postfix.
6	Write an algorithm for postfix expression evaluation with suitable example

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Department of Computer Engineering

Assignment No : 5

Syllabus: Unit 5 **Date: 13/9/2017**

Q.No	QUESTION
1	Define following terms with suitable example 1.Dequeue 2.Priority Queue 3.Linear Queue
2	Write pseudo c/c++ code to implement circular queue using array
3	Explain linear queue and circular queue with suitable example.Explain advantages of circular queue over linear queue.
4	Explain priority queue. Give pseudo code for array implementation of priority queue.
5	Write pseudo c/c++ code to represent queue as ADT.
6	Write pseudo c/c++ code to implement circular queue using linked list.

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Assignment No : 6

Syllabus: Unit 6 **Date: 28/9/2017**

Q.NO	QUESTION
1	Explain quick sort. Sort given list with quick sort: quick sort. Sort given list with quick sort: 30 ,09 ,81, 45 ,90, 27 ,72 ,18
2	Write an algorithm for binary search.Derivee recurrence relation and find out time complexity of the search
3	Explain heap sort and sort the given list using heap sort: 08,03,02,11,05,14,00,02,09,04,20
4	Write short note on stability of sorting.Compare bubble sort,Insertion sort and selection sort with one example and discuss time complexity.
5	Sort the following numbers using merge Sort. 55, 85 ,45 ,11 ,34 ,05 ,89 ,99 ,67 Discuss time and space complexity for the same.
6	Explain sequential and binary search with appropriate example and compare their time complexity and space complexity

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Subject Incharge

Prof.A.S.Sondkar

SE COMP
R NO: 21

Page: 01
Date: / /

Assignment No: 01

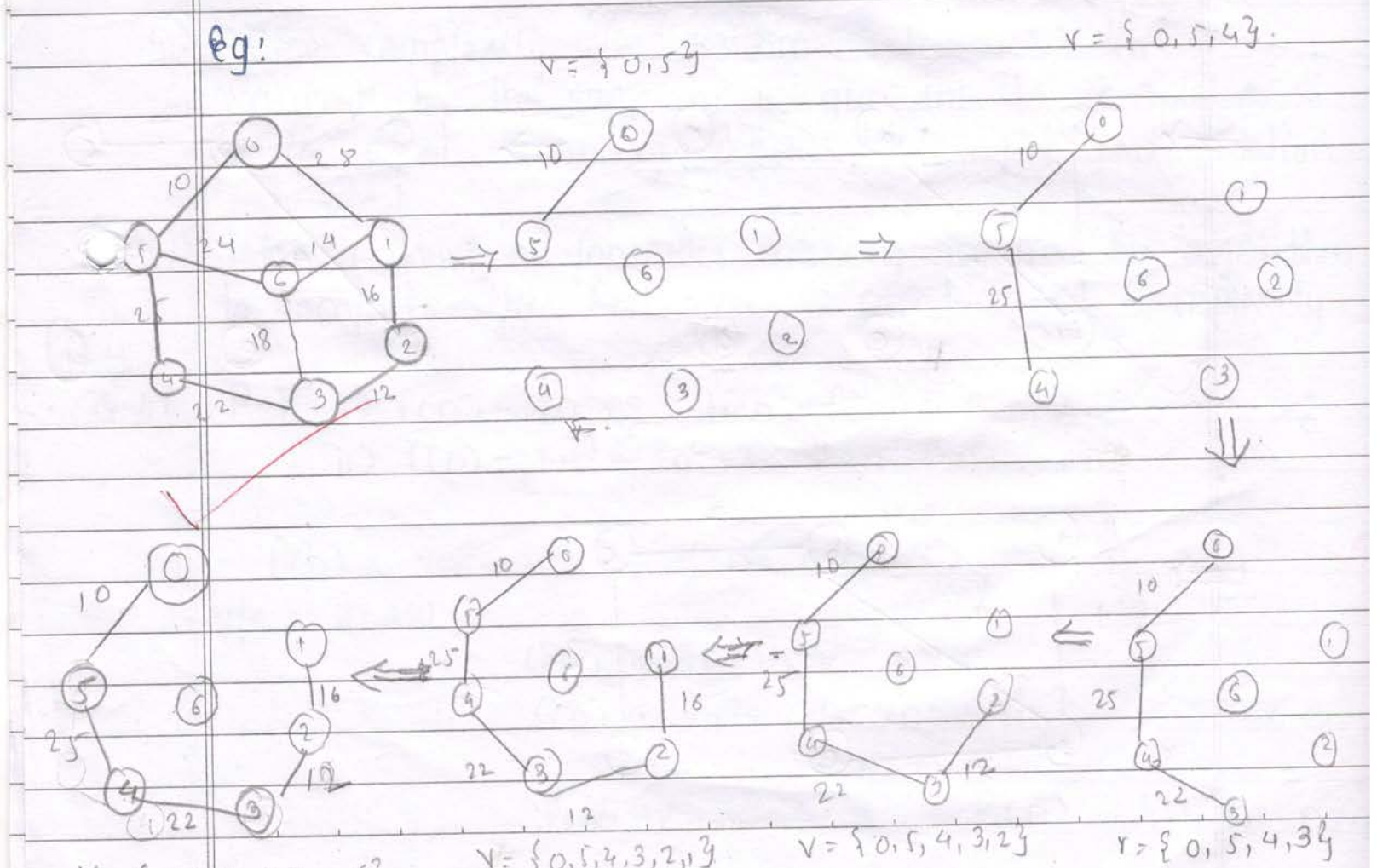
1) Explain Greedy strategy with suitable example.

→

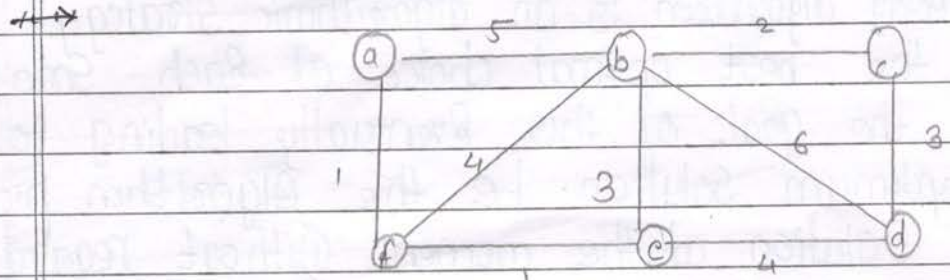
A Greedy algorithm is an algorithmic strategy that makes the best optimal choice at each small stage with the goal of this eventually leading to a globally optimum solution. i.e the Algorithm picks the best solution at the moment without regard for consequences.

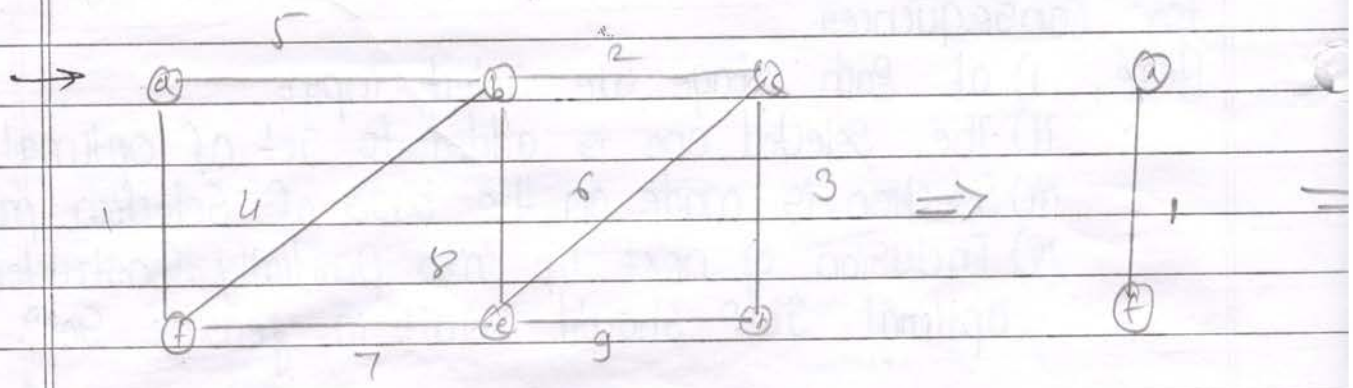
Here, i) at each stage we select input
ii) The selected one is added to set of optimal soln.
iii) Selection is made on the basis of selection procedure
iv) Inclusion of next i/p into partially constructed optimal soln should result in feasible soln.

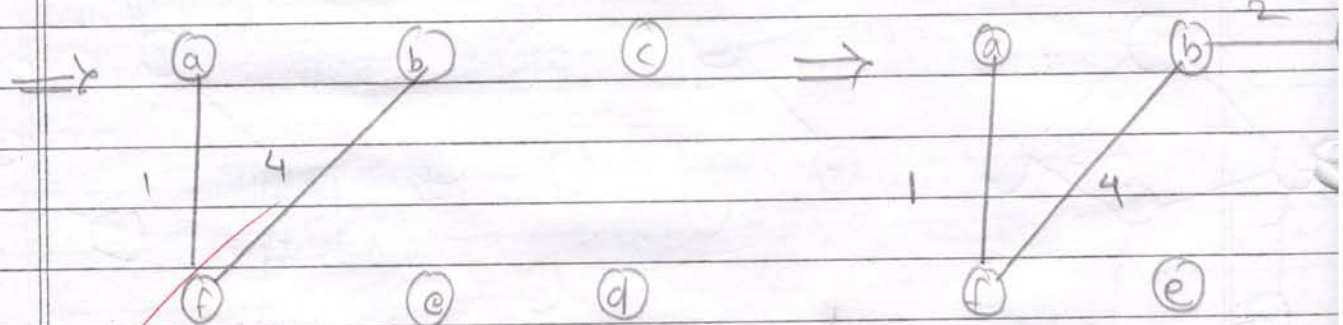
Eg:

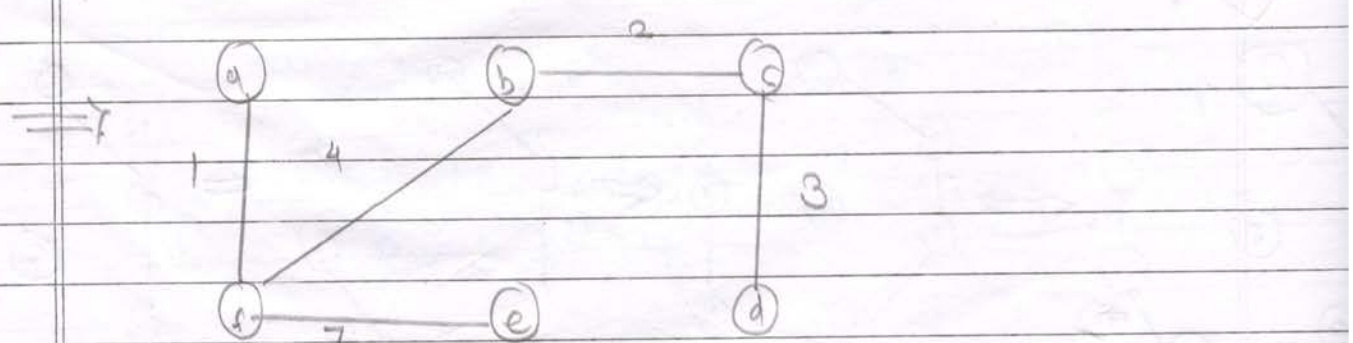


Ex 2] Minimum spanning tree for following Graph using prisms algorithm find :









3] Define & Explain following terms :
i) Linear Data Structure
ii) Non-Linear Data Structure
iii) Time Complexity
iv) Space Complexity

→

ii) Non-Linear data structure are data structure in which data is arranged in hierarchical manner.
Eg: trees, graphs

i) Linear data structures are data structure in which data is arrange in list or sequential manner.
Eg: Array list

iii) Time Complexity of Algorithm is the total time required by the program to run till its completion & it is most commonly expressed using big-oh notation.

iv) Total Amount of Computer memory required by algorithm to complete its Execution is called Space Complexity.

Q.4] P.T i) $f(n) = 2n^2+2$ then $f(n) \in O(n^2)$
ii) $f(n) = 5n^3 + 2n^2+3$ then $f(n) \in (n^3)$.

→

i) $f(n) = 2n^2+2$; $f(n) \in O(n^2)$

We know,

$$f(n) \leq g(n) \quad \forall \quad n \geq k$$

if $f(n) = 2n^2+2 \leq 2n^2 + 2n^2$

Or

$f(n) = 2n^2+2$ & $f(n) \leq 4n^2$ for $n \geq 1$

$\therefore c = 4$ & $K = 1$

$f(n) \leq n^2$ for all $n \geq K$

Hence,

$f(n) \in O(n^2)$

ii) $f(n) = 5n^3 + 2n^2 + 3$; $f(n) \in n^3$

$f(n) = 5n^3 + 2n^2 + 3 \leq 5n^3 + 2n^3 + 3n^3$

$\forall\ n \geq 1$

or $f(n) \leq 10n^3 \ \forall\ n \geq 1$

$\therefore$ Replacing n by highest degree term n^3.

$\therefore c = 12$ $\therefore K = 1$

$f(n) \leq cn^3 \ \forall\ n \geq K$

Hence $f(n) \in n^3$.

5] Explain Asymptotic notation Big Omega & Theta with Suitable Example.

→

Big oh Notation :

1) This (O) provides asymptatic upper bound for given fun^n
2) This fun^n $f(n)$ is said to be [O $g(n)$] if their exist two desi positive equal number.

$f(n) \leq g(n) \ \forall\ n \geq K$

Eg : if $f(n) = 2n^3 + 3n^2 + 1$

then $f(n) = 6x^3$

$f(n) \leq cx^3 \ \forall\ n \geq K$

where $c = 6$ & $K = 1$

$2n^3 + 3n^2 + 1 = 0$

Omega : This notation omega(Ω) provides asympotic lower bound for given function.

This function i.e the (Ω) ; the notation omega (Ω) provides is said to be $\Omega\, g(n)$ if their consist two +ve real numbers $f(n) \geq g(n)$ all $n \geq k$.

show details with graph.

Eg: if $f(n) = 2n^3 + 3n^2 + 1$

then,

$f(n) \geq cn^3 \quad \forall \quad n \geq 1 \rightarrow c = 1$

$\therefore 2n^3 + 3n^2 + 1 = \Omega(n^2)$

6] Define following terms : i) Data structure
ii) ADI
iii) Algorithm

→

i) It is a way of organizing large amount of data more efficiency so that any operation on the data becomes easy

Data structure is formally defined to be a triplet (D, F, A)

Where, D = Set of Domain
F = Set of Operation
A = Onions defining the fun^n

ii) ADI :

ADI is abstract data type, the concept abstraction is commonly found in CS.

It is specification of logical & mathematical properties of data type or structure where as it act a useful guideline to Implement data type.

iii) Algorithm:

Write example

Algorithm is nothing but set of steps required to solve a problem.

An Algorithm is define as it is a sequence & unambiguous instruction used for solving a problem which can be Implement on Computer.

7] Derive Address Calculation formula for 2D Array with Example.

→

2D array with address calculation:

An mxn matrix where the row index varies from 1 to m & column index varies from 1 to n written as,

$$a = \begin{vmatrix} a_{11} & a_{13} \cdots & in \\ a_{21} & a_{22} \cdots & a_{2n} \\ \vdots & \vdots & \\ a_{m1} & a_{m2} \cdots & a_{mn} \end{vmatrix}$$

i) Denotes the entry in i^{th} row & i^{th} col. In comp memory all elements are stored linearly using configures address.

In computer memory matrices use stored in either row major form & column major fun^n.

Row major form - Elements store rowsie
i.e row1, row2 etc.
Column major form - Elements store column wise
i.e column1, column2 etc.

Address formula for column major form
$= B + (j - L_2) \times (r_1 - b_1 + 1) \times 5 + (i - L_1) \times 5$ Location
$= 100 + (1-0) \times (2-0+1) \times 2 + (2-0) \times 2$
$= 100 + 6 + 4$
$= 110$

Elements	a_{00}	a_{10}	a_{20}	a_{31}	a_{11}	a_{21}	a_{02}	a_{22}	a_{03}	a_{13}	a_{23}	a_{22}
location	100	102	104	106	108	110	112	114	116	118	120	122

10] Explain Divide & conquer strategy with Example. Also Comment on time analysis.

→

Divide & conquer algorithm works by recursively breaking down a problem into two or more sub-problem of same or related type.

Divide, the given problem divide into smaller indepen subproblems as the same type as given problem is small enough then solve it.

Conquer if the problem is small enough then solve it.

Divide & Conquer Algorithm; merge sort (arr[], l, r)

```
{
  if (r>l)
  {
    1 middle m = (l+r)/2 ;
    2 Call merge sort (arr, m&l, r);
    3 Call merge sort (arr, m+1, r);
    4 merge (arr, l, m, r);
  }
}
```

Explain merge sort with example

9] ST $f(x) = O(x^3)$ if $f(x)$ is defined as $f(x) = 5x^3 + 6x^2 + 1$

$\Rightarrow$

$f(x) = 5x^3 + 6x^2 + 1 \leq 5x^3 + 6x^3 + 1x^3$

$\forall \; x \geq 1$ or $f(x) \leq 12x^3$ for $x \geq 1$

$\exists \; C = 12$ & $K = 1$ such that

$f(x) \leq Cx^3 \; \forall \; x \geq K$

Hence $f(x)$ is $O(x^3)$.

18/10

Toulton 5/7/2017

Kagade Pooja Santos

Assignment No : 1

Roll No: 36
S.E Comp

Page:
Date: 6/7/2017

1] Explain greedy strategy with suitable example

→ The greedy method is a very simple techniqu and it can be applied to wide variety of problem. Greedy algorithms work in phases in each phase, a decision is made that appears to be good, without regard for future consequens

- At each stage, we select an input
- Input selected is added to the set of optim solution.
- selection is made on the basis of selection procedure.
- Inclusion of next input into the partially constructed optimal solutions should result in feasible solution

Knapsack Problem

we will first explain the knapsack problem and then see how it can be solved using greedy approach

we are given on objects and knapsack

- Each object is of fixed weight.
- knapsack has a capacity m
- There are different types of objects.
- Each type of object gives us certain profit.

objective

Fill the knapsack with suitable objects to maxim ze the profit.

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Constraint

Total weight of objects $\leq m$

Formally, the problem can be stated as

- object i has a weight w_i and it gives a profi of p_i
- A fraction x_i $(1 \geq x_i \geq 0)$ of object i is used to fi the knapsack.
- Thus,

objective is to maximize $\sum_{i=1}^{n} p_i x_i$

with the constraint $\sum_{i=1}^{n} w_i x_i \leq m$

Greedy Approach

1] Select object that gives maximum profit per unit weight. i.e select the object with largest value of p_i/w_i

2] Use the object for filling up of knapsack. Now one of the two things can happen

- knapsack is filled to its complete capacity
- object i is exhausted and some more objects can be added to knapsack.

Example

Consider the following example of knapsack

There are three types of objects, $n = 3$

Capacity of knapsack $m = 20$

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profit due to objects = (25, 24, 15)
(profit due to object 1 = 25
profit due to object 2 = 24
profit due to object 3 = 15)
weights of objects = (18, 15, 10)
Calculating profit per unit weight

$i = 1, \frac{25}{18}$ $i = 2, \frac{24}{15}$ $i = 3, \frac{15}{10}$

Here $\frac{24}{15} > \frac{15}{10} > \frac{25}{18}$

step 1: Select the object 2 for filling the knapsa
$x_2 = 1$ (All objects of type 2 will be used for filli
the knapsack)
Capacity remaining after filling of object of type
$2 = 20 - 15 = 5$.

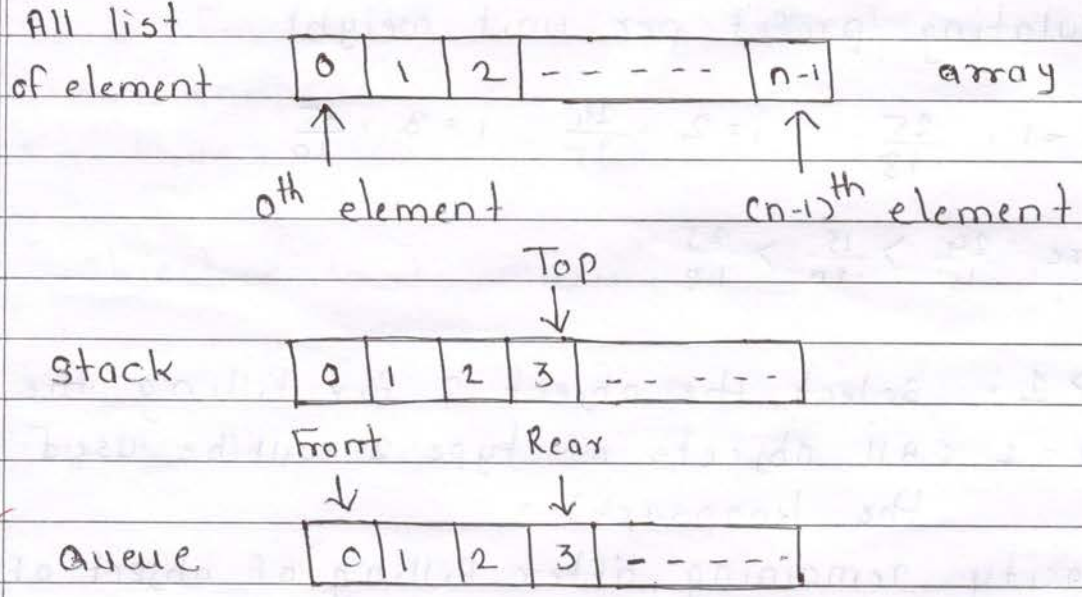
step 2: Select 1/2 of objects of type 3 to fill the knapsack. $\therefore x_3 = 1/2$

step 3: Since, the knapsack is filled to its complet
capacity: $x_1 = 0$
$\therefore$ Total profit $= 0 \times 25 + 1 \times 24 + 1/2 \times 15 = 24 + 7.5 = 31.5$

2] Explain following terms.
→ i] Linear data structure
Elements are arranged in linear fashion.
All one-one relation can be handled through linear data structure.

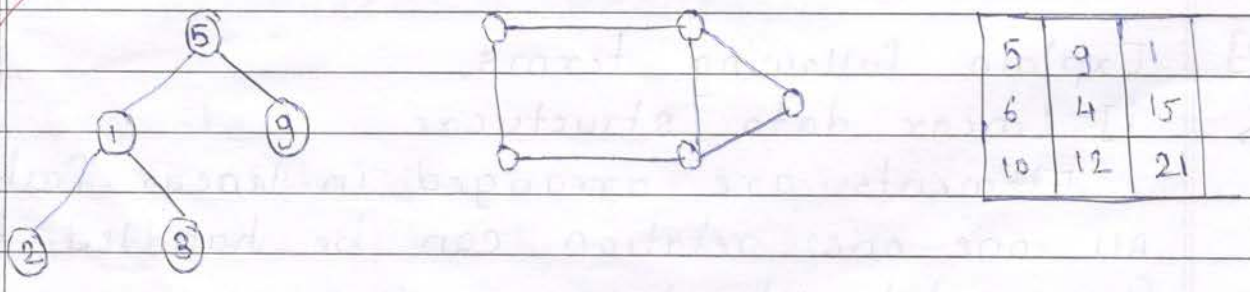
Lists, stacks and queues are example of linea data structure.

Representation of linear data structures in an array.



Non linear.

- All one-many, many-one or many-many relations are handled through non-linear data structures. Every data element can have a number of predecessors as well as successors. Tree graphs and tables are example of non-linear data structures.



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iii] Time Complexity

When we write a program to be used a fe times, goal 1 is most important. Cost of writin the program will have an upper hand over the cost of running the program, when the progra is to be used many times, the cost of running the program and hence the goal 2 should be given more weightage

iv] Space complexity

Space requirement means the space require to store input data either static or dynamic. Space required on top of the system stack to handle recursion call should also be Considered. Computing time.

3] Explain Asymptotic Notation Big omega and theta with suitable example

→ This provides asymptotic lower bound for a given function. A function f(x) is said to be $\Omega(g(x))$ if there exist two positive integer/ real number constants c and k such that

$f(x) \geq c\,(g(x))$ whenever $x \geq k$

Example :

if $f(x) = 2x^3 + 3x^2 + 1$

then $f(x) \geq c\,x^3$ for all $x \geq 1$, $c = 1$

$\therefore 2x^3 + 3x^2 + 1 = \Omega(x^3)$

Theta notation

This provides simultaneously both asymptotic upper bound and asymptotic lower bound for a given function.

A function $f(x)$ is said to be $\Theta(g(x))$ if, there exist positive constants c_1, c_2 and k such that

$c_2 g(x) \leq f(x) \leq c_1 g(x)$ for all $x \geq k$

Example

For any two function $f(x)$ and $g(x)$, $f(x) = \Theta(g(x))$ If and only if $f(x) = O(g(x))$ and $f(x) = \Omega(g(x))$

4] Define and explain following term

→ 1] Data Structure

- A data structure is merely an instance of an ADT.
- An ADT or data structure is formally defined to be a triplet (D, F, A) where "D" stands for set of Domains "F" denotes the set of operations and "A" represents the axioms defining the functions in "F".
- An example of the data structure "Natural Number (NATNO)".

2] Abstract Data Types

The concept of abstraction is commonly found in computer science. A big program is never written as a monolithic piece of program, instead it is broken down in smaller modules and each

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module is developed independently.

ADT for an array

Arrays are stored in consecutives set of memory locations. An array can be thought of a set of pair, index and value.
There are two operations permitted on 'ARRAY' data structure. These two operations are retrieve and store.
ADT ARRAY can be declared as below:

structure ARRAY (value, index)
declare

CREATE () → array
RETRIVE (array, index) → value
STORE (array, index, value) → array.

The function CREATE () produces an empty array. The function RETRIVE () takes as input an array and an index, and either returns the appropriate value or an error.

Algorithm

An algorithm is a set of steps required to solved a problem. These steps are performed on a sample data representing an instance of the problem. Thus an algorithm maps a set of input data to a set of output data through

a sequence of operations. An algorithm must have the following properties :

1] Input : Input data supplied externally (zero or more).

2] Output : Result of the program.

3] Finiteness : In every case, algorithm terminates after a finite number of steps.

4] Definiteness : The steps should be clear and unambiguous

5] Effectiveness : An algorithm should be written using basic instructions. It should be feasible to convert the algorithm in a computer program.

5] Derive address calculation formula for one-dimensional array with one example.

→ An m x n matrix (A [1...m] [1...n]) where the row index varies from 1 to m and column index varies from 1 to n can be written as

$$a = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & & & \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix}$$

a_{ij} denotes the entry in the i^{th} row and j^{th} column. In computer memory, all elements

are stored linearly using contiguous addresses. Hence, in order to store a two diamensional matrix a two diamensional address space must be mapped to one diamensional (linear) address space.

In the Computer's memory metrices are stor in either row major form or column major for

Mapping of a two diamensional (3×4) array

[0][0] [0][1] [0][2] [0][3]	0	1	2	3	0	3	6	9
[1][0] [1][1] [1][2] [1][3]	4	5	6	7	1	4	7	10
[2][0] [2][1] [2][2] [2][3]	8	9	10	11	2	5	8	11
Arrangment of indices	Row major				Column ma			

Location of an element Aij (row major form)

= B + (i-l1) x (u2-l2+1) x s + (j-l2) x s

B - Base address

u2 - l2 + 1 - Number of column, i.e no. of element in each row

S - Number of bytes taken to store each element (an integer requires 2 bytes of memory)

(i-l1) x (u2-l2+1) x s - ith row will start after i-l1 rows, each row has u2-l2+1 elements and the size of each element in s bytes.

- Application of above formula for an array declared in C-program.

int a[3][4]

Let the array in stored in memory at a base

location 100. Let each element be stored in memory using $S = 2$ bytes

lower bound $l_1 = 0$] row
upper bound $u_1 = 2$]
lower bound $l_2 = 0$] column.
upper bound $u_2 = 3$]

location of [2][1]

$= 100 + (2-0) \times (3-0+1) \times 2 + (1-0) \times 2 = 100 + 16 + 2 = 118$

Elements	a_{00}	a_{01}	a_{02}	a_{03}	a_{10}	a_{11}	a_{12}	a_{13}	a_{20}	a_{21}	a_{22}	a_{23}
Locations	100	102	104	106	108	110	112	114	116	118	120	122

Elements stored in contiguous memory locations in row major forms.

location of an element a_{ij} (column major form)

$= B + (j - l_2) \times (u_1 - l_1 + 1) \times S + (i - l_1) \times S$

location of [2][1]

$= 100 + (1-0) \times (2-0+1) \times 2 + (2-0) \times 2 = 100 + 6 + 4 = 110$

Elements	a_{00}	a_{10}	a_{20}	a_{01}	a_{11}	a_{21}	a_{02}	a_{12}	a_{22}	a_{03}	a_{13}	a_{23}
Locations	100	102	104	106	108	110	112	114	116	118	120	122

6] Find the frequency count for the following code.

→

```
For (i=n; i>0; i--)
  for (j=0; j<i; j++)
    if (a[i] < a[i+1])
      {
```

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```
temp = a[i];
a[i] = a[i+1];
a[i+1] = temp;
}
```

Frequent cast ?

7] Show that $F(x) = O(x^3)$ if Function $f(x)$ is defined as $F(x) = 5x^3 + 6x^2 + 1$

→

If $F(x) = 5x^3 + 6x^2 + 1$

$F(x) \leq 5x^3 + 6x^3 + 3$

$\leq 12x^3$

$5x^3 + 6x^2 + 1 = O(x^3)$ as

$F(x) \leq C \cdot x^3$ for all $x \geq k$ where

$C = 12$ and $k = 1$

8] Explain divide and conquer strategy with example

→ In divide and conquer strategy, we split a problem into subproblem. sub problem resulting from divide and conquer are of the same type as the original problem. These sub problems are solved recursively. Recursion will eventually terminate when the sub problem to be solved is small enough to be solved without further

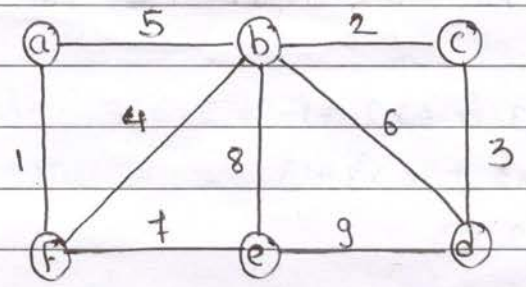
splitting. Now there must be a method to com-ne sub solutions into a solution of the whole. Thus divide and conquer algorithm consists of two parts:

1] Divide: Smaller problems are solved recursively.

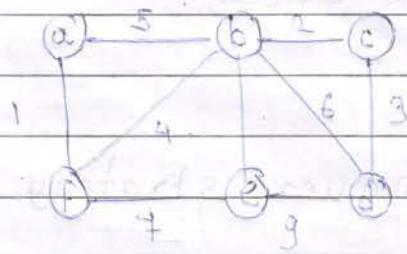
2] The solution to the original problem is then formed form the solutions to the sub problems.

Explain with suitable example

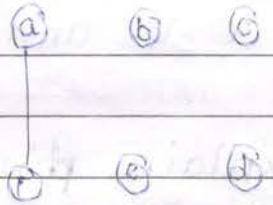
9] 8" Find minimum spanning tree for the follow-ing graph using prims algorithm.



→ step 1: Initial graph

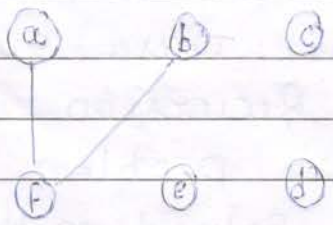


step 2: Choose minimum wt edge



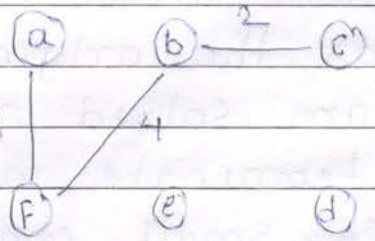
V = { a, F }

step 3:



V = { a, F, b }

step 4:



V = { a, F, b, c }

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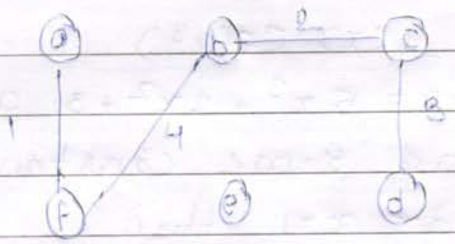
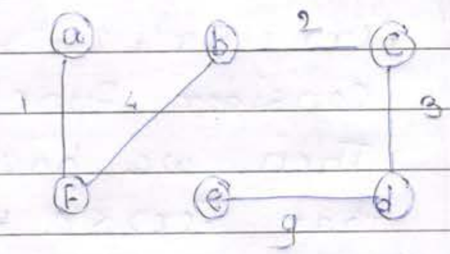
step 5:



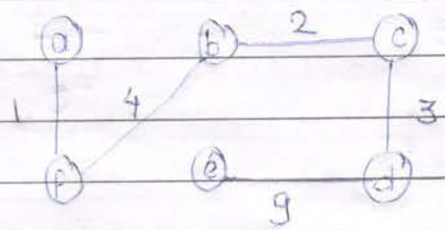
V = {a, f, b, c, d}

step 6:



V = {a, f, b, c, d, e}

step 7: Final minimum spanning tree



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6/7/2017

Kagade Pooja Santosh

Assignment No : 2

Roll No. 36
S.E Comp

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1] Give pseudo c/c++ code to perform following operations.

→ 1] Concatinate

```
# include <stdio.h>
# include <string.h>
void Concatinate (char [], char []);
void main()
{
    char s1[50], s2[30];
    pf ("\n Enter two strings : ");
    gets (s1);
    gets (s2);
    Concatenate (s1, s2);
    pf ("\n final string is : %s", s1);
    getch();
}
void Concatinate (char s1[], char s2[])
{
    int i, j;
    i = strlen (s1);
    For (j=0; s2[j] != '\0'; i++, j++)
        s1[i] = s2[j];
    s2[i] = '\0';
}
```

Write Pseudo-code with program.

2] palindrome

```
int palindrome (char a[i])
{
```

```
int i=0, j;
j= strlen(a) -1;
while (i<j)
 {
   if (a[i] != a[j])
    return(0);
  i++; j--;
 }
 return (1);
}
```

3] Reverse

```
#include <stdio.h>
#include <string.h>
void main()
 {
   char s[100], temp;
   int i, j=0;
   pf("\n Enter the string : ");
    gets(s);
   i=0
   j= strlen(s)-1;
   while (i<j)
  {
     temp =s[i];
     s[i]= s[j];
     s[j] = temp;
     i++; j--;
  }
```

```
printf ("\n Reverse string is : %s", s);
getch();
}
```

4] Length of string

```
# include <stdio.h>
# include <conio.h>
void main()
{
    char s[100];
    int l;
    printf ("\n Enter the string : ");
    gets(s);
    l=0;
    while (s[l]!='\0')
    l++;
    printf ("\n length of %s is = %d", s, l);
    getch();
}
```

2] Explain Fast transpose of sparse matrix with suitable example. Discuss time Complexit

→ 1] It is another algorithm with much better timming behaviour.

2] Number elements in each column of "B1[]" is determined first. This gives number of elements in each row of "B2[]".

3] From the above information, the starting plo

of each row in

```
Void fast_transpose (int B1[MAX][3] ,int B2[MA
                                    [3])
{
    int m,n,t,i, col_num, location;
    int total[MAX], index[MAX];
    m = B1[0][0]; n = B1[0][1]; t = B1[0][2];
    B2[0][0] = n; B2[0][1] = m; B2[0][2] = t;
    for(i=0; i<n; i++)
      total[i] = 0;
    for(i=1; i<=t; i++)
    {
      col_num = B1[i][1];
      total[col_num]++;
    }
    index[0] = 1;
    for(i=1; i<n; i++)
    index[i] = index[i-1] + total[i-1];

    for(i=1; i<=t; i++)
    {
        col_num = B1[i][1];
        location = index[col_num];
        index[col_num]++;
        B2[location][0] = B1[i][1];
        B2[location][1] = B1[i][0];
        B2[location][2] = B1[i][2];
    }
}
```

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3] Explain polynomial representation using arrays with suitable example.

→ Suppose, we have a polynomial:

$$C_{m-1}x^{m-1} + C_{m-2}x^{m-2} + \cdots + C_0x^0$$

and it is to be represented in an array.

Some of the coefficients C_i in above polynomial could be zero. We will store terms with non zero coefficients. Let us suppose that the polynomial has n non-zero terms.

polynomial in (1), with n terms can be represented by the ordered list of length 2n+1;

$$(n, \underbrace{(\text{power}, \text{coefficient})}_{1^{st}\text{ term}}, \underbrace{(\text{power}, \text{coefficient})}_{2^{nd}\text{ term}}, \ldots)$$

For example, $x^3 + 5x^2 + 9$ can be represented as

(3, (3,1), (2,5), (0,9))

0	1	2	3	4	5	6
3	3	1	2	5	0	9

in an array

4] Give pseudo c/c++ code to perform following operations.

→ i] Concatinate

```
#include <stdio.h>
#include <string.h>
void Concatenate (char [], char []);
void main ()
```

```
{
    chare s1[50], s2[30];
    printf("\n Enter two strings: ");
    gets(s1);
    gets(s2);
    Concatenate(s1, s2);
    printf("\n Final string is : %s", s1);
    getch();
}
void Concatenate(char s1[], char s2[])
{
    int i, j;
    i = strlen(s1);
    for(j=0; s2[j] != '\0'; i++, j++)
    s1[i] = s2[j];
    s1[i] = '\0';
}
```

2] palindrome

```
int palindrome(char a[])
{
    int i=0, j;
    j = strlen(a) - 1;
    while(i<j)
    {
      if(a[i] != a[j])
      return(0);
    i++; j--;
}
```

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return (1);
}

5] Explain fast transponse of sparse matrix with suitable example. Discuss time complexity.

→ - It another algorithm with much better timing behaviour.
- Number of elements in each column of "B1[]" is determined first. This gives number of elements of in each row of "B2[]".
- From the above information, the starting plac of each row in "B2[]" can be calculated exactly.
- There are four loops in FAST-TRANSPOSE, which we executed n, t, n-1 and t times respectively. Hence the order of magnitude of timing complexity is o(n+t). The computing time of o(n+t) becomes o(nm) when t is of the order of nm.

There are two additional arrays, namely index[MAX] and total[MAX]

Space required for original and transposed matrix is of the order of t. Space required for index[] and total[] is of the order of n.

∴ Space required = o(t+2n)

6] Write c|c++ code to perform polynomial multiplication using array.

→ polynomial multiply (Polynomial *P1, Polynomial *P2)

```
{
    polynomial P3 , ptemp;
    term t;
    int i;
    init (&P3)
    for(i=0; i<P2->n; i++)
    {
        init (&ptemp)
        for (j=0; j<P1->n; j++)
        {
            t.power = P1->a[j].power + P2->a[i].power
            t.coeff = P1->a[j].coeff * P2->a[i].coeff
            insert (&Ptemp, t);
        }
        P3 = add (&P3, &ptemp);
    }
    return (P3);
}
```

7] Derive address calculation formula for two diamensional array with suitable example

→ An m x n matrix (A[1...m][1...n]) where the row index varies from 1 to m and column index varies from 1 to n can be written as

$$a = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & & & \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix}$$

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a_{ij} denotes the entry in the i^{th} row and the j^{th} column. In Computer memory all elements are stored linearly using contiguous addresses. Hence, in order to store a two diamensional matrix a, two diamensional address space must be mapped to one diamensional (linear) address space.

Row major form

Elements are stored row wise i.e row 1, row 2, --- row m.

Column major form

Elements are stored column wise i.e column 1, column 2, --- column n

Mapping of a two diamensional (3x4) array

[0][0]	[0][1]	[0][2]	[0][3]	0	1	2	3	0	3	6	9
[1][0]	[1][1]	[1][2]	[1][3]	4	5	6	7	1	4	7	10
[2][0]	[2][1]	[2][2]	[2][3]	8	9	10	11	2	5	8	11
Arrangement of indices				Row major mapping				Column major mapping			

location of an element a_{ij} (row major form):

$= B + (i - L1) \times (U2 - L2 + 1) \times S + (j - L2) \times S$

B - Base address

U2 - L2 + 1 - No. of columns i.e number of elements in each row

S - No. of bytes taken to store each element (an integer requires 2 bytes of

of memory)
(i-L1) x (U2-L2+1) x s - i^{th} row will start after i-L1 rows, each row has U2-L2+1 elements and the size of each element in s bytes.

- Application of above formula for an array declared in C-program.

int a[3][4]

Let the array is stored in memory at a base location 100. Let each element be stored in memory using s = 2 bytes

Lower bound L1 = 0
Upper bound U1 = 2
] row

Lower bound L2 = 0
Upper bound U2 = 3
] column

9] Write short note on "use of sparse matrix in social media and map.

→ In a sparse network, we have less number of links compare to maximum possible no. of links. Sparse matrix is suitable for representation of social networks and maps most of the real networks are sparse.

- In an online social network, edges represent interaction between people.
- In a road network, nodes represent intersections and edges roads connecting the inter

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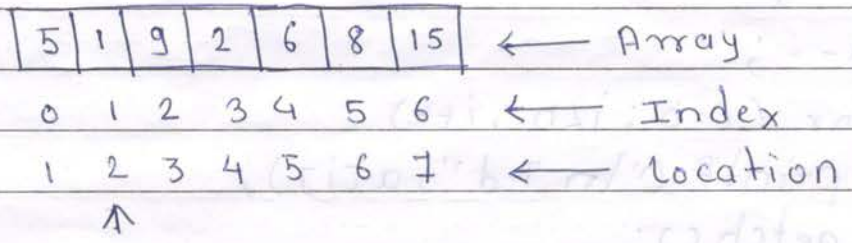
The adjacency matrix of social networks and maps is very sparse. Such an adjacency matrix can be effectively represented using a sparse matrix

10] Write pseudo code to perform following operations on 1-D array.

→ 1. Delete i^{th} element

Deletion involves deleting the specified element from the array.



status of the array after deletion of 2nd eleme

```
# include <stdio.h>
# include <conio.h>
void main ()
{
   int a [30], n, i, j;
  /*
    n - no. of elements stored in array
    i - for scanning the array
    j - location of the element to be deleted
  */
  printf ("\n Enter no of elements :");
  scanf ("%d", &n);
```

```
printf ("\n Enter %d elements:", n);
for (i=0 ; i<n ; i++)
scanf ("%d", &a[i]);
printf ("\n location of the element to be
        deleted :");
scanf ("%d", &j);
while (j<n)
 {
   a[j-1] = a[j];
   j++;
 }
n--;
for (i=0 ; i<n ; i++)
 printf ("\n %d", a[i]);
 getch();
}
```

ii] Insertion

```
# include <stdio.h>
# include <conio.h>
void main()
{
   int a[30], x, n, i, loc;
   printf ("\n Enter no of elements:");
   scanf ("%d", &n);
    for (i=0 ; i<n ; i++)
    scanf ("%d", &a[i]);
   printf ("\n Enter the element to be inserted :")
```

```
scanf ("%d", &x);
printf ("\n Enter the location");
scanf ("%d", &loc);
for (i=n; i>=loc-1; i--)
a[i+1] = a[i]
n++;
a[loc-1] = x
for (i=0; i<n; i++)
  printf ("\n%d", a[i]);
}
```

9/10 Bulkan 21/7/2017

Rajgad Dnyanpeeth's

Shri Chhatrapati Shivajiraje College of Engineering

Department of Computer Engineering

Semester-II A.Y.2017-18

Prerequisites Lecture Attendance Sheet

Class: S.E. **Subject:** Advanced Data Structure

Lecture No.	Contents Covered
1	Revision of Basic data Structures. Array, Stack.
2	Linked List - Operations - Insert, Delete, Display.
3	Revision of Queue operations & revision of pointers.

Roll No.	Name of Student	18/12/2017	19/12/17	20/12/17
1722001	Asabe Mayuri Ashok			
1722002	Bhate Rohan Prasannakumar			
1722003	Bhutkar Aishwarya Raghunandan			
1722004	Damgude Diptee Arun			
1722005	Deshmane Akshata Sanjay			
1722006	Deshmane Manoj Chandrakant		A	
1722007	Devalekar Komal Suresh			
1722008	Dhanawale Sagar Dnyanoba			
1722009	Dhondge Kaustubh Virendra			
1722010	Ghule Ajay Dinkar			
1722011	Kadekar Gausmohammad Innuskhan			
1722012	Khude Ankita Sunil	A		
1722013	Khude Dipali Chhaban			
1722014	Kumbhar Akshay Gurudev			
1722015	Mhasavade Arati Milind			
1722016	More Ajinkya Namdeo			
1722017	Patil Pavan Dhanaji			
1722018	Patil Rupesh Ramesh			
1722019	Pawar Snehal Laxman			
1722020	Pawar Trupti Vikas			
1722021	Pawar Vaishali Sanjay		A	A
1722022	Phadnis Swapnali Sudhir			
1722023	Phase Vishakha Audumbar	A		
1722024	Roman Snehal Ravindra			
1722025	Salekar Rupali Balu			
1722026	Salunke Pragati Sampat			
1722027	Sathe Sunny Somnath		A	A
1722028	Shaikh Tamanna Anwar			
1722029	Shinde Tejaswini Popat			

1722030	Shivankar Ankita Vinayak			
1722031	Surve Ashlesha Devidas			
1722032	Surve Omkar Shashank	A		
1722033	Thakare Priyanka Shashikant			A
1722034	Yadav Krishna Ramdhani			
1722035	Yadav Prajwal Shankar			
1722036	Yadav Tanuja Dnyaneshwar	A		

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Subject Teacher
Prof.A.S.Sondkar

7. PROVISION OF QUESTION PAPER WITH SOLUTION

Total No. of Questions—8] [Total No. of Printed Pages—6

Seat No.	S1507100591

[5559]-110

S.E. (Civil Engg.) (I Sem.) EXAMINATION, 2019

ENGINEERING MATHEMATICS—III

(2015 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. :— (*i*) Neat diagrams must be drawn wherever necessary.

(*ii*) Assume suitable data, if necessary.

(*iii*) Use of non-programmable calculator is allowed.

(*iv*) Answer Q. Nos. 1 *or* 2, Q. Nos. 3 *or* 4, Q. Nos. 5 *or* 6, Q. Nos. 7 *or* 8.

1. (*a*) Solve any *two* of the following : [8]

(*i*) $(D^2 - 4D + 4)\, y = e^{2x} \sin 3x$

(*ii*) $\frac{d^2y}{dx^2} + 4y = \tan 2x$ (by variation of parameters)

(*iii*) $(x+1)^2 \frac{d^2y}{dx^2} + (x+1)\frac{dy}{dx} + y = 2 \sin [\log (x+1)]$

(*b*) Solve the following system of equations by Gauss-Jordan method : [4]

$$x_1 + x_2 + x_3 = 9$$
$$2x_1 - 3x_2 + 4x_3 = 13$$
$$3x_1 + 4x_2 + 5x_3 = 40.$$

Or

2. (*a*) Find the elastic curve of a uniform cantilever beam of length l, having a constant weight w kg per foot and determine the deflection of the free end. [4]

(*b*) Using fourth order Runge-Kutta method, solve the equation $\frac{dy}{dx} = \sqrt{x+y}$ subject to the conditions $x = 0$, $y = 1$ and find y at $x = 0.2$ taking $h = 0.2$. [4]

(*c*) Solve the following system of equations by Cholesky's method : [4]

$$4x_1 - 2x_2 = 0$$
$$-2x_1 + 4x_2 - x_3 = 1$$
$$-x_2 + 4x_3 = 0.$$

3. (*a*) Calculate the first four central moments for the following data : [4]

x	f
1	1
2	6
3	13
4	25
5	30
6	22
7	9
8	5
9	2

(b) If the probability that an individual suffers a bad reaction from a certain injection is 0.001, determine the probability that out of 2000 individuals, more than 2 individuals will suffer a bad reaction. [4]

(c) Find the directional derivative of $\phi = 5x^2y - 5y^2z + 2z^2x$ at the point (1, 1, 1) in the direction of the line : [4]

$$\frac{x-1}{2} = \frac{y-3}{-2} = \frac{z}{1}.$$

Or

4. (a) Prove the following (any *one*) : [4]

(i) $\nabla \cdot \left[r \nabla \left(\frac{1}{r^n} \right) \right] = \frac{n(n-2)}{r^{n+1}}$

(ii) For scalar functions ϕ and ψ show that :

$$\nabla \cdot [\phi \nabla\psi - \psi \nabla\phi] = \phi \nabla^2\psi - \psi \nabla^2\phi.$$

(b) Show that $\bar{F} = (ye^{xy} \cos z)\bar{i} + (xe^{xy} \cos z)\bar{j} - (e^{xy} \sin z)\bar{k}$ is irrotational. Find ϕ such that $\bar{F} = \nabla\phi$. [4]

(c) If $\bar{x} = 8.2$, $\bar{y} = 12.4$, $\sigma_x = 6.2$, $\sigma_y = 20$, $r(x, y) = 0.9$. Find lines of regression. Also estimate the value of x for $y = 10$ and value of y for $x = 10$. [4]

5. Solve any *two* :

(a) Using Green's theorem to evaluate $\int_C (3y\,dx + 2x\,dy)$, where C is boundary $0 \le x \le \pi$, $0 \le y \le \sin x$. [7]

(b) Using Divergence theorem to evaluate

$$\iint_S [(2x + 3z)i - (xz + y)\,j + (y^2 - 2z)k] \cdot \bar{d}S$$

where S is the surface of sphere having center at (3, −1, 2) and radius is 3. [6]

(c) Evaluate $\iint_S (\nabla \times \bar{F}) \cdot \bar{d}S$ for the surface of paraboloid $z = 4 - x^2 - y^2$, $z \ge 0$ and $\bar{F} = y^2i + zj + xyk$. [6]

Or

6. Solve any *two* :

(a) Find the workdone in moving a particle along the curve $\bar{r} = a \cos\theta i + a \sin\theta j + b\theta k$ from $\theta = \frac{\pi}{4}$ to $\theta = \frac{\pi}{2}$ under the force field is given by : [7]

$$\bar{F} = (-3a \sin^2\theta \cdot \cos\theta)\,i + a(2 \sin\theta - 3 \sin^3\theta)j + b \cdot \sin 2\theta k.$$

(b) Show that : [6]

$$\int_C [\bar{u} \times (\bar{r} \times \bar{v})] \cdot \bar{d}r = -(\bar{u} \times \bar{v}) \cdot \iint_S dS$$

Where S is the open surface bounded by curve 'C' and $\bar{u}, \bar{v}$ are constant vectors.

(c) Using Divergence theorem to show that : [6]

$$\iint_S \bar{r} \cdot \bar{n}\,dS = 3V$$

where V is the volume enclosed by 'S'.

alternate method

10 set

Total No. of Questions : 8]

[Total No. of Pages : 15

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S.E. (Civil)

ENGINEERING MATHS - III

(2015 Pattern) (Semester - I)

Solution & Sheme of Marking

1(a)(i) A.E: $D^2 - 4D + 4 = 0 \Rightarrow D = 2, 2$

$\Rightarrow \boxed{Y_C = (C_1 x + C_2) e^{2x}}$ ——— 1M

$$Y_P = e^{2x} \frac{1}{(D+2)^2 - 4(D+2) + 4} \sin 3x$$

$$= e^{2x} \frac{1}{D^2} \sin 3x$$

$\boxed{Y_P = \frac{-1}{9} e^{2x} \sin 3x}$ ——— 3M

(ii) A.E: $D^2 + 4 = 0 \Rightarrow D = \pm 2i$

$\Rightarrow \boxed{Y_C = C_1 \cos 2x + C_2 \sin 2x}$ ——— 1M

$$\begin{vmatrix} \cos 2x & \sin 2x \\ -2\sin 2x & 2\cos 2x \end{vmatrix} = 4$$

$u = \frac{1}{4} [\sin 2x - \log(\sec 2x + \tan 2x)]$ ——— 1M

$v = \frac{-1}{4} \cos 2x$ ——— 1M

$\boxed{Y_P = \frac{-1}{4} \cos 2x \log(\sec 2x + \tan 2x)}$ ——— 2M 1M

(iii) Legendre's LDE

$\therefore$ Put $x + 1 = e^z \Rightarrow z = \log(x+1)$

LDE becomes : $(D^2 + 1) Y = 2 \sin z$

$D = \pm i \quad \therefore \boxed{Y_C = C_1 \cos z + C_2 \sin z}$ ——— 2M

$\boxed{Y_P = -z \cos z}$ ——— 2M

P.T.O.

Note: Due credit should be given if Q1(a) (i) & (iii) Solved by Variation of Parameter Method

Q1 (b) Eliminate x_1 from second & third eq^{n}s using first equation. $[R_2 - 2R_1, R_3 - 3R_1]$:

$$x_1 + x_2 + x_3 = 9$$
$$-5x_2 + 2x_3 = -5$$
$$x_2 + 2x_3 = 13$$

] 1M

Eliminate x_2 from first and third eq^{n}s using second equation. $\left[R_1 + \frac{1}{5}R_2, R_3 + \frac{1}{5}R_2\right]$:

$$x_1 + \frac{7}{5}x_3 = 8$$
$$-5x_2 + 2x_3 = -5$$
$$\frac{12}{5}x_3 = 12$$

] 2M

Eliminate x_3 from first and second eq^{n}s using third equation. $\left[R_1 - \frac{7}{12}R_3, R_2 - \frac{5}{6}R_3\right]$

$$x_1 + 0x_2 + 0x_3 = 1$$
$$0x_1 - 5x_2 + 0x_3 = -15$$
$$0x_1 + 0x_2 + \frac{12}{5}x_3 = 12$$

Which implies that

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \\ 5 \end{bmatrix}$$ ⟶ 1M

P.T.O. (ii)

To RHS of P the downward force $W(l-x)$, produces a positive moment given by:

$$M(x) = W(l-x)\left(\frac{l-x}{2}\right) = \frac{W}{2}(l-x)^2.$$

Hence,

DE: $$EI\frac{d^2y}{dx^2} = \frac{W}{2}(l-x)^2 \quad -(I)$$ ——— 1M

Conditions: $y = \frac{dy}{dx} = 0$ at $x=0$

solving (I) and using boundary conditions,

we get $$\boxed{y = \frac{W}{24EI}\left[x^4 - 4lx^3 + 6l^2x^2\right]} \quad -(II)$$ ——— 2M

which is the req^d elastic curve.

For deflection at the free end B,

put $x = l$ in (II).

$$\boxed{\text{Deflection at B} = \frac{Wl^4}{8EI}}$$ ——— 1M

Q2(b) Given : $x_0 = 0,\ y_0 = 1,\ h = 0.2$

$$k_1 = h f(x_0, y_0) = h\sqrt{x_0 + y_0} = (0.2)\sqrt{0+1} = \boxed{0.2}$$ ——— 1M

$$k_2 = h f\left(x_0 + \frac{h}{2},\ y_0 + \frac{k_1}{2}\right) = h\sqrt{\left(x_0 + \frac{h}{2}\right) + \left(y_0 + \frac{k_1}{2}\right)}$$

$$\boxed{k_2 = 0.2191}$$

$$k_3 = h f\left(x_0 + \frac{h}{2},\ y_0 + \frac{k_2}{2}\right) = h\sqrt{\left(x_0 + \frac{h}{2}\right) + \left(y_0 + \frac{k_2}{2}\right)}$$

$$\boxed{k_3 = 0.2120}$$

$$k_4 = h f(x_0 + h,\ y_0 + k_3) = h\sqrt{(x_0 + h) + (y_0 + k_3)}$$ ——— 1M

$$\boxed{k_4 = 0.2377}$$

$$k = \frac{1}{6}(k_1 + 2k_2 + 2k_3 + k_4) = \boxed{0.2167}$$ ——— 1M

$$\therefore [y]_{x=0.2} = y_0 + k = 1 + 0.2167 = \boxed{1.2167}$$ ——— 1M

Q2(c)

$$A = LL^T \Rightarrow \begin{bmatrix} 4 & -2 & 0 \\ -2 & 4 & -1 \\ 0 & -1 & 4 \end{bmatrix} = \begin{bmatrix} l_{11} & 0 & 0 \\ l_{21} & l_{22} & 0 \\ l_{31} & l_{32} & l_{33} \end{bmatrix} \begin{bmatrix} l_{11} & l_{21} & l_{31} \\ 0 & l_{22} & l_{32} \\ 0 & 0 & l_{33} \end{bmatrix}$$ ——— 1M

Solving this, we get $L = \begin{bmatrix} 2 & 0 & 0 \\ -1 & \sqrt{3} & 0 \\ 0 & -1/\sqrt{3} & \sqrt{11}/\sqrt{3} \end{bmatrix}$ ——— 1M

$AX = B \Rightarrow LL^TX = B \rightarrow$ Put $L^TX = Z \rightarrow LZ = B.$

$$LZ = B \rightarrow \begin{bmatrix} 2 & 0 & 0 \\ -1 & \sqrt{3} & 0 \\ 0 & -1/\sqrt{3} & \sqrt{11/3} \end{bmatrix} \begin{bmatrix} z_1 \\ z_2 \\ z_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

$$\Rightarrow [z_1, z_2, z_3] = \left[0, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{33}}\right]$$

$$L^TX = Z \rightarrow \begin{bmatrix} 2 & -1 & 0 \\ 0 & \sqrt{3} & -1/\sqrt{3} \\ 0 & 0 & \sqrt{11/3} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 1/\sqrt{3} \\ 1/\sqrt{33} \end{bmatrix}$$

$$\Rightarrow [x_1, x_2, x_3] = \left[\frac{2}{11}, \frac{4}{11}, \frac{1}{11}\right]$$ ——— 2M

Q.3 a) calculate the first four central moments for the following data.

x_i	f_i	$d_i = x_i - 5$	$f_i d_i$	$f_i d_i^2$	$f_i d_i^3$	$f_i d_i^4$
1	1	-4	-4	16	-64	256
2	6	-3	-18	54	-162	486
3	13	-2	-26	52	-104	208
4	25	-1	-25	25	-25	25
5	30	0	0	0	0	0
6	22	1	22	22	22	22
7	9	2	18	36	72	144
8	5	3	15	45	135	405
9	2	4	8	32	128	512
Σ	113	:	-10	282	2	2058

2M

$\mu_1' = \frac{\Sigma f_i d_i}{\Sigma f_i} = -0.0885$, $\mu_2' = \frac{\Sigma f_i d_i^2}{\Sigma f_i} = 2.4956$

$\mu_3' = \frac{\Sigma f_i d_i^3}{\Sigma f_i} = 0.0177$, $\mu_4' = \frac{\Sigma f_i d_i^4}{\Sigma f_i} = 18.2124$

$\mu_1 = 0$, $\mu_2 = \mu_2' - (\mu_1')^2 = 2.4878$

$\mu_3 = \mu_3' - 3(\mu_2')(\mu_1') + 2(\mu_1')^3 = 0.6789$

$\mu_4 = \mu_4' - 4[\mu_3'](\mu_1') + 6(\mu_1')^2(\mu_2') - 3(\mu_1')^4 = 18.3358$ —2M

Due credit must be given to alternate method

Due credit should be given to alternate method

Q.3 b) $p = 0.001$, $n = 2000$, $\lambda = np = 2$. [4]

Poisson distribution $P(r) = \frac{e^{-\lambda}\lambda^r}{r!}$ — 1M

— 1M

$P(r \geq 2) = 1 - P(r \leq 2)$

$= 1 - [P(r=0) + P(r=1) + P(r=2)]$

$= 1 - \left[\frac{e^{-2}2^0}{0!} + \frac{e^{-2}2^1}{1!} + \frac{e^{-2}2^2}{2!}\right]$ — 2M

$= 0.3235$

Q.3 c) $\nabla\phi = [10xy + 2z^2]\bar{i} + [5x^2 - 10yz]\bar{j} +$ [4]

$[-5y^2 + 4xz]\bar{k}$ — 2M

$[\nabla\phi]_{(1,1,1)} = 12\bar{i} - 5\bar{j} - \bar{k}$

$\bar{a} = 2\bar{i} - 2\bar{j} + \bar{k}$

Directional Derivative $= [\nabla\phi]_{(1,1,1)} \cdot \hat{a} = 11$. — 2M

OR

Q.4 a) Prove the following (any one) [4]

i) $LHS = \nabla \cdot \left[r \nabla\left(\frac{1}{r^n}\right)\right]$ $\{f(r) = r^{-n}$, $\nabla f(r) = f'(r)\frac{\bar{r}}{r}\}$

$= \nabla \cdot \left[r\left(\frac{-n}{r^{n+1}}\right)\frac{\bar{r}}{r}\right]$ — 1M

$= (-n)\ \nabla \cdot \left[\frac{\bar{r}}{r^{n+1}}\right]$

$= (-n)\ \frac{r^{n+1}(\nabla \cdot \bar{r}) - \bar{r} \cdot (\nabla r^{n+1})}{(r^{n+1})^2}$ $[\nabla \cdot \bar{r} = 3]$

$= \frac{n(n-2)}{r^{n+1}} = RHS.$ — 3M

ii) $LHS = \nabla \cdot [\phi \nabla\psi - \psi\nabla\phi]$

$= \nabla \cdot [\phi\nabla\psi] - \nabla \cdot [\psi\nabla\phi]$ — 1M

$= [\phi\, \nabla \cdot \nabla\psi + \nabla\phi \cdot \nabla\psi] - [\psi\nabla \cdot \nabla\phi + \nabla\psi \cdot \nabla\phi]$ — 2M

$= \phi\nabla^2\psi - \psi\nabla^2\phi$ $[\because \nabla\phi \cdot \nabla\psi = \nabla\psi \cdot \nabla\phi]$

$= RHS.$ — 1M

Q.4 b) $\nabla \times \vec{F} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ ye^{xy}\cos z & xe^{xy}\cos z & -e^{xy}\sin z \end{vmatrix}$ —— 1M

$= 0$ —— 1M (check partial derivatin

$\phi = \int_{y,z\text{ constant}} ye^{xy}\cos z\, dx + \int_{z\text{ constant}} 0\, dy + \int 0\, dz$

$= y\cos z \frac{e^{xy}}{y} = e^{xy}\cos z + C$ —— 2M

$\int \phi = \int_{y,z\text{ const.}} (f_1\, dx + \int_{z\text{ const.}} [\text{Terms of } F_2 \text{ free from } x]\, dy + \int [\text{Terms of } F_3 \text{ free from } x \& y \text{ both}]\, dz.$

Q.5 a)

Q.5 c) $\bar{x} = 8.2,\ \bar{y} = 12.4,\ \sigma_x = 6.2,\ \sigma_y = 20.$

$r(x,y) = 0.9$

Reg. line of y on x is: $y - \bar{y} = r\frac{\sigma_y}{\sigma_x}(x - \bar{x})$.

$y = 2.9032x - 11.4062$ —— 1M

put $x = 10$

$y = 17.6258.$ —— 1M

Reg. line of x on y is $x - \bar{x} = r\frac{\sigma_x}{\sigma_y}(y - \bar{y})$

$x = 0.279y + 4.7404$ —— 1M

put $y = 10$

$x = 7.5304$ —— 1M

Q5 (a) Green's theorem $\int_C \bar{F}\cdot d\bar{r} = \iint_R \left(\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}\right) dx\,dy$ —— 1M

Here $\bar{F}\cdot d\bar{r} = (3y\,i + 2x\,j)\cdot(dx\,i + dy\,j)$, $M = 3y$, $N = 2x$

$= \iint (2-3)\,dx\,dy = -\int_0^{\pi}\int_0^{\sin x} dx\,dy$ —— 3M

$= -\int_0^{\pi} \sin x\,dx = +[\cos x]_0^{\pi} = -2$ —— 3M

(b) Gauss-Div theorem $\iint_S \bar{F}\cdot\bar{n}\,ds = \iiint_V (\nabla\cdot\bar{F})\,dv$ —— 1M

$\nabla\cdot\bar{F} = 3 = \frac{\partial}{\partial x}(2x+3z) + \frac{\partial}{\partial y}(-(xz+y)) + \frac{\partial}{\partial z}(y^2+2z)$

$= 2 - 1 + 2 = 3$ —— 2M

$= \iiint 3\,dV = 3\iiint dV$

$= 3(\text{vol of sphere}) = 3\left(\frac{4}{3}\pi(3)^3\right)$

$= 36\pi$ —— 3M

(c) Stoke's theorem $\iint_S (\nabla\times\bar{F})\cdot d\bar{s} = \int_C \bar{F}\cdot d\bar{r}$ —— 1M

$c: x^2+y^2=4 \quad z\geq 0$

$= \int_C (y^2\,dx + 2x\,dy + 7y\,dz)$

$= \int_C y^2\,dx$ —— 2M (sub $x = 2\cos\theta$, $y = 2\sin\theta$, $dx = -2\sin\theta\,d\theta$)

$= \int_C 4\sin^2\theta(-2\sin\theta\,d\theta)$

$= -8\int_C \sin^3\theta = 0$ —— 3M

Q6 (a) Work done $= \int \bar{F}\cdot d\bar{r}$ —— 1M

$\bar{r} = a\cos\theta\,i + a\cos\theta\,j + b\theta\,k$

$d\bar{r} = -a\sin\theta\,d\theta\,i - a\sin\theta\,d\theta\,j + b\,d\theta\,k$

$= \int_{\pi/4}^{\pi/2} [(-3a\sin^2\theta\cos\theta)(-a\sin\theta)d\theta + (a(2\sin\theta - 3\sin^2\theta)(-a\sin\theta\,d\theta) + b\cdot(b\sin 2\theta)(b\,d\theta)]$ —— 2M

$= \int_{\pi/4}^{\pi/2} (a^2\sin 2\theta + b^2\sin 2\theta)\,d\theta = (a^2+b^2)\int_{\pi/4}^{\pi/2} \sin 2\theta\,d\theta = \frac{a^2+b^2}{2}$ —— 4M

(b) Stoke's theorem $\int_C \bar{F}\cdot d\bar{r} = \iint_S (\nabla\times\bar{F})\cdot d\bar{s}$ —— 1M

Here $\bar{F} = \bar{u}\times(\bar{x}\times\bar{v})$ $\int_C [\bar{u}\times(\bar{x}\times\bar{r})]\cdot d\bar{r} = \iint_S \nabla\times[\bar{u}\times(\bar{x}\times\bar{v})]\cdot d\bar{s}$ —— 1M

Consider $\nabla\times[\bar{u}\times(\bar{x}\times\bar{v})]$

$= \nabla\times[\bar{x}(\bar{u}\cdot\bar{v}) - \bar{v}(\bar{u}\cdot\bar{x})]$

$= (\nabla\times\bar{x})(\bar{u}\cdot\bar{v}) - \nabla\times(\bar{v}(\bar{u}\cdot\bar{x}))$ —— 3M

$= 0 - (\bar{u}\times\bar{v})$

$= \iint -(\bar{u}\times\bar{v})\cdot d\bar{s}$

$= -(\bar{u}\times\bar{v})\cdot\iint_S d\bar{s}$ —— 2M

(c) Gauss-Divergence theorem $\iint_S \bar{F}\cdot\bar{n}\,ds = \iiint_V (\nabla\cdot\bar{F})\,dv$ —— 1M

Here $\bar{x} = \bar{F}$

$\nabla\cdot\bar{x} = 3$ —— 1M

$= \iiint_V (\nabla\cdot\bar{x})\,dv = 3\iiint dv = V$ —— 4M

Q 7(a) Given $\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^2 y}{\partial x^2}$ with boundary conditions

(i) $y(0,t) = 0$

ii) $y(l,t) = 0$

iii) $\left(\frac{\partial y}{\partial t}\right)_{t=0} = 3x(l-x) \quad 0 \le x < l$

iv) $y(x,0) = 0$

1M

Most general solution is

$y(x,t) = (C_1 \cos mx + C_2 \sin mx)(C_3 \cos cmt + C_4 \sin cmt)$ —— 1M

applying (i) we get

$y(0,t) = C_1(C_3 \cos cmt + C_4 \sin cmt) = 0 \Rightarrow C_1 = 0$

$y(x,t) = C_2 \sin mx (C_3 \cos cmt + C_4 \sin cmt)$.

using (iv) $y(x,0) = 0$.

$0 = C_2 \sin mx \cdot C_3 = 0 \Rightarrow C_3 = 0$

as $C_2 \neq 0$ $\sin mx \neq 0$.

$y(x,t) = C_2 \sin mx \, C_4 \sin cmt$

$= C_5 \sin mx \sin cmt = 0$.

using (ii) $y(l,t) = 0$.

$0 = C_5 \sin ml \sin cmt = 0$.

$\sin ml = 0 \quad ml = n\pi \quad m = \frac{n\pi}{l} \quad n = 1, 2 \cdots$

$y(x,t) = \sum b_5 \sin \frac{n\pi x}{l} \sin \frac{cn\pi t}{l}$. $\quad n = 1, 2 \cdots$ ——

$\left(\frac{\partial y}{\partial t}\right)_{t=0} = C_5 \sin \frac{n\pi x}{l}$

Combining above solution.

$y(x,t) = \sum b_n \sin \frac{n\pi x}{l} \sin\left(\frac{cn\pi t}{l}\right)$ —— 3M

$\left(\frac{\partial y}{\partial t}\right)_{t=0} = \sum_{n=0}^{\infty} \sin\left(\frac{n\pi x}{l}\right)\left(\frac{cn\pi}{l}\right) \cos\left(\frac{cn\pi t}{l}\right)\Big]_{t=0}$

$3x(l-x) = \sum_{0}^{\infty} \left(b_n \frac{cn\pi}{l}\right) \sin \frac{n\pi x}{l} \quad 0 < x < l$

which is fourier half range sine series.

$$b_n \frac{cn\pi}{\ell} = \frac{2}{\ell}\int_0^{\ell} 3x(1-x)\sin\left(\frac{n\pi x}{\ell}\right)dx$$

$$= \frac{2}{\ell}\left[\frac{-6(-1)^n}{\left(\frac{n\pi}{\ell}\right)^3} + \frac{6}{\left(\frac{n\pi}{\ell}\right)^3}\right]$$

$$b_n\left(\frac{cn\pi}{\ell}\right) = \frac{12\ell^2}{n^3\pi^3}(1-(-1)^n) = \frac{12\ell^3}{\ell n^4\pi^4}(1-(-1)^n)$$

$$b_n = \frac{12\ell^3}{cn^4\pi^4}(1-(-1)^n)$$

$$y(x,t) = \sum_{n=1}^{\infty} \frac{12\ell^3}{cn^4\pi^4}(1-(-1)^n)\sin\frac{n\pi x}{\ell}\sin\left(\frac{cn\pi t}{\ell}\right)$$

$$= \frac{24\ell^3}{c\pi^4}\sum\frac{1}{(2n+1)^4}\sin\frac{(2n+1)\pi x}{\ell}\sin\left(\frac{c(2n+1)\pi t}{\ell}\right)$$

2M

Q.7 b) we have $\frac{\partial u}{\partial t} = c^2\frac{\partial^2 u}{\partial x^2}$ with boundary conditions i) u is finite for all t

ii) $u(0,t) = 0 \quad \forall t$

iii) $u(\ell,t) = 0 \quad \forall t$

iv) $u(x,0) = u_0$ for $0 \le x \le \ell$

The most general solution is

1M

$$u(x,t) = (c_4\cos mx + c_5\sin mx)e^{-m^2c^2t}$$

$c_4 = 0$, so $u(x,t) = c_5\sin mx\, e^{-m^2c^2t}$

$b_4(ii)$, $0 = c_5\sin m\ell\, e^{-m^2c^2t}$.

$\sin m\ell = 0$, $m\ell = n\pi \quad m = \frac{n\pi}{\ell}$, $n = 1, 2\ldots$

$$u(x,t) = c_5\sin\frac{n\pi x}{\ell}\, e^{\frac{-n^2\pi^2c^2t}{\ell^2}} \quad n = 1, 2\ldots$$

Combining

$$u(x,t) = \sum_{1}^{\infty} b_n \sin\frac{n\pi x}{l} e^{-\frac{n^2\pi^2 c^2 t}{l^2}}$$ —— 3M

applying (iv)

$$u_0 = \sum_{1}^{\infty} b_n \sin\frac{n\pi x}{l}$$

$$b_n = \frac{2}{l}\int_0^l u_0 \sin\frac{n\pi x}{l}\,dx = \frac{2u_0}{l}\left(-\frac{l}{n\pi}\cos\frac{n\pi x}{l}\right)_0^l$$

$$b_n = \frac{2u_0}{\pi}\left(\frac{1-(-1)^n}{n}\right)$$ —— 2M

$$u(x,t) = \frac{2u_0}{\pi}\sum_{1}^{\infty}\left(\frac{1-(-1)^n}{n}\right)\sin\frac{n\pi x}{l}\, e^{-\frac{n^2\pi^2 c^2 t}{l^2}}$$ —— (3m)

Q7 (c). we have PDE

$$\frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} = 0$$ with boundary conditions

i) $V = 0$ when $y \to +\infty$ for all x

ii) $V(0, y) = 0 \quad \forall y$

iii) $V(1, y) = 0 \quad \forall y$

iv) $V(x, 0) = x(1-x)$ for $0 < x < 1$.

The most general solution is

$$V(x,y) = (c_1\cos mx + c_2\sin mx)(c_3 e^{my} + c_4 e^{-my})$$ —— 1M

(i) $\Rightarrow \quad c_3 = 0$

(ii) $\Rightarrow \quad c_1 = 0.$

$$V(x,y) = c_5 \sin mx\, e^{-my}$$

condition (iii) $\Rightarrow \quad 0 = c_5 \sin m\, e^{-my}$

as $c_5 \neq 0 \quad e^{-my} = 0 \quad \sin m = 0, \quad m = n\pi \quad n = 1, 2, 3$

$$V(x,y) = c_5 \sin n\pi x\, e^{-n\pi y} \qquad n = 1, 2, \ldots$$ —— 3M

applying conditions (iv)

$x(1-x) = \sum_{1}^{\infty} b_n \sin n\pi x \qquad 0<x<1.$ —(3M)

which is represented by half-range Fourier sine series for $f(x) = x(1-x)$ in $(0,1)$.

$$b_n = 2\int_0^1 x(1-x)\sin n\pi x\, dx.$$

$$= 2\left\{(x-x^2)\left(-\frac{\cos n\pi x}{n\pi}\right) - (1-2x)\left(-\frac{\sin n\pi x}{n^2\pi^2}\right) + (-2)\left(\frac{\cos n\pi x}{n^3\pi^3}\right)\right\}_0^1$$

$$b_n = \frac{4}{\pi^3}\left(\frac{1-(-1)^n}{n^3}\right)$$

So complete solution is

$$v(x,y) = \frac{4}{\pi^3}\sum_{1}^{\infty}\left(\frac{1-(-1)^n}{n^3}\right)\sin n\pi x\, e^{-n\pi y}$$ —2M

Q 8 (a) we have $\frac{\partial^2 y}{\partial t^2} = c^2\frac{\partial^2 y}{\partial x^2}$ subject to the conditions i) $y(0,t)=0$

ii) $y(2l,t)=0$

iii) $\left(\frac{\partial y}{\partial t}\right)_{t=0}=0$

iv) $y(x,0) = \begin{cases} \frac{bx}{l} & ; \ 0<x<l \\ \frac{b}{l}(2l-x) & , \ l<x<2l \end{cases}$

most general solution is

$y(x,t) = (c_1\cos mx + c_2\sin mx)(c_3\cos cmt + c_4\sin(cmt)$ —1M

using (i) $c_1=0$

using (iii) $c_4=0$.

$y(x,t) = c_5\sin mx\cos cmt$

using (ii) $y(2l,t) = c_5\sin 2ml\cos cmt=0$.

$2ml = n\pi \qquad n=1,2\ldots$

$$m = \frac{n\pi}{2l} \qquad n = 1, 2, 3 \cdots$$

$$y(x,t) = c_5 \sin\left(\frac{n\pi x}{2l}\right) \cos\left(\frac{cn\pi t}{2l}\right) \quad n = 1, 2 \cdots$$

Combining.

$$y(x,t) = \sum_{1}^{\infty} b_n \sin\left(\frac{n\pi x}{2l}\right) \cos\left(\frac{cn\pi t}{2l}\right)$$ ——— 3M

$$y(x,0) = \sum_{1}^{\infty} b_n \sin\frac{n\pi x}{2l}$$

which is half rang fourier series for

$$\text{so } b_n = \frac{2}{2l}\int_0^{2l} y(x,0) \sin\left(\frac{n\pi x}{2l}\right) dx$$

$$= \frac{1}{l}\int_0^{l} \left(\frac{bx}{l}\right) \sin\left(\frac{n\pi x}{2l}\right) dx + \int_l^{2l} \frac{b}{l}(2l-x) \sin\left(\frac{n\pi x}{2l}\right) dx$$

$$= \frac{8bl^2}{l^2n^2\pi^2} \sin\left(\frac{n\pi}{2}\right)$$ ——— 2M

$$y(x,t) = \sum_{1}^{\infty} \frac{8b \sin\frac{n\pi}{2}}{n^2\pi^2} \sin\left(\frac{n\pi x}{2l}\right) \cos\left(\frac{cn\pi t}{2l}\right)$$

$$= \frac{8b}{\pi^2} \sum_{1}^{\infty} \frac{\sin n\frac{\pi}{2}}{n^2} \sin\left(\frac{n\pi x}{2l}\right) \cos\left(\frac{cn\pi t}{2l}\right)$$

~~(3M)~~ 1M

Q8 (b) we have $\frac{\partial V}{\partial t} = k\frac{\partial^2 V}{\partial x^2}$ subject to conditions

i) V is finite as $t \to \infty$

ii) $\left(\frac{\partial V}{\partial x}\right)_{x=0} = 0 \quad \forall t$.

iii) $V(l,t) = 0 \quad \forall t$

iv) $V(x,0) = V_0$ for $0 < x < t$.

The most general solution is

$$v(x,t) = (C_4 \cos mx + C_5 \sin mx)\, e^{-m^2 k t}$$ ——— 1M

$$\frac{\partial v}{\partial x} = (-mC_4 \sin mx + mC_5 \cos mx)\, e^{-m^2 k t}$$

(ii) gives $C_5 = 0$

$$v(x,t) = C_4 \cdot \cos mx \cdot e^{-m^2 k t}$$

condition (iii) gives $0 = C_4 \cos ml\, e^{-m^2 k t}$

$$\cos ml = 0 \Rightarrow ml = \frac{n\pi}{2} \quad n \text{ is odd}$$

$$m = \frac{(2n+1)}{l}\frac{\pi}{2} \qquad n = 0, 1, 2 \cdots$$

$$v(x,t) = C_4 \cos\left[\frac{(2n+1)\frac{\pi}{2}x}{l}\right] x \; e^{\frac{-\left[(2n+1)^2\frac{\pi^2}{4}\right]kt}{l^2}}$$

$n = 0, 1, 2 \cdots$

Combining all solutions

$$v(x,t) = \sum_0^\infty a_{2n+1} \cos\left[\frac{(2n+1)\frac{\pi}{2}x}{l}\right] e^{-\frac{(2n+1)^2\pi^2/4}{l^2}kt}$$ ——— 3M

condition (i) gives

$$v_0 = \sum a_{2n+1} \cos\frac{(2n+1)\pi/2\, x}{l}$$

which is half range Fourier cosine series for $f(x) = v_0$. with $a_0 = 0$.

$$a_{2n+1} = \frac{2}{l}\int_0^l v_0 \cos\left[\frac{(2n+1)\pi/2\, x}{l}\right] dx$$

$$= \frac{2v_0}{l}\left[\frac{2l}{(2n+1)\pi}\sin\frac{(2n+1)\pi x}{2l}\right]_0^l$$

$$= \frac{4v_0}{\pi}\frac{1}{2n+1}\sin(2n+1)\frac{\pi}{2} = \frac{4v_0}{\pi}\frac{(-1)^n}{2n+1}$$

$$v(x,t) = \frac{4v_0}{\pi}\sum_{n=0}^{\infty}\frac{(-1)^n}{2n+1}\cos\frac{(2n+1)\pi x}{2l}\, e^{\frac{-(2n+1)^2\pi^2 k}{4l^2}}$$ ——— 2M

8 (c) Temperature $u(x,y)$ satisfies $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ subject to conditions

i) $u(0,y) = 0$
ii) $u(1,y) = 0$
iii) $u(x,\infty) = 0$ for $0 < x < 1$
iv) $u(x,0) = 100$ for $0 < x < 1$

1M

The most general solution is

$u(x,y) = (c_1 \cos mx + c_2 \sin mx)(c_3 e^{my} + c_4 e^{-my})$ —— 1M

using (iii). $c_3 = 0$.

$u(x,y) = (c_1 \cos mx + c_2 \sin mx)\, c_4 e^{-my}$

using (i) we get $c_1 = 0$.

$u(x,y) = c_2 \sin mx\, e^{-my}$

using (ii) we get-

$u(1,y) = c_2 \sin m e^{-my} = 0$

$\sin m = 0 \quad m = n\pi \quad n = 1, 2 \ldots$

$u(x,y) = c_2 \sin n\pi x\, e^{-n\pi y} \quad n = 1, 2 \ldots$

$u(x,y) = \sum_1^\infty b_n \sin(n\pi x)\, e^{-n\pi y}$ —— 2M

$u(x,0) = \sum_1^\infty b_n \sin n\pi x = 100$

$b_n = \frac{2}{1}\int_0^1 100 \sin(n\pi x)\, dx$

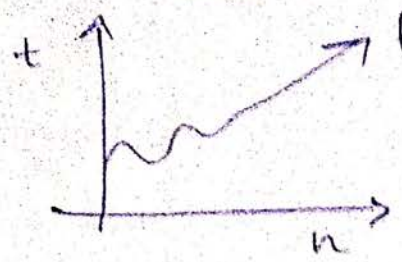
$= 200 \left(-\frac{\cos n\pi x}{n\pi}\right)_0^1$

$= \frac{200}{n\pi}\left[-(-1)^n + 1\right] = \frac{200\left[1-(-1)^n\right]}{n\pi}$

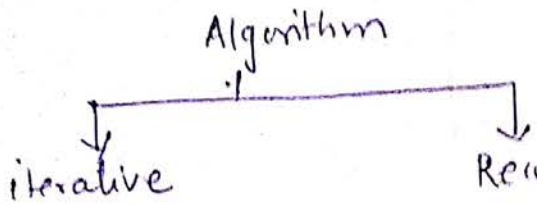
$u(x,y) = \sum_{n=1}^\infty \frac{400}{\pi} \frac{\sin(2n-1)\pi x}{(2n-1)} e^{-(2n-1)\pi y}$

2M

✪ ✪ ✪



How to find f(n) i.e how to find approximate time taken by algorithm to execute. so we need to find time complexity.




```
A()
{
 for i=1 to n
     max(a,b)
}
```

```
A()
{
   if()
   A(n/2)
}
```

← Recursive function

Any program can be converted to vice versa i.e iterative to recursive & recursive to iterative.

If algorithm does not contain iteration or recursion then there is no dependency on input so the time taken by algorithm to execute is constant O(1).

Iterative examples.

1)
```
A()
{ int i ;
  for( i=1 to n)
     pf ("Ravi") ;
}
```

← n time line will be printed so complexity of this algorithm is O(n).

```
A()
{ int i ,j;
  for(i= 1 to n )
     for(j=1 to n)
        pf (" Ravi");
}
```

=> $O(n^2)$

1991 Gate

2)

```
A()
{ i=1, s=1 ;
  while (s<=n)
    { i++ ;
      s=s+i ;
      pf("Ravi");
    }
}
```

i is incrementing linearly by step 1.

Increment in s depend on i

S: 1 3 6 10 15 21 .... $\frac{k(k+1)}{2}$ (n)

i: 1 2 3 4 5 6 ....

we dont know value of n, it is not given

Here, while loop will stop after k iterations

so we need to find what will be the value of s after k iterations.

Here for every iteration k, S value is sum of first k natural numbers.

$$\frac{K(K+1)}{2} > n$$

$$\frac{k^2+k}{2} > n$$

$$k = O(\sqrt{n})$$

3)

```
A()
{ i=1
  for(i=1 ; i*i<=n ; i++)
      pf("Ravi")
}
```

$i <= \sqrt{n}$

Here, $i^2 <= n$ we can write it as $i <= \sqrt{n}$ so time complexity is $O(\sqrt{n})$.

Here, best case & worse case is $\sqrt{n}$

So we could even write it as $\Theta(\sqrt{n})$

4)| ✓

```
A()
{ int i, j, k, n;
  for (i=1 ; i<=n; i++)
  {
    for (j=1 ; j<=i ; j++)
    {
      for (k=1; k<=100; k++)
      {
        pf ("ravi");
      }
    }
  }
}
```

i=1 | j= 1 time | k = 100 times

i= 2 | j= 2 times | k= 2*100 times

i= 3 | j= 3 times | k= 3*100 times

i= 4 | j= 4 times | k= 4*100 times

i=5 | j=5 times | k = 5*100 times.

..... i= n | j= n times | k = n*100 times.

So together we need to find how many times printf is executed ?.

$= 100 + 2*100 + 3*100 + 4*100 + 5*100 + \cdots + n*100$

$= 100 (1+2+3+4+5+\cdots+100)$

$= 100 \left(\frac{n(n+1)}{2}\right)$

$= O(n^2)$

5) ✓

```
A()
{ int i, j, k, n;
  for (i=1 ; i<=n ; i++)
  { for(j=1; j<=i^2; j++)
    { for(k=1, k<=n/2, k++)
      { pf("Ravi"); }
    }
  }
```

i=1 | j= 1 time | k= n/2 * 1

i=2 | j =4 time | k= n/2 * 4

i=3 | j= 9 time | k= n/2 * 9

i=4 | j= 16 time | k= n/2 * 16

..... i= n | j= n^2 | k= n/2 * n^2

So together how many time printf is executed.

$= \frac{n}{2}*1 + \frac{n}{2}*4 + n/2 * 9 + \cdots + \frac{n}{2}*n^2$

$= n/2 (1 + 4 + 9 + 16 + \cdots + n^2)$

6

```
A()
{ for(i=1; i<n; i=i*2)
    pf("ravi");
}
```

i = 1, 2, 4, 8 ..... n

$2^0, 2^1, 2^2, 2^3 \cdots 2^k$

so $2^k = n$

$k = \log n$

so $f(n) = O(\log_2 n)$

7

```
A()
{ for(i=1; i<n; i=i*3)
    pf("ravi");
}
```

i = 1 * 3 9 27 .... n

$3^0, 3^1, 3^2, 3^3 \cdots 3^k$

after k iteration

$3^k = n$

$k = \log_3 n$

If $i = i*4$ i.e

for i=1 to n and $i = i*4$ then $f(n) = \log_4(n)$

8

```
A()
{ int i, j, k;
  for(i=n/2, i<=n; i++): → will execute only half time so (n/2)
    for(j=1, j<=n/2; j++) → (n/2)
      for(k=1; k<=n; k=k*2) → log2 n
        pf("ravi");
}
```

Here, every loop is independent so we do not need to unro
the loop.

so $f(n) = n/2 * n/2 * \log_2 n$

$f(n) = O(n^2 \log_2 n)$

9]

```
A()
{ int i, j, k;
  for(i=n/2; i<=n; i++)          ⟶ n/2
    for(j=1; j<=n; j=2*j)        ⟶ log2 n
      for(k=1; k<=n; k=k*2)      ⟶ log2 n
        pf("Ravi")
}
```

$f(n) = n/2 * \log_2 n * \log_2 n$

$= n/2 * (\log_2 n)^2$

$\boxed{f(n) = O(n(\log_2 n)^2)}$

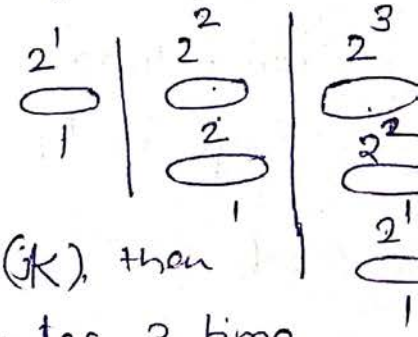
10]

Assume $n \geq 2$

```
A()
{
  while(n>1)
  { n = n/2
  }
}
```

Lets say n is 2's power

i.e

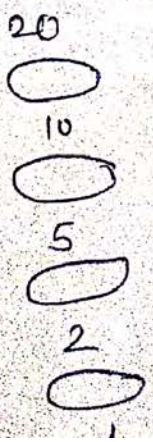


So Here, we observed when n is 2's power (k), then loop executes k time. i.e 2^3 then loop executes 3 time. If 2^2 loop executes 2 times. so for k^{th} power, it is k h

so, $n = 2^k$

$\boxed{\log_2 n = k}$

If n is not 2's power say $n = 20$



So Here $\log_2 20 = 4.2$

so $\lfloor \log_2 20 \rfloor$ absolute value is 4.

if n is getting divided by 3 it is $\log_3^n$. for dividing by 3

it is $\log_5^n$.

11

```
A()
{
  for(i=1, i<=n; i++)
    for(j=1; j<=n; j=j+i)
      pf("ravi");
}
```

i=1	i=2	i=3	.. K	...
j=1 to n	j=1 to n	j=1 to n	j=1 to n	
pf() n time	n/2 times	n/3 times	n/k times	

.... | n | j=1 to n | n/n time |

Here inner loop is dependent on i, i.e incrementing step in inner loop is by i step, so we need to unroll loops.

So total time printf will be executed is,

$$f(n) = n + \frac{n}{2} + \frac{n}{3} + \cdots \frac{n}{k} + \frac{n}{n}$$

$$= n\left(1 + \frac{1}{2} + \frac{1}{3} + \cdots \frac{1}{k} + \frac{1}{n}\right)$$

$$= n(\log n)$$

$$\boxed{f(n) = O(n \log n)}$$

12

```
A()
{ int n = 2^k;
  for(i=1; i<=n; i++) --> n times
    { j=2;
      while(j<=n)
        { j = j^2;
          pf("Ravi");
        }
    }
```

Here, value of n depends of value of k. However k is not given. so we need to unroll loops.

k = 1	k = 2	k = 3
n = 4	n = 16	$n = 2^{2^3} = 2^8$
j = 2, 4	j = 2, 4, 16	$j = 2, 2^2, 2^4, 2^8$
n * 2 times	n * 3 times	n * 4 times.

So for every kth iteration loop is executes $n * (k+1)$ time.

Now we need this, in terms of n so. we have given

$$n = 2^{2^k}$$

$$\log_2 n = 2^k$$

$$\log(\log_2 n) = k$$

So $n(k+1) = n(\log\log n + 1)$

$$\therefore \therefore \boxed{f(n) = O(n(\log(\log n)+1))}$$

Unit II

Sequential memory organization.

Array Elements are stored in consecutive memory locations.

- Size is defined at the time of programming
- Insertion / Deletion is time consuming
- Requires contiguous memory.

ADT for array

Array is set of pairs, index & value, for each index there is value associated with it.

operations

1. create () → array
2. Retrieve(array, index) → value
3. store (array, index, value) → array
4. Update (array, index, value) → array
5. Delete (array, index) → array,
6. search (array, values) → index.

Representation of Array.

```
type variable_name [size]
int numbers [10];
float marks [5];
char name [20];
printf ("%d %u", a[i], &a[i]);
```

Deletion of element from array.

In order to delete the given position element, all the elements ahead of position should be moved left by one location.

0	1	2	3
2	4	5	6
	↑		

```
void delete (int a[10], int pos)
{   pos= pos-1 ; j= pos+1 ;
    while (j<n)          // total size of array
    {  a[j-1]= a[j] ;
       j++ ;
    }
   n= n-1 ;
}
```

Insertion of element to array

insert an arbitrary element at specified location in an array.

0	1	2	3	4
2	4	5	6	
	↑			

n=4

```
void insert (int a[], int pos, int ele)
{   pos= pos-1 ;
   for(i= n-1 ; i>= pos ; i++)
    {  a[i+1] = a[i];
    }
   a[pos] = ele ;
   n++ ;
}
```

Merging of Sorted arrays.

a = | 1 | 5 | 9 | 11 | 13 | $n_1 = 5$

b = | 2 | 4 | 5 | 6 | $n_2 = 4$

c = | 1 | 2 | 4 | 5 | 5 | 6 | 9 | 11 | 13 | $n = 9$

merge

n_1 = size of a
n_2 = size of b

```
i=0 , j=0, k=0
while (i<n1 && j<n2)
  { if a[i] <= b[j])
      {
        c[k++] = a[i];
        i++;
      }
    else
      { c[k++] = b[j];
        j++;
      }
  }
while (i<n1)
  { c[k++] = a[i];
    i++;
  }
while (j<n2)
  { c[k++] = b[j++];
```

Reverse Array

Write pseudo code to reverse the n numbers in one dimensional array.

```
main()
{  int a[1000]
   read n // no. of elements.
   for i=0 to n-1
        read a[i]

   i=0;
   j=n-1;
   while(i<j)
   {
        interchange a[i] & a[j] //   temp=a[i];
                                    a[i]=a[j];
                                    a[j]=a[i];
        i=i+1;
        j=j+1
   }
   for i=0 to n-1
        print a[i];
}
```

Example

0	1	2	3
4	5	6	8

n = even

i = 0 < j = 3
i = 1 < j = 2
i = 2 > j = ~~1~~ — no need to interchange

n = odd

4	5	6	8	9
0	1	2	3	4

n = 5

i = 0 < j = 4
i = 1 < j = 3
i = 2 >= j = 2 → No need to interchange

Applications of Arrays.

① Add two matrices $a_{m \times n}$ and $b_{m \times n}$ producing $c_{m \times n}$ then (i,j)th element of the resultant matrix.

```
c[i][j] = a[i][j] + b[i][j]
```

a & b must be of the same size.

```
main()
{ read(a,m,n) . // read array a
  read(b,m,n) // read array b
  add(a,b,c,m,n);
}

void add(int a[10][10], int b[10][10], int c[10][10], int m,
         int n)
{
  int i,j;
  for(i=0; i<m; i++)
    { for(j=0; j<n; j++)
      {
        c[i][j]= a[i][j]+ b[i][j];
      }
    }
```

② Count Non-zero elements of matrix:

```
count=0;
for(i=0; i<m; i++)
  { for(j=0; j<n; j++)
    { if(a[i][j]!=0)
        count++;
    }
```

3) write a program to find sum of all elements of di

	0	1	2	3
0	[2]	3	4	1
1	5	[6]	7	0
2	1	2	[1]	4
3	3.	1	2	[3]

m = 4
n = 4

Diagonal = [row index == column index]

```
sum=0;
for( i=0; i<m; i++)
  { for( j=0; j<n; j++)
    { if ( i==j )
        { sum= sum+ a[i][j] ;
        }
    }
}
print sum;
```

or

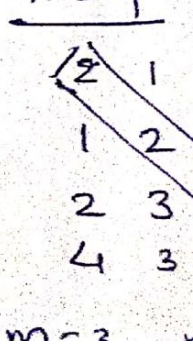
```
for(i= 0; i<m;
{sum=sum+a
}
```

efficient →

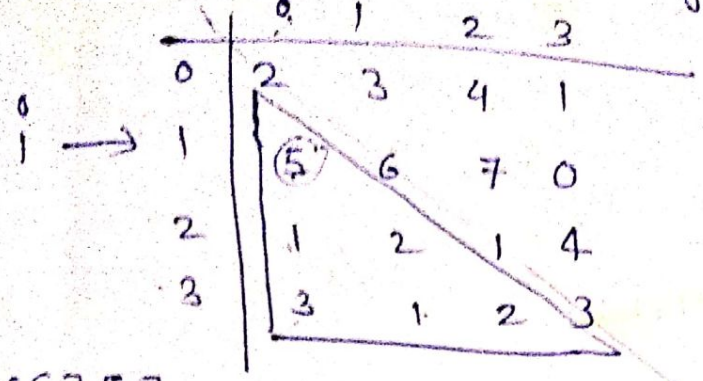
```
sum=0;
if(m<=n)
{ for(i=0 ; i<m; i++)
  { sum= sum+ a[i][i] ;
  }
}
```

a[0][0]+ a[1][1] + a[2][2] + a[3]

m = 4



Summation of Lower triangular elements

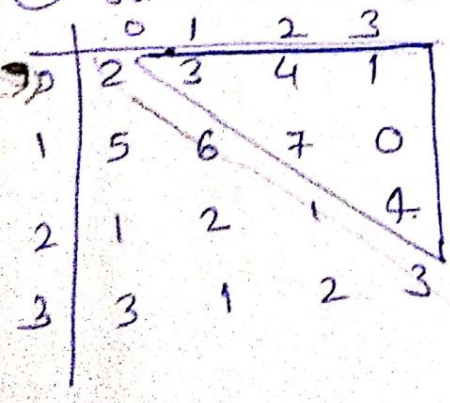


a[1][0]
a[2][0] + a[2][1]
a[3][0] + a[3][1] + a[3][2]

i { 1 — 0 ; 2 — 0 to 1 ; 3 — 0 to 2 } j

```
Sum = 0
for ( i = 0 ; i<m ; i++ )
   {  for ( j = 0 ; j < i ; j++ )
        {  Sum = Sum + a[i][j] ;
        }
   }
print sum.
```

(5) Summation of Upper triangular elements.



a[0][1] + a[0][2] + a[0][3]
a[1][2] + a[1][3]
+ a[2][3]

~~i = 0 to 2~~ ; i { 0 — 1 to 3 ; 1 — 2 to 3 ; 2 — 3 }

m=4

```
Sum = 0 ;   i<m-1
for ( i = 0 ; i<m-1 ; i++ )
   {  for ( j = i+1 ; j<n ; j++ )
        Sum = Sum + a[i][j] ;
```

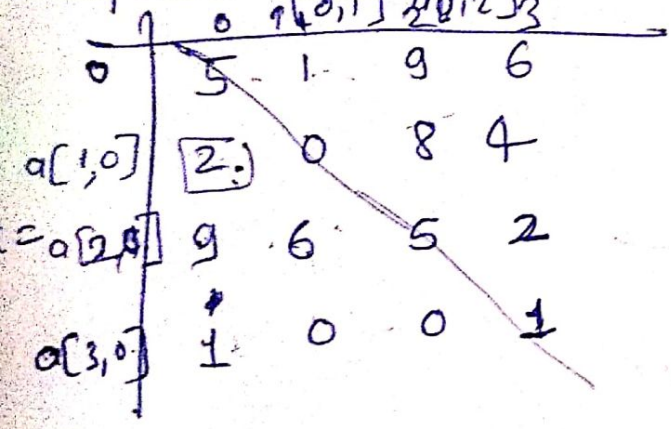
Initializing Two-Dimensional Arrays.

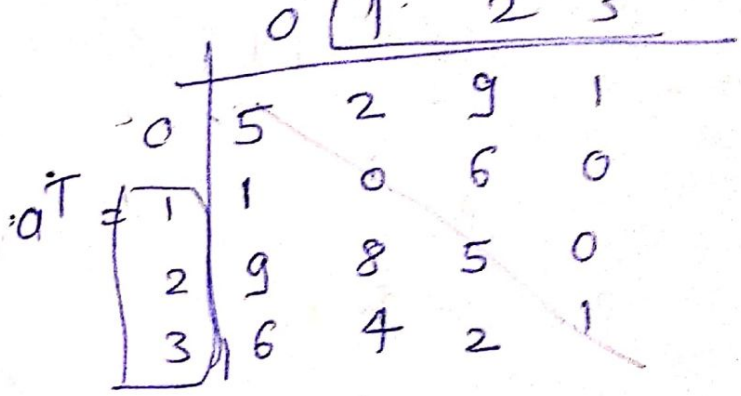
int a[2][3] = { 0,1,1,1,0,0 };

above statement can be equivalently written as,

int a[2][3] = { {1,1,1}, {2,2,2} };

Transpose of square matrix.





Transpose of square matrix can be found by interchanging all elements aij of the lower triangular matrix, with the corresponding elements aji.

```
for(i=1 ; i<m ; i++)
  { for(j=0 ; j<i ; j++)
    {
      interchange a[i][j] with a[j][i]
    }
  }
```

DSA

UNIT III

1) Comparison of sequential and linked organisation.
(Eg. compare array & linked list)

→ Array data structure is simple to use and supported by almost all programming languages.

- Simple to use
- Simple to define
- Constant access time
- Mapping by compiler

} Properties of array

Limitations

- Size of array is defined at the time of programming
- Insertion & deletion is time consuming.
- Requires contiguous memory.

Linked list is an example of dynamic data structure. They can grow and shrink during execution of the program.

- Linked list can represent linear data structure stack, queue, polynomial etc.
- Efficient memory utilisation - allocated & deallocated according to need
- Insertion and deletions are easier & efficient.

2) Dynamic Memory Management

Memory space required by variables is calculate & allocated during execution.

Functions

1. malloc() function allocates a block of memory that contains the number of bytes specified in its parameter

calloc() allocates the requested memory & returns a pointer. Difference between malloc & calloc is that malloc does not set the memory to zero where as calloc sets allocated memory to zero.

ptr = (cast_type) (element_count, size of each element);

Example:

```
n=5; int *a;
    a = (int *) calloc (n, sizeof(int));

    free (a);
```

malloc() example

```
char *str;
str = (char *) malloc (15); // Initialise or allocate memory.
strcpy (str, "scscoecollege!!");
printf ("%s", str);
//reallocating memory
str = (char *) realloc (25);
strcat (str, ".com");
free (str);
```

realloc() changes the size of the previously allocated block of memory. This is done by either deleting or extending the memory at the end of the block. If memory cannot be extended realloc() allocates a completely new block of memory.

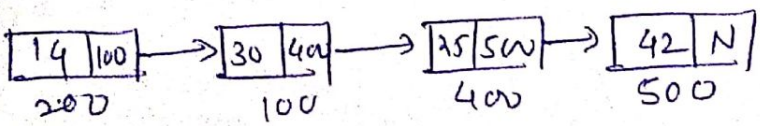
```
ptr = realloc (ptr, newsize);
```

free() - When the memory is no longer needed, it should be returned back by using the function free().

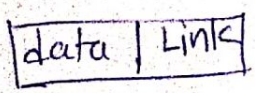
```
free(ptr);
```

Linked List

Linked list is a very common data structure often used to store similar data in memory. While the elements of an array occupy contiguous memory locations, those of a linked list are not constrained to be stored in adjacent locations. The individual elements are stored "somewhere" in memory, rather like a family dispersed, but still bound together. The order of the elements is maintained by explicit links between them. For instance, the marks obtained by different students can be stored in a linked list as shown below.



← Linked List.



Node

A link is a pointer or an address that indicates explicitely the location of the node containing the

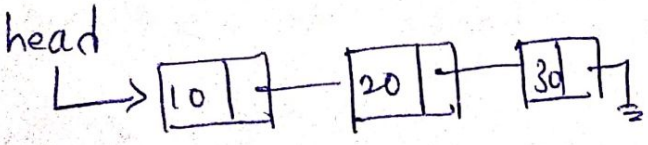
Implementation

Structures in c can be used to define a node. Address of the successor node can be stored in a pointer type variable.

```
typedef struct node
{   int data;
    struct node *next;
} node;

node *p;
p= (node*) malloc (sizeof(node));
p→data = 5;
p→next = NULL;
```

Head Pointer and Header Node

As an array is referenced by it's starting address, a linked list is known by the address of it's head node.



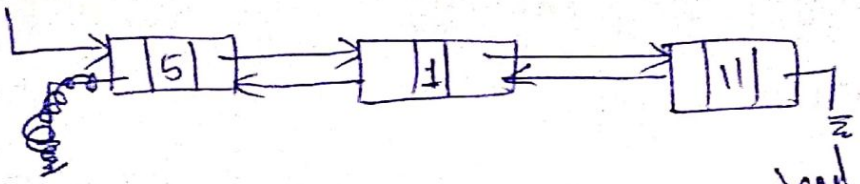
Types of Linked List

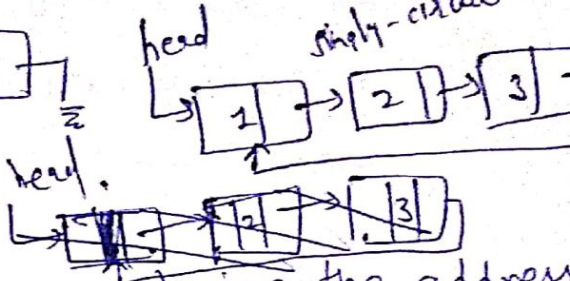
1) Singly linked list

Two successive nodes of the linked list are linked with each other in sequential linear manner. movement in forward direction is possible only.

Doubly linked list

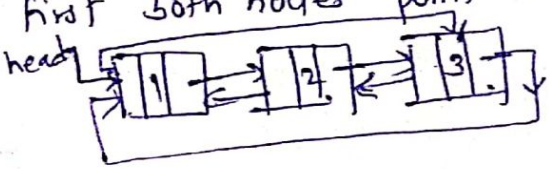
Holds two pointer fields. In doubly linked list address of next as well as previous / preceding element are stored in current node.





3) A circular linked list

In a circular linked list we are storing the address of the first node in the next field of the last node, if it is singly list. In doubly list Last & first both nodes point to each oth



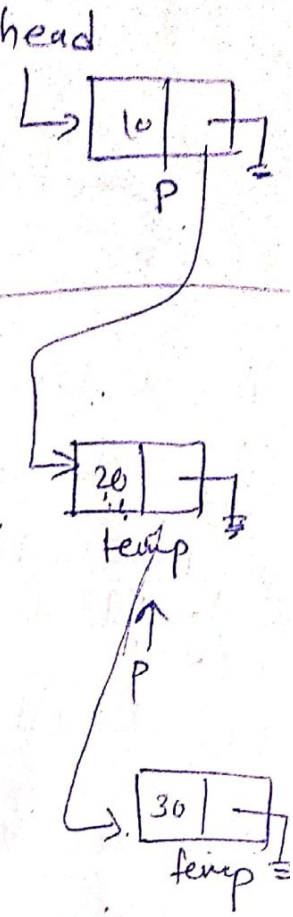
Basic Linked List Operations

1. create linked list
2. Traverse linked list
3. Count no. of nodes
4. Search an item
5. Delete an item
6. Concatenate two lists
7. Merge two sorted linked list
8. Insert an item.

Create link list

```
typedef struct node
  { int data;
    struct node *next;
  } node;

node* create (int);
void main()
{
  head = NULL;
  printf (" Enter size of list");
  scanf ("%d", &n);
  head = create(n);
}
```

```
node * create (int n)
{
    node *head, *p, *temp;
    int i;
    printf("Enter Node values for %d node", n);
    p = (node*)malloc(sizeof(node));
    scanf("%d", &(p->data));
    p->next = NULL;
    head = p;

    for(i=1; i<n; i++)
    {
        temp = (node*)malloc(sizeof(node));
        temp->next = NULL;
        scanf("%d", &(temp->data));
        p->next = temp;
        p = p->next;
    }

    return head;
}
```




```
// Print List
void print(node *p)
{
    while(P != NULL)
    {
        printf("%d -> ", p->data);
        p = p->next;
    }
    printf("NULL");
}
```

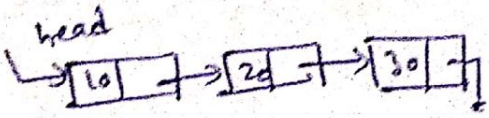
10 → 20 → NULL

// count no. of elements of list.

```
int count (node *p)
{
    int i=0;
    while (p!=NULL);
    {
        i++;
        p= p->next;
    }
    return (i);
}
```

```
node * del (node *p, int num)
{
    node * temp, *old, *start;
    old= NULL;
    temp = p;    start= p;
    while( temp!= NULL )
    {
        if (temp->data == num)
        {
            if ( temp == p)
            { p = temp->next;    start = p; }
            else { old->next = temp->next; }
            deleteNode(temp);
        }
        else { old = temp;
               temp = temp->next;
```

```
node * del (node *head, int num)
{   node *temp, *old
    temp = head;
    old = NULL;
    while ( temp != NULL )
    {
        if ( temp -> data == num )
        {
            if( temp == head )  //starting node
            {
                head = temp->next ;
                free (temp);
            }
            else
            {
                old -> next = temp->next ;
                free (temp);
            }
        }
        else { old = temp; temp = temp->next; }
    }
    return head;
}
```



Conversion of expression prefix into infix

→ Expression is scanned from right to left

→ whenever an operator is found, it is put in between two operands.

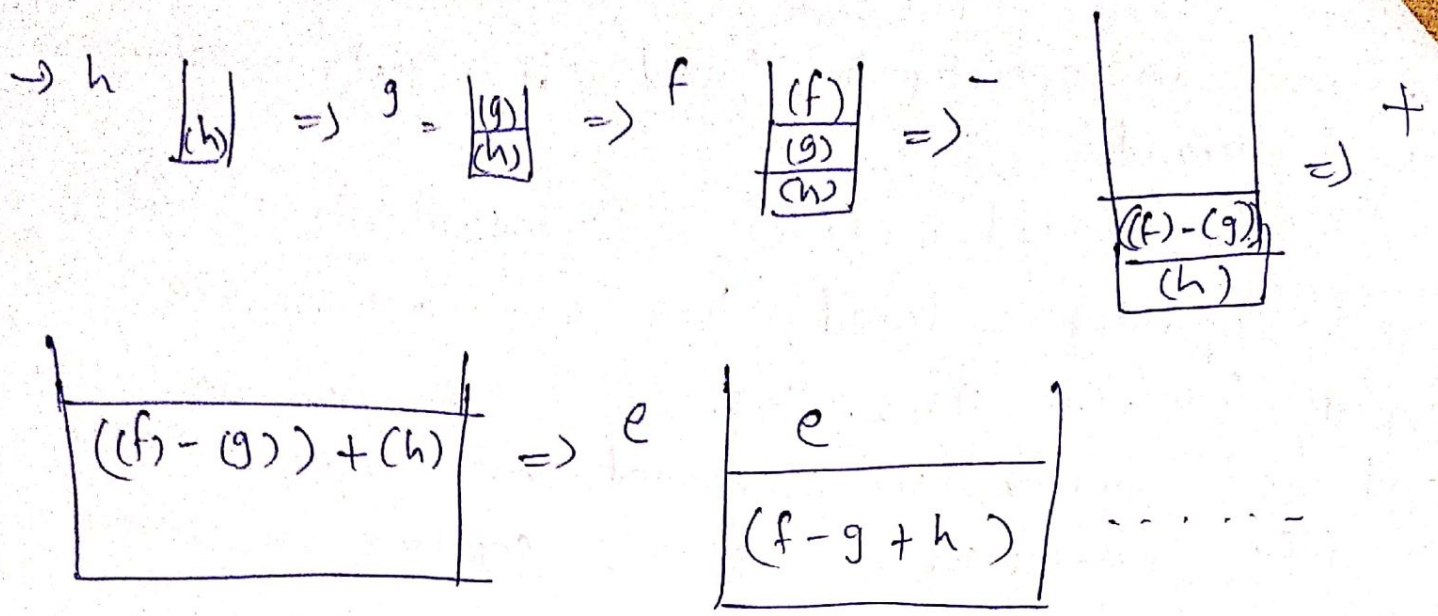
when operand is found it is pushed on to stack. When an operator is found, two sub-expressions are popped from the stack. These two sub-expressions and the operator being scanned are merger to create an infix sub-expression and this expression is pushed onto the stack,

Algorithm :

```
S1, S2 : string
st : stack of strings ;
initialize st ;
Prefix ← read the prefix expression ;
for ( i ← index of last character of prefix, down to 0)
{   x = prefix [i] ;
    if (x is operand)
        Push( st, x) ;
    else
    {   S1 = pop(st) ;
        S2 = pop(st) ;
        push( st, "(" + S1 + x + S2 + ")") ;
    }
}
find (top)
```

Example:

$* + a - b\ c\ / - d\ e\ + - f\ g\ h$



Final

$((a)+(b))-(c)) * ((d)-(e)) / ((f)-(g)+(h))$

Unit - 4

Conversion of Expression from prefix into postfix.

↳ Expression is scanned from right to left

↳ Whenever an ~~operand~~ operator is found, it is put after the two operands.

* + a - b c / - d e + - f g h

when ~~operater~~ ~~operand~~ is found, two sub-expressions are popped from the stack. These two sub-expressions and the operator being scanned are merged to create a postfix sub-expression and this expression is pushed onto the stack.

expression

* + a - b c / - d e + - f g h

* + a - b c / - d e + - f g

↳ - operator, pop two operands from stack.

⇒ fg - now put this on stack

stack

| empty |

| h |

| h \| g |

| h \| g \| f |

| h \| fg - |

+ , operator so pop two operands.

fg - h + put on to stack

| fg - h + |

pop e, put onto stack

d,

| fg - h + \| e \| d |

-, operator, pop two operands

de -

| fg - h + \| de - |

* + a - b c /

/ operator,

| de - fg - h + / |

c, b

| de - fg - h + / \| c \| b |

– operator, bc –

de-fg-h+/	bc –

a,

de-fg-h+/	bc-	a

+ operator,

abc-+

de-fg-h+/	abc-+

* operator,

~~de-fg-h+/abc-+*~~

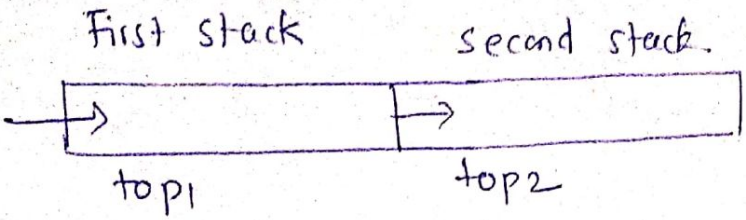
abc-+ de-fg-h+/*

End.

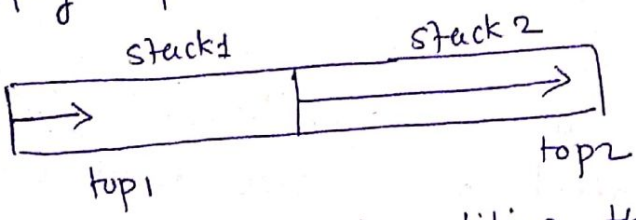
Algorithm for conversion from prefix to postfix.

```
S1,S2: string
st : stack of strings;
initialize st,
prefix ← read the prefix expression;
for( i ← index of the last character of prefix, down to 0)
   {  x = prefix[i];
      if( x is an operand)
            push(st, x);
      else
        {   s1 = pop();
            s2 = pop();
            push(st, s1+s2+x);
        }
   }
```

Representation of two stacks in an Array.



Array is divided into two equal parts. First part is reserved for stack1 and the second part is reserved for stack2. In such a division if a stack becomes full, it can not utilize the empty space of the other stack.



Stack2 is full and it cannot utilize the empty space of stack 1.

Second representation

First stack starts from the beginning whereas the second stack starts from the end. Empty space between two stacks can be utilized by either of the stacks. This form of representation minimizes the changes of overflow and hence it is superior over the first

Representation of Multiple stacks in an Array.

Several stacks can be stored in a single array. Suppose A[] is an array of size MAX and N number of stacks are to be stored in the array. MAX is predefined constant.

We can divide the available memory, A[0...MAX-1] into N segments. Each stack can be allocated one of these segments. For each stack I.

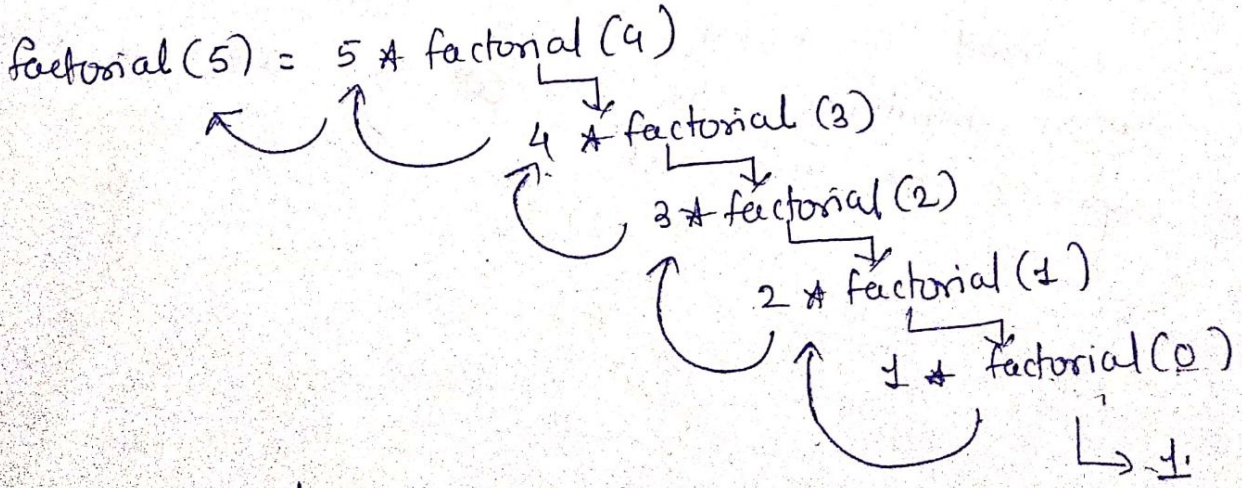
Recursion

Recursion : when a function is defined in terms of itself then it is called a recursive function.

Example. factorial of a positive integer n.

$$\text{Factorial}(n) = \begin{cases} 1 & \text{if } (n=0) \\ n * \text{factorial}(n-1), & \text{otherwise} \end{cases}$$

Function "factorial()" is defined in terms of itself for $n>0$. Value of the function at $n=0$ is 1, and it is called the base. Recursion terminates on reaching the base.

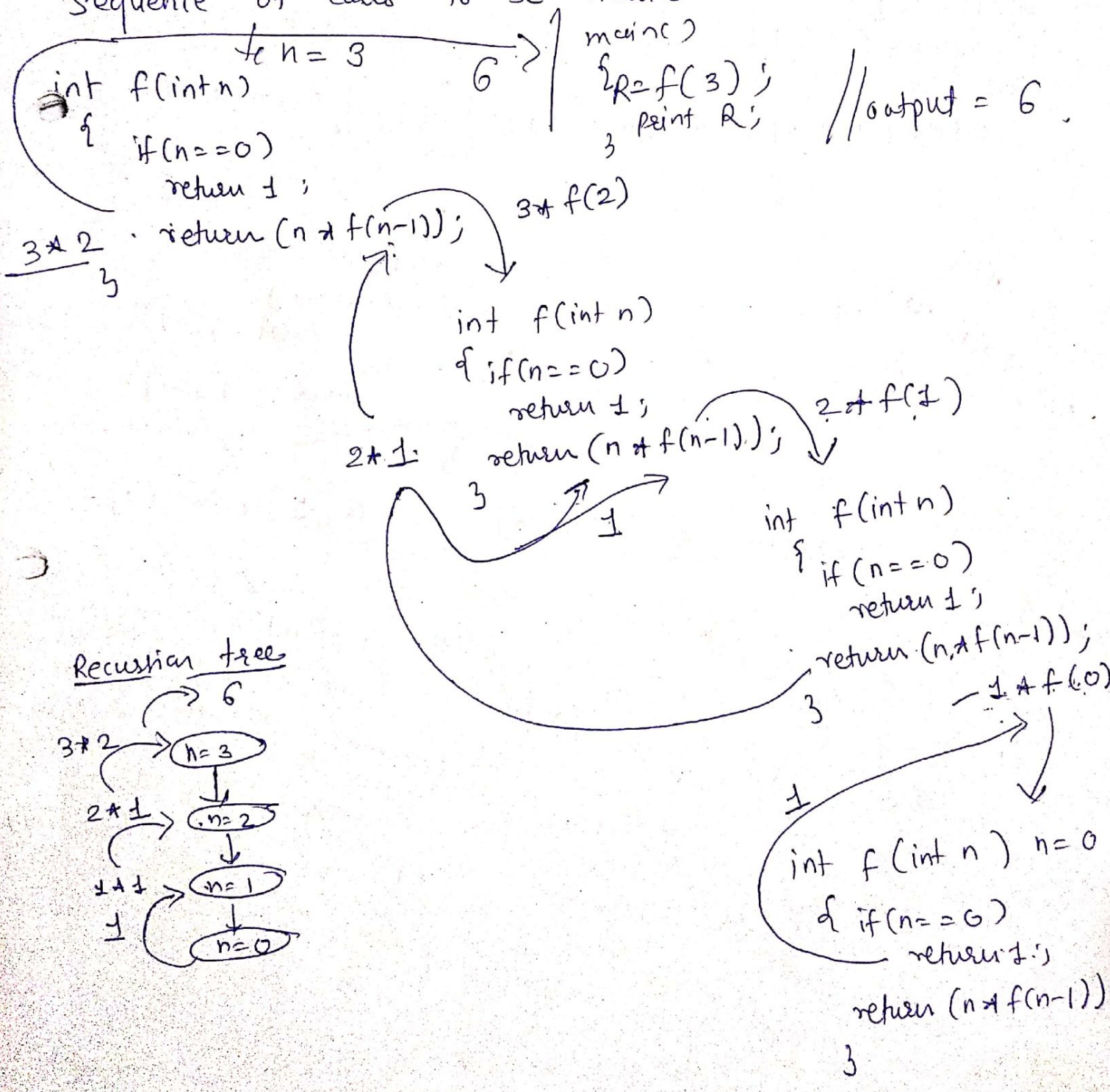


Recursion expands when $n>0$,
and it starts winding up on hitting the base ($n=0$).

function for finding factorial

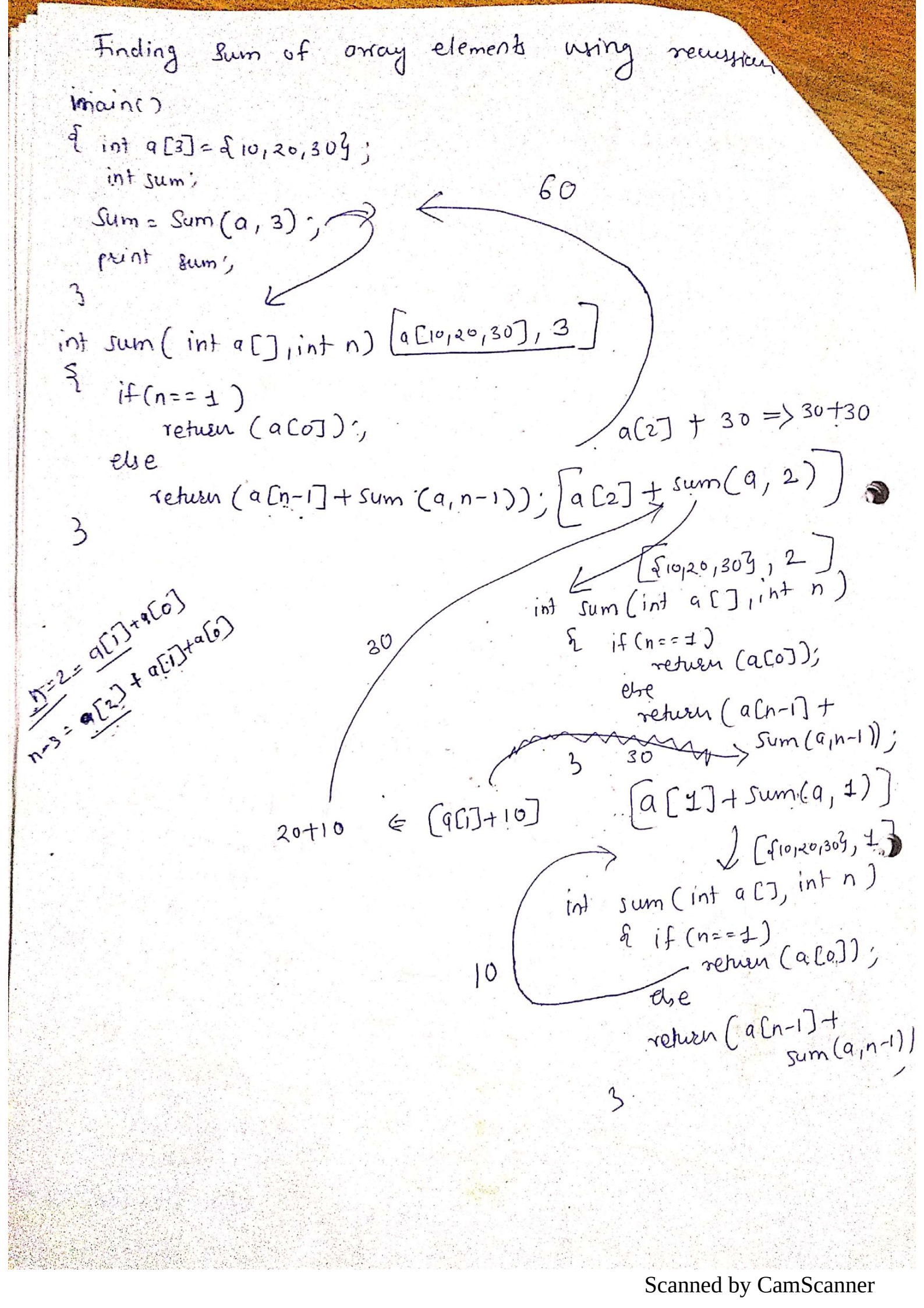
```
int factorial (int n)
{
    if(n==0)
        return 1;

    return (n * factorial (n-1));
}
```

Sequence of calls to be made is as below.



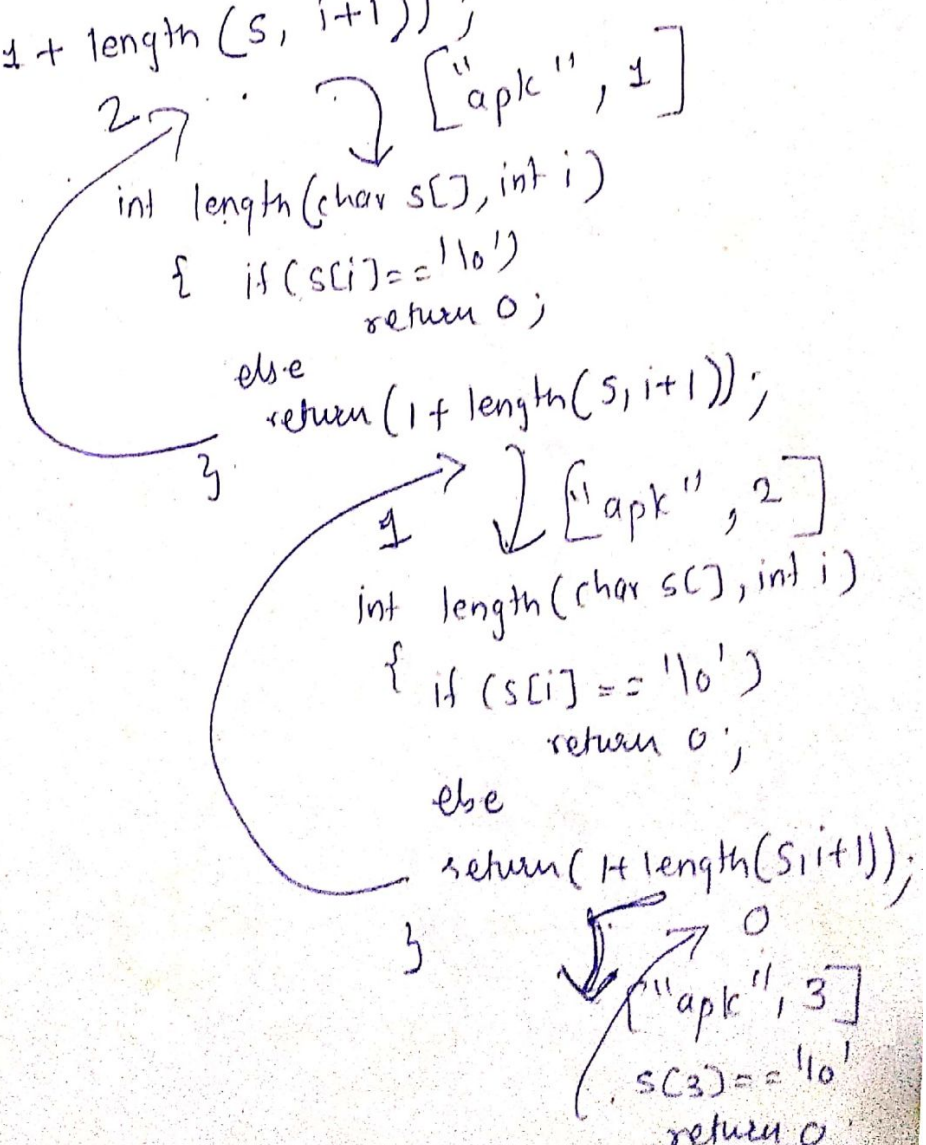
Finding Sum of array elements using recursion

```
main()
{ int a[3]={10,20,30};
  int sum;
  Sum = Sum(a, 3);
  print Sum;
}
int sum( int a[], int n)
{
  if(n==1)
     return (a[0]);
  else
     return (a[n-1]+sum(a,n-1));
}
```



Find Length of string using recursion.

```
main()
{ char str[3] = ['a', 'p', 'k'];
  int len;
  len = length(s, 0);
  printf("Length = %d", len);
}
int length(char s[], int i)
{
  if(s[i] == 'b')
    return 0;
  else
    return (1 + length(s, i+1));
}
```



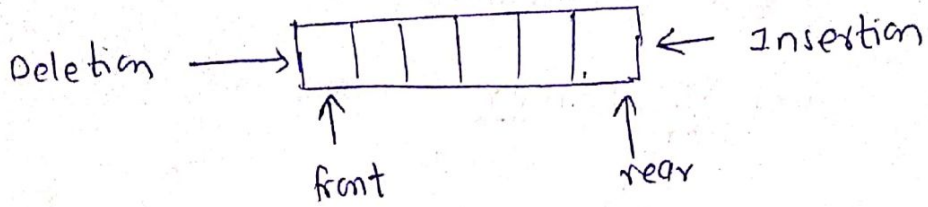
Reverse string using recussion

```
Void reverse (char *s, int i, int j)
{ // i → index of first character in string
  // j → index of last char in string.

    char temp;
    if (i<j)
    { temp = s[i];
      s[i] = s[j];
      s[j] = temp;
      reverse (s, i+1, j-1);

    }

}
```

UNIT V

Queues.

Queue is a FIFO (first in first out) list. It is a special kind of list where items are inserted at one end (the rear) and deleted from the other end (front).



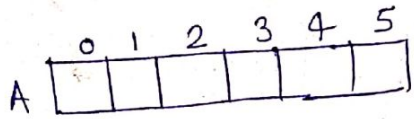
Applications of Queues

1. Scheduling of process (Round robin algorithm)
2. Spooling (to maintain a queue of jobs to be printed).

Initialization

front = rear = -1.

Example



MAX = 6, front = -1, rear = -1

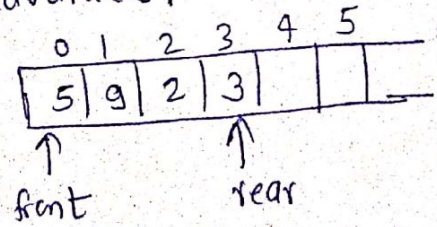
1) Insert 5 (x).

rear = rear+1 // rear = 0

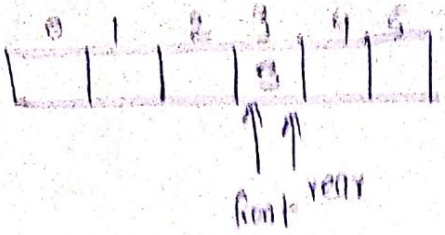
A[rear] = x

front = 0 so, front = 0, rear = 0

2) One subsequent insertions, front remains at the same place where rear advances.



3) A queue after deletion of 5, 9 & 2.



x = A[front]
front++;

rear is not changed.
front is incremented after each deletion.

when front = rear only one element is left in queue.

Points.

1) If the queue is empty front = -1 & rear = -1 // or just rear = -1.
2) If the queue is full then rear = MAX-1
3) If rear = front then queue contains just one element
4) If rear > front then queue is non-empty.

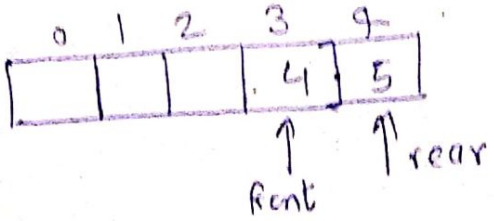


Fig: (a)

Overflow Problem : In above figure, the queue has became full as rear = MAX-1. There are 3 vacant spaces (locations 0,1,2) but these spaces can not be utilised.

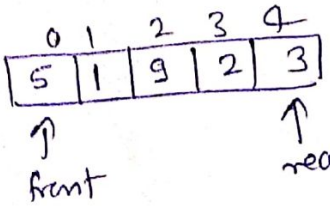
- This problem can be handled by moving the queue elements to their left by number of vacant spaces but this is very time consuming for large queue.

```
int front=-1, rear=-1;
#define MAX 10;
int data[MAX];
int empty();
int full();
void enqueue(int x);
int dequeue();
void print();

main()
{ int i,x
  front=rear=-1;
  printf("enter 5 elements");
  for(i=1; i<=5; i++)
  { scanf("%d", &x);
    if(!full())
      enqueue(x);
    else
    { printf("queue is full");
      exit(0);
    }
  }
  print();
  for(i=1; i<=2; i++)
  { if(!empty())
      x=dequeue();
    else
    { printf("cannot delete.. queue is empty");
      exit(0);
```

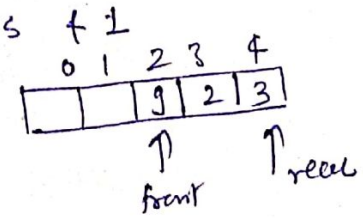
```
int empty()
{
    if (rear == -1)
        return 1;
    else return 0;
}
int full()
{
    if (rear == MAX-1)
        return 1;
    else
        return 0;
}
void enqueue(int x)
{
    if (rear == -1)
    {
        rear = front = 0;
        data[rear] = x;
    }
    else
    {
        rear = rear + 1;
        data[rear] = x;
    }
}
int dequeue()
{
    int x;
    x = data[front];
    if (front == rear) // only element
    {
        rear = front = -1;
    }
    else front = front + 1;
```

```
void print()
{
  int i;
  if (!empty())
  {
    for(i=front; i<=rear; i++)
    {
      printf("%d\t", data[i]);
    }
  }
}
```

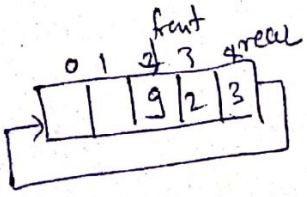
Circular Queue



Delete 5 & 1



rear = 4 Queue is still full though two vacant position at 0 & 1 are left. to conquer this problem circular queue is used.



New data 4 can insert at position 0,

To give a circular movement inside an array, whenever we go past the last element of the array, it should come back to the beginning of the array.

UNIT VI

Searching and Sorting.

Searching is a technique of finding an element in a given list of elements. List of elements could be represented using an

1. Array. 2. Linked List 3. A Binary Tree 4. A B-Tree 5. Heap.

- Sequential / Linear search

In sequential search elements are examined sequentially starting from the first element. The process of searching terminates when the list is exhausted or comparison results in a Sucess.

```
int sequential (int a[], int key, int n)
{  int i=0;
   while(i<n)
   {  if (a[i]==key)
         return i;
      else
         i++;
   }
   return -1;
}
```

Analysis

Best case: O(1)

Average/worst = O(n)

Binary Search : This algorithm is applicable only when given list is sorted.

```
int bin_search(int a[], int i, int j, int key)
{
    int c;
    c = (i+j)/2;
    while ( a[c] != key && i<=j )
    {
        if (key > a[c])
            i = c+1;
        else
            j = c-1;
        c = (i+j)/2;
    }
    if(i<=j)
        return c ; //successful
    else
        return -1 ; //unsuccessful,
}
```

Time complexity: $O(\log_2 n)$ ← average/worst

Best case : $O(1)$.

This method makes a comparison between the key and the middle element of the array. Since elements are sorted, comparisons may result in either a match or comparison could be continued with either left half of elements or right half of the elements.

Sorting.

Sorting is a process of ordering a list of elements in either ascending or descending order. Sorting categories,

1. Internal sorting
2. External sorting.

Internal Sorting : takes place in main memory of a computer.

External sorting : is carried on secondary storage. It becomes a necessity if the number of elements to be sorted is too large to fit in main memory.

Sort stability

A sorting algorithm is said to be stable if after sorting, identical elements appear in the same sequence as in the original unsorted list.

Example :

Mohan	65
Sohan	70
Mohan	68
Amit	74
Sohan	75

Stable sorted list ⟹

Amit	74
Mohan	65
Mohan	68
Sohan	70
Sohan	75

order preserved

Unstable sorted list ⟹

Amit	74
Mohan	68
Mohan	65
Sohan	70
Sohan	75

ordering changed

Stable sort example,

1. Bubble sort
2. Selection sort
3. Insertion sort
4. Merge sort.

Unstable sort Example

1. Quick sort
2. Heap sort
3. Shell sort.

Sort Efficiency

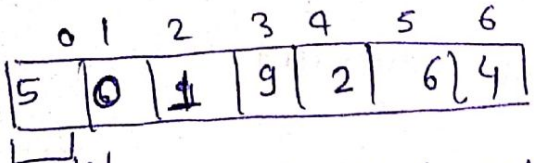
Some sorting methods are data sensitive & for such methods finding of exact number of comparisons becomes difficult. so.

1. Best case
2. Average case - with assumption that data distribution is random.
3. Worst case

Insertion Sort

An element can always be placed at a right place in sorted list of element.

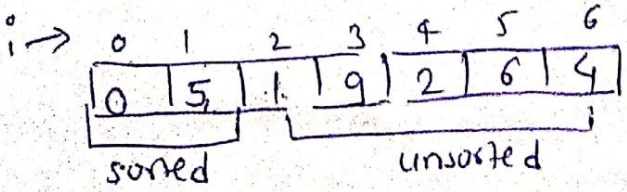
Example



1st iteration: A list of single element is always sorted, consider a[0] as sorted list.

Now, plaie a[1] at its correct place in sorted list.

a[1] = 0



2nd iteration place a[2] at correct place. i = 2

a[2] = 1

temp = a[i] = 1

j = i-1 = 1

a[j] > temp

a[j+1] = a[j]

0 1 5 9 2 6 4

Analysis of insertion sort:

with the above code Best case & Worst case complexity is $O(n^2)$.

but if we simplify above code as below then best case complexity = $O(n)$ instead of $O(n^2)$. because input list given is already sorted in case of best case and here, the test a[j] > temp will fail immediately in inner for loop. Thus only one comparison is made in each pass, so total no. of comparison = n-1. so $O(n)$.

```
void insertion_sort ( int a[], int n )
{ int i, j, temp ;
  for(i=1 ; i<n; i++)
  {  temp= a[i];
     for( j= i-1 ; j>=0 && a[j]>temp; j--)
     {
        a[j+1]= a[j];
     }
     a[j+1]= temp;
  }
}
```

1 2 3 4

Pass 1: 1 2 3 4 → position moved 0

Pass 2: 1 2 3 4 → position moved 0

Pass 3: 1 2 3 4 → position moved 0

In total it takes 0 time or constant time so in best case, time complexity is $O(n)$. i.e $O(n)$.

Worst case: Input is descending order list.

20 10 8 6

10 20 8 6 → Positions moved 1, Pass 1

8 10 20 6 → Positions moved 2, Pass 2

6 8 10 20 → Positions moved 3 Pass 3.

Total positions moved $= \sum_{i=1}^{n-1} i = \frac{n(n-1)}{2} = O(n^2)$

Best case → Total no. of comparisons = $n-1$ so $O(n)$.

$$\sum_{i=1}^{n-1} 1 = n-1 = O(n).$$

Example:

56 12 84 56 28 0 −13 47 94 31 12 −2

descending order = ?

→

94 84 56 56 47 31 28 12 12 0 −13 −2

Average case:

$$\sum_{i=1}^{n-1} i/2 = \frac{1}{2} \cdot \frac{n(n-1)}{2} = \frac{n^2-n}{4} = O(n^2).$$

Worst case $= \sum_{j=1}^{n-1} i = \frac{n(n-1)}{2} = O(n^2)$

Example:

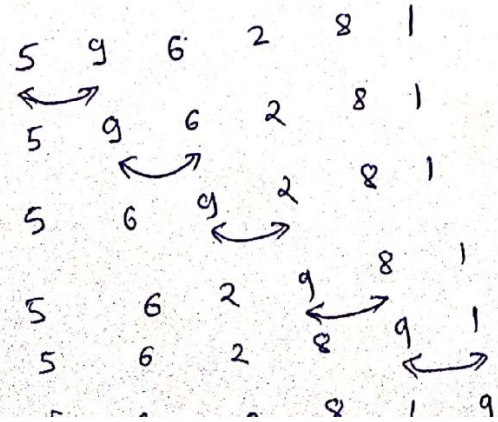
150 350 100 250 200 50 300

Bubble Sort:

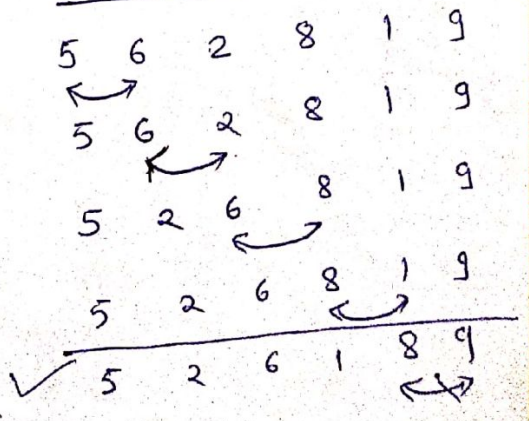
Bubble sort is one of the simplest & most popular sorting method. The basic idea behind bubble sort is a bubble rises up in water. The largest element goes to end in ascending sort. Small

$n = 6$ 5 9 6 2 8 1

Pass 1



Pass 2



Subject :- Basic Electronics Engg.

Class :- F.E. Sem I

Question Bank

Unit 1 – Diode circuits

1) Compare performance of half wave rectifier and full wave rectifier with respect to following parameters.
   1. I_{DC}
   2. V_{DC}
   3. I_{rms}
   4. Rectifier efficiency
   5. TUF
   6. PIV of diodes used
   7. Ripple factor
2) Draw the circuit of series negative clipper and explain its operation along with waveform.
3) Explain voltage tripler and quadrupler circuit.
4) Compare performance of half wave rectifier and full wave rectifier with respect to following parameters :
   1. I_{DC}
   2. I_{ms}
   3. Rectifier efficiency
   4. Ripple factor
   5. PIV
   6. TUF
5) Explain the working of positive clamper with its waveforms.
6) Explain the working of positive biased shunt clipper with its input and output waveforms.
7) Explain working principle of photodiode with characteristics. Why photodiode is operated in reverse biased mode when used as an optical detector?
8) State various materials used to fabricate LED's and also explains principle of operation of LED.
9) Write short notes on seven segment display.

Unit 2- Bipolar Junction Transistor Circuits

1) Explain with a circuit diagram a single stage common emitter amplifier. State the function of each component in the circuit.
2) Draw constructional details and explain operation and characteristics of n-channel MOSFET (enhancement type).
3) For a BJT as a switch why CB and CC configurations are not preferred?
4) Explain how R_0 and R_i affect the performance of the BJT voltage amplifier.
5) Explain working of transistor as a switch.
6) Define current amplification factor for CC, CB, and CE configuration.
7) Explain drain and transfer characteristics of enhancement type p-channel MOSFET.
8) Explain input output characteristics of CE amplifier.
9) Explain drain characteristics of an n-channel enhancement type MOSFET.
10) Explain how transistor can be used as an amplifier with the help of D.C. load line approach.
11) Explain the operation of n-channel enhancement type MOSFET with its characteristics.
12) What is dc load line? Explain the role of Q-point on dc load line.
13) Differentiate between CB, CE and CC configurations.

Unit 3:-Operational Amplifier

1) What is OP-AMP? Draw &Explain the functional block diagram of an OPAMP.
2) Draw the circuit diagram and write the output equation for :
    1. Inverting summer with three inputs.
    2. Ideal differentiator.
3) Explain the working of inverting summing amplifier with two inputs along with its waveforms.
4)) Define following parameter of OP-AMP:
    1. B.W. 2. PSRR 3.CMRR
5) With the help of block diagram of IC 555 explain operation in astable mode.
6) Draw & explain internal block diagram of IC 555.
7) Draw three pin IC voltage regulator .Define load & line regulation.

Unit-4 Digital Electronics

1) State and prove the De-Morgan's theorems. Use De-Morgan's theorem to simplify the following Boolean expression.

Y=

2) Give comparisons between the microprocessor and microcontroller.
3) Draw the schematic diagram and explain working of 4:1 mux and 1:4 demux.
4) Explain the operation of multiplexer and demultiplexer.
5) State and prove the De-Morgan's theorem. Simplify the following expression:
6) State the IC number for the following two input logic gate:

1. AND 2.NOR 3. NAND 4.EX-OR 5. OR 6. NO

Unit-5 Power Device

1) Draw construction diagram and explain the working with the help of transistor equivalent circuit of SCR. Also draw its V-I characteristics.
2) Draw construction diagram and explain the V-I characteristics of a TRAIC. What are the applications of a TRAIC?
3) Explain in detail.
    1. Construction of TRIAC 2. Characteristics of TRAIC. 3. Modes of operation.
4) Explain the construction of DIAC with respect to
    1. Characteristics 2.Applications
5) Draw and explain operation of SCR using two transistor equivalent circuit.
6) Draw constructional diagram and explain working of V-I characteristic of diac.
7) Explain construction of SCR.
8) Explain characteristics of DIAC.
9) Explain the operation of SCR with the help of V-I characteristics.
10) Explain the construction of DIAC and draw its characteristics.

11) Compare
    1. SCR and TRIAC.
    2. DIAC and TRIAC.
12) With a neat diagram explain the construction and working of LVDT. Give its advantages, disadvantages and applications.
13) Draw and explain block diagram of instrumentation system.
14) Explain with block diagram digital thermometer.
15) Explain varies criteria used to select a transducer.
16) Define 'Dark current '. Draw and explain the characteristics of phototransistor.

Unit 6 – Electronic Communication

1) Draw and explain the block diagram of an electronic communication system.
2) What is the need of modulation? What are the different types of modulation?
3) Draw waveforms and explain amplitude modulation technique. Write the expression of AM and define modulation index.
4) Draw and explain the block diagram of GSM.
5) What is the importance of modulation index? Draw the AM waveform for
    1. Liner modulation
    2. Over modulation
    3. Modulation index = 0.
6) Explain the basic structure of mobile phone system.
7) With respect to FM explain
    1. Frequency deviation
    2. Modulation index
    3. Deviation ratio
    4. Frequency spectrum of FM
8) Write a note on co-axial cable and optical fibre cable.
9) What is baseband communication? Explain limitation of baseband communication and need for modulation.
10) Write a note on optical fiber and explain how light travels through a fiber?
11) Draw and explain the electromagnetic or IEEE frequency spectrum. List its applications.
12) Compare AM and FM.
13) With a neat diagram explain the construction and working of LVDT. Give its advantages, disadvantages and applications.
14) Draw and explain block diagram of instrumentation system.
15) Explain with block diagram digital thermometer.
16) Explain varies criteria used to select a transducer.
17) Define 'Dark current '. Draw and explain the characteristics of phototransistor
18) Define Active Transducers & passive Transducers
19) Explain any two types of displacement Transducers

Prof. J. J. Bandal
Subject Teacher

10. PERSONNEL ATTENTION IN LEARNING THROUGH TEACHER-GUARDIAN

Div.	Batch
SE	S2

Rajgad Dnyanpeeth's

RAJGAD DNYANPEETH TECHNICAL CAMPUS

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

S.No.237, Dhangwadi, Tal-Bhor, Dist-Pune.

GUARDIAN TEACHER SCHEME

ACADEMIC YEAR 2017 - 2018

SEMESTER I

Name of Staff: Prof. Jadhav Sunil M.

Department: Computer Mob. No. 9923991525

SEMESTER II

Name of Staff: Prof. Jadhav Sunil M.

Department: Computer Mob. No. 9923991525

Div.	Batch
SE	S-2

Rajgad Dnyanpeeth's

RAJGAD DNYANPEETH TECHNICAL CAMPUS

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

S.No.237, Dhangwadi, Tal-Bhor, Dist-Pune.

GUARDIAN TEACHER SCHEME

ACADEMIC YEAR 20 - 20

SEMESTER I

Name of Staff: Prof. Jadhav S.M.

Department: Computer Mob. No. 9923991525

SEMESTER II

Name of Staff: Prof. Jadhav S.M.

Department: Computer Mob. No. 9923991525

CONTENTS		
Sr. No.	Particulars	Page No.

List of Students (S2)

Roll No.	Name of Students	Branch
19	Pawar Snehal Laxman	Computer Engineering
20	Pawar Trupti Vikas	
21	Pawar Vaishali Sanjay	
22	Phadnis Swapnali Sudhir	
23	Phase Vishakha Audumbar	
24	Raman Snehal Ravindra	
25	Salekar Rupali Balu	
26	Salunke Pragati Sampat	
27	Sathe Sunny Somnath	
28	Shaikh Tammanna Anwar	
29	Shinde Tejaswini Popat	
30	Shivankar Ankita Vinayak	
31	Surve Ashlesha Devidas	
32	Surve Omkar Shashank	
33	Thakare Priyanka Shashikant	
34	Yadav Krishna Ramdhani	
35	Yadav Prajwal Shankar	
36	Yadav Tanuja Dnyaneshwar	

STUDENT INFORMATION

Roll No. 21 **Batch:** S2

Name and Address of student Pawar vaishali Sanjay
AP. Shivani Tal - Kadegaon Dist - Sangali

Mobile No : 9146 099 749 Date of Birth: 5/10/1979

Name and Address of Parents: Pawar Sanjay Parashram

Mobile No. : 9503773552

Name and Address of Guardian: Same as above (Address)
Pawar Sanjay D.

Mobile No. : —

Relation with Local Guardian : — —

STUDENT INFORMATION

Roll No. 22 **Batch:** S2

Name and Address of student Phadnis Swapnali Sudhir

Mobile No : 9665492628 Date of Birth: 07/06/1997

Name and Address of Parents: A.T. Post Aundh Tal - Khatav
Dist satara.

Mobile No. : 9665381588

Name and Address of Guardian: Mr. Sudhir R. Phadnis
(Address - same as above)

Mobile No. :

Relation with Local Guardian :

STUDENT INFORMATION

Roll No. 31 **Batch:** – S2

Name and Address of student: Surve Ashlesha Devidas

Mobile No : 9922088056 Date of Birth: 14 Aug 1998

Name and Address of Parents: AT-Gawadi, Post-Shind, Tal-Bhor. Dist-Pune

Mobile No. : 9175968200

Name and Address of Guardian: Devidas Dattaram Surve At-Gawadi, Post-Shind, Tal-Bhor, Dist-Pune.

Mobile No. : –

Relation with Local Guardian : –

STUDENT INFORMATION

Roll No. 32 **Batch:** – S2

Name and Address of student: Surve Omkar Shashank

Mobile No : 7045317595 Date of Birth: 19/3/1996

Name and Address of Parents: C-003/10, Varmali Bldg, Krishnasthal complex, Mira road (E), Thane -

Mobile No. : 9769792524

Name and Address of Guardian: – same as above (Address) Mr. Shashank Surve

Mobile No. : –

Relation with Local Guardian : –

Rajgad Dnyanpeeth's

RAJGAD DNYANPEETH TECHNICAL CAMPUS

Shri Chhatrapati Shivajiraje College of Engineering

DEPARTMENT OF COMPUTER ENGINEERING

Academic Year :2017-18

SEMESTER - I

Class:- SE

w.e.f 27/06/2017

Time/Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
10:00- 11:00	DSA ASS CR-215	DELD SMJ CR-215	DELD SMJ CR-215	DM MBW CR-215	COA RBN CR-215	
11:00- 12:00	DM MBW CR-215	OOP PSN CR-215	OOP PSN CR-215	OOP PSN CR-215	DSA ASS CR-215	
12:00-12:45	**LONG RECESS**					
12:45- 01:45	COA APJ CR-215	DM MBW CR-215	DSA ASS CR-215	S1-DSL-(ASS) S2-DEL- (SMJ)	OOP PSN CR-215	
01:45- 02:45	DELD SMJ CR-215	COA APJ CR-215	DM MBW CR-215		DELD SMJ CR-215	
02:45 - 03:00	**SHORT RECESS**					
03:00- 04:00	S1-DSL- (ASS) S2-OOPL- (PSN)	S1-DEL- (SMJ) S2-SSL- (MBW)	S1-OOPL- (PSN) S2-DSL- (ASS)	DSA ASS CR-215	S1-SSL- MBW) S2-DSL- (ASS)	
04:00- 05:00				COA APJ CR-215		

Class Teacher:-Prof. A. S. Sondkar

Staff Name	Theory Subjects	Practical Subjects	Lab Location
MBW- Prof. M.B. Wagh	DM - Discrete Mathematics	SSL - Soft Skills Lab	Operating System Lab
ASS-Prof.A.S.Sondkar	DSA - Data Structures and Algorithms	DSL- Data structures Lab	Database Lab
APJ-Prof.A.P.Jagtap	COA - Computer Organization & Architecture		
PSN - Prof. P.S.Nagale	OOP - Object Oriented Programming	OOPL-Object Oriented Programming Lab	Programming Lab
SMJ - Prof. S.M.Jadhav	DELD - Digital Electronics and Logic Design	DEL- Digital Electronics &Logic Design Lab	Hardware Lab

Prof. M.M More
TT - Coordinator

RDTC, Shri Chhatrapati Shivajiraje College of Engineering, Pune — Comp. Engg. Dept.

Prof. M.B.Wagh
Head of Department

Dr. S.B. Patil
Principal

Rajgad Dnyanpeeth's

SHRI CHHATRAPATISHIVAJIRAJE COLLEGE OF ENGINEERING

S. No. 237, Dhangawadi, Tal- Bhor, Dist- Pune,

Ref. No. – RDTC/SCSCOE/COMP/2017-18/

Date: 27/03/2017

From,

Department of Computer Engineering
Rajgad Dnyanpeeth's
Shri Chhatrapatishivajiraje College Of Engineering
Dhangawadi, Tal- Bhor, Dist- Pune,

Dear Parent(s)/Guardian:

Attendance is an essential component to a student's academic success. This letter is to inform you that your Student has accumulated at least 75% attendancs. At this time, you and your child have an opportunity to work towards improving attendance.

We look forward to working with you to improve Student attendance. Please contact us if there is any way that we can assist in this process. Thank you in advance for your support and cooperation.

Sincerely,

Prof. Sunil Jadhav

Teacher Guardian
Class: SE(Batch S2)

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Rajgad Dnyanpeeth's

RAJGAD DNYANPEETH TECHNICAL CAMPUS

Shri Chhatrapati Shivajiraje College of Engineering

DEPARTMENT OF COMPUTER ENGINEERING

Academic Year :2017-18

SEMESTER - II

Class:- SE

w.e.f 20/12/2017

Time/Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
10:00- 11:00	EM-III YGJ CR-215	CG MBW CR-215	PPL SAB CR-215	MICRO SMJ CR-215	ADS ASS CR-215	
11:00- 12:00	MICRO SMJ CR-215	CG MBW CR-215	MICRO SMJ CR-215	CG MBW CR-215	PPL SAB CR-215	
12:00-12:45	**LONG RECESS**					
12:45- 01:45	ADS ASS CR-215	S1-MICROL- (SMJ) S2-ADSL- (ASS)	CG MBW CR-215	S1-ADSL-(ASS) S2-MICROL- (SMJ)	EM-III YGJ CR-215	
01:45- 02:45	PPL SAB CR-215		ADS ASS CR-215		MICRO SMJ CR-215	
02:45 - 03:00	**SHORT RECESS**					
03:00- 04:00	S1-ADSL- (ASS) S2-MICROL- (SMJ)	ADS ASS CR-215	S1-CGL- (APJ) S2-ADSL- (ASS)	EM-III YGJ CR-215	S1-MICROL- (SMJ) S2-CGL- (APJ)	
04:00- 05:00		EM-III YGJ CR-215		EM-III(TUT) YGJ CR-215		

Class Teacher:-Prof. A. S. Sondkar

Staff Name	Theory Subjects	Practical Subjects	Lab Location
MBW - Prof. M.B.Wagh	CG-Computer Graphics		
ASS-Prof.A.S.Sondkar	ADS-Advanced Data Structures	ADSL- Advanced Data structures Lab	Database Lab
SMJ - Prof. S.M.Jadhav	MICRO-Microprocessor	MICROL-Microprocessor Lab	Network Lab
SAB- Prof. S.A. Bhuskute	PPL-Principles of Programming Language		
APJ-A.P.Jagtap		CGL-Computer Graphics Lab	Programming Lab
YGJ-Prof.Y.G.Jadhav	EM-III-Engineering Mathemathematics -III		

Prof. M.M More
TT - Coordinator

Prof. M.B.Wagh
Head of Department

Dr. S.B. Patil
Principal

Rajgad Dnyanpeeth's

SHRI CHHATRAPATISHIVAJIRAJE COLLEGE OF ENGINEERING

S. No. 237, Dhangawadi, Tal- Bhor, Dist- Pune,

Ref. No. – RDTC/SCSCOE/COMP/2017-18/SE

Date: 01/01/18

From,

Department of Computer Engineering
Rajgad Dnyanpeeth's
Shri Chhatrapatishivajiraje College Of Engineering
Dhangawadi, Tal- Bhor, Dist- Pune,

Dear Parent(s)/Guardian:

Attendance is an essential component to a student's academic success. This letter is to inform you that your Student has accumulated at least 75% attendancs. At this time, you and your child have an opportunity to work towards improving attendance.

We look forward to working with you to improve Student attendance. Please contact us if there is any way that we can assist in this process. Thank you in advance for your support and cooperation.

Sincerely,

Prof. Sunil Jadhav

Teacher Guardian
Class: SE(Batch S2)

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Telephone Record : Semester II				
Roll No.	Date	Time	Call Received by	Instructions / Discussio (In Short)
21	01/01/18	3'50 PM	Student Vaishali	College starting
23	01/01/18	3:05 PM	Parent	Time Table of Sem-II
23	1/1/18	3:07 PM	Student	College starting
25	01/01/18	3:09	Student	Lecture starting Date
27	01/01/18	3:10	parent	Lecture & partical Starting Date
30	01/01/18	3:11	Student	about College Star
32	01/01/18	3:12	Student	College start Dat
35	01/02/18	3:14	Student	about college sta
36	01/02/18	3:20	parent	Sem-II Time Tabl
20	08/01/18	12:00 PM	Student	Lecture & Practica Attendance
25	08/1/18	12:10	Student	Regular starting of Lecture & Pract
26	8/1/18	12:13	Student	Practical Attendan
27	8/1/18	12:14	Student	Attend Regular
28	8/1/18	12:15	Student	about the attendo
30	8/1/18	12:17	Student	Practical assignm
33	8/1/18	12:19	Student	about the Lecture Practical

Rajgad Dnyanpeeth's

Shri Chhatrapati Shivajiraje College of Engineering, Dhangwadi, Pune

Department of Computer Engineering

Academic Year 2017-18 | Semester-II

Class: SE | Batch: S2

Monthly attendance 18th Dec 2017 To 17th Jan 2018

Sr. No.	Roll. No.	Name of the Student	EM-III	%	CG	%	ADS	%	MP	%	PPL	%	DEL	%	CGL	%	ADSL	%	ML	%	Total Hrs	%
		Total Lect. Conducted	17		16		14		13		10		4		10		4		3		91	
1	1722019	Pawar Snehal Laxman	15	88.2	15	93.8	9	64.3	12	92.3	6	60.0	2	50.0	7	70.0	1	25.0	2	66.7	69	75.8
2	1722020	Pawar Trupti Vikas	2	11.8	0	0.0	1	7.1	2	15.4	1	10.0	2	50.0	7	70.0	2	50.0	2	66.7	19	20.9
3	1722021	Pawar Vaishali Sanjay	15	88.2	11	68.8	10	71.4	10	76.9	8	80.0	3	75.0	8	80.0	2	50.0	2	66.7	69	75.8
4	1722022	Phadnis Swapnali Sudhir	14	82.4	12	75.0	9	64.3	9	69.2	4	40.0	2	50.0	7	70.0	2	50.0	2	66.7	61	67.0
5	1722023	Phase Vishakha Audumbar	15	88.2	14	87.5	12	85.7	10	76.9	8	80.0	4	100.0	7	70.0	2	50.0	2	66.7	74	81.3
6	1722024	Roman Snehal Ravindra	8	47.1	6	37.5	7	50.0	6	46.2	3	30.0	2	50.0	7	70.0	3	75.0	2	66.7	44	48.4
7	1722025	Salekar Rupali Balu	14	82.4	14	87.5	10	71.4	10	76.9	7	70.0	2	50.0	6	60.0	3	75.0	3	100.0	69	75.8
8	1722026	Salunke Pragati Sampat	15	88.2	12	75.0	12	85.7	12	92.3	4	40.0	3	75.0	7	70.0	4	100.0	2	66.7	71	78.0
9	1722027	Sathe Sunny Somnath	14	82.4	14	87.5	10	71.4	10	76.9	6	60.0	2	50.0	8	80.0	3	75.0	3	100.0	70	76.9
10	1722028	Shaikh Tamanna Anwar	13	76.5	12	75.0	10	71.4	12	92.3	7	70.0	4	100.0	7	70.0	3	75.0	3	100.0	71	78.0
11	1722029	Shinde Tejaswini Popat	12	70.6	15	93.8	12	85.7	11	84.6	9	90.0	2	50.0	5	62.5	3	100.0	3	100.0	72	81.8
12	1722030	Shivankar Ankita Vinayak	14	82.4	13	81.3	10	71.4	10	76.9	7	70.0	2	50.0	6	75.0	3	100.0	3	100.0	68	77.3
13	1722031	Surve Ashlesha Devidas	15	88.2	14	87.5	12	85.7	10	76.9	8	80.0	4	100.0	7	87.5	3	100.0	3	100.0	76	86.4
14	1722032	Surve Omkar Shashank	15	88.2	13	81.3	11	78.6	12	92.3	8	80.0	4	100.0	7	87.5	3	100.0	3	100.0	76	86.4
15	1722033	Thakare Priyanka Shashikant	16	94.1	12	75.0	10	71.4	13	100.0	8	80.0	4	100.0	10	100.0	4	100.0	4	133.3	81	92.0
16	1722034	Yadav Krishna Ramdhani	14	82.4	12	75.0	8	57.1	9	69.2	6	60.0	1	25.0	6	60.0	3	75.0	3	100.0	62	70.5
17	1722035	Yadav Prajwal Shankar	12	70.6	10	62.5	9	64.3	10	76.9	6	60.0	3	75.0	6	60.0	2	50.0	2	66.7	60	65.9
18	1722036	Yadav Tanuja Dnyaneshwar	5	29.4	6	37.5	8	57.1	9	69.2	5	50.0	2	50.0	4	40.0	2	50.0	2	66.7	43	47.3

Prof. A. S. Sondkar
Class Teacher

Rajgad Dnyanpeeth's ★ Shivajiraje College of Engg. DTE: 6324 SPPU: 4071 Dhangawadi Pune 412205

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AMC Coordinator

Prof. M. B. Wagh
HOD

Rajgad Dnyanpeeth's

Shri Chhatrapati Shivajiraje College of Engineering, Dhangwadi, Pune

Department of Computer Engineering

Academic Year 2017-18 Semester-II

Class: SE Batch: S2

Monthly attendance 18th Dec 2017 To 17th Feb 2018

Sr. No.	Roll. No.	Name of the Student	EM-III	%	CG	%	ADS	%	MP	%	PPL	%	DEL	%	CGL	%	ADSL	%	ML	%	Total Hrs	%
		Total Lect. Conducted	32		31		30		27		25		7		18		9		8		187	
1	1722019	Pawar Snehal Laxman	28	87.5	28	90.3	28	93.3	21	77.8	20	80.0	7	100.0	8	100.0	5	100.0	5	62.5	150	80.2
2	1722020	Pawar Trupti Vikas	20	62.5	22	71.0	26	86.7	25	92.6	20	80.0	4	57.1	7	87.5	5	100.0	5	62.5	134	71.7
3	1722021	Pawar Vaishali Sanjay	26	81.3	26	83.9	25	83.3	24	88.9	20	80.0	4	57.1	6	75.0	4	80.0	4	50.0	139	74.3
4	1722022	Phadnis Swapnali Sudhir	28	87.5	24	77.4	28	93.3	26	96.3	14	56.0	6	85.7	8	100.0	5	100.0	5	62.5	144	77.0
5	1722023	Phase Vishakha Audumbar	27	84.4	26	83.9	25	83.3	25	92.6	20	80.0	5	71.4	5	62.5	3	60.0	3	37.5	139	74.3
6	1722024	Roman Snehal Ravindra	27	84.4	25	80.6	20	66.7	25	92.6	21	84.0	6	85.7	6	75.0	5	100.0	5	62.5	140	74.9
7	1722025	Salekar Rupali Balu	28	87.5	27	87.1	24	80.0	23	85.2	24	96.0	4	57.1	2	25.0	3	60.0	3	37.5	138	73.8
8	1722026	Salunke Pragati Sampat	25	78.1	19	61.3	26	86.7	22	81.5	20	80.0	5	71.4	7	87.5	3	60.0	6	75.0	133	71.1
9	1722027	Sathe Sunny Somnath	8	100.0	9	100.0	8	80.0	8	80.0	5	55.6	1	50.0	3	75.0	3	100.0	3	37.5	48	76.2
10	1722028	Shaikh Tamanna Anwar	8	100.0	7	77.8	7	70.0	8	80.0	8	88.9	1	50.0	3	75.0	2	66.7	3	37.5	47	74.6
11	1722029	Shinde Tejaswini Popat	8	100.0	7	77.8	8	80.0	9	90.0	7	77.8	1	50.0	4	100.0	2	66.7	2	25.0	48	76.2
12	1722030	Shivankar Ankita Vinayak	7	87.5	7	77.8	9	90.0	7	70.0	7	77.8	1	50.0	3	75.0	1	33.3	6	75.0	48	76.2
13	1722031	Surve Ashlesha Devidas	6	75.0	8	88.9	7	70.0	8	80.0	8	88.9	2	100.0	3	75.0	2	66.7	4	50.0	48	76.2
14	1722032	Surve Omkar Shashank	6	75.0	7	77.8	8	80.0	8	80.0	7	77.8	2	100.0	2	50.0	3	100.0	3	37.5	46	73.0
15	1722033	Thakare Priyanka Shashikant	29	90.6	24	77.4	27	90.0	23	85.2	21	84.0	6	75.0	9	56.3	7	87.5	7	87.5	153	82.7
16	1722034	Yadav Krishna Ramdhani	25	78.1	24	77.4	20	66.7	22	81.5	16	64.0	5	62.5	9	56.3	6	75.0	6	75.0	133	71.9
17	1722035	Yadav Prajwal Shankar	8	100.0	9	100.0	8	80.0	8	80.0	5	55.6	1	50.0	3	75.0	3	100.0	3	37.5	48	76.2
18	1722036	Yadav Tanuja Dnyaneshwar	8	100.0	9	100.0	6	60.0	7	70.0	8	88.9	2	100.0	4	100.0	2	66.7	2	25.0	48	76.2

Prof. A. S. Sondkar
Class Teacher

Rajgad Dnyanpeeth's ★ Shri Chhatrapati Shivajiraje College of Engg. ★ Dhangawadi, Pune DTE: 6324 SPPU: 4071 A122025

Prof. A. S. Sondkar
AMC Coordinator

Prof. M. B. Wagh
HOD

Rajgad Dnyanpeeth's

Shri Chhatrapati Shivajiraje College of Engineering, Dhangwadi, Pune

Department of Computer Engineering

Academic Year 2017-18 | Semester-II

Class: SE | Batch: S2

Monthly attendance 18th Dec 2017 To 13th April 2018

Sr. No.	Roll. No.	Name of the Student	EM-III	%	CG	%	ADS	%	MP	%	PPL	%	DEL	%	CGL	%	ADSL	%	ML	%	Total Hrs	%
		Total Lect. Conducted	53		56		54		51		49		13		26		13		13		328	
1	1722019	Pawar Snehal Laxman	47	88.7	44	78.6	43	79.6	46	90.2	44	89.8	11	84.6	23	88.5	11	84.6	11	84.6	280	85.4
2	1722020	Pawar Trupti Vikas	47	88.7	45	80.4	43	79.6	43	84.3	44	89.8	11	84.6	23	88.5	10	76.9	10	76.9	276	84.1
3	1722021	Pawar Vaishali Sanjay	50	94.3	46	82.1	49	90.7	47	92.2	45	91.8	10	76.9	23	88.5	9	69.2	9	69.2	288	87.8
4	1722022	Phadnis Swapnali Sudhir	46	86.8	46	82.1	42	77.8	46	90.2	40	81.6	10	76.9	21	80.8	8	61.5	8	61.5	267	81.4
5	1722023	Phase Vishakha Audumbar	22	41.5	26	46.4	24	44.4	24	47.1	25	51.0	8	61.5	9	34.6	7	53.8	7	53.8	152	46.3
6	1722024	Roman Snehal Ravindra	48	90.6	46	82.1	48	88.9	48	94.1	47	95.9	8	61.5	18	69.2	8	61.5	8	61.5	279	85.1
7	1722025	Salekar Rupali Balu	47	88.7	47	83.9	47	87.0	47	92.2	43	87.8	11	84.6	17	65.4	9	69.2	9	69.2	277	84.5
8	1722026	Salunke Pragati Sampat	49	92.5	50	89.3	50	92.6	45	88.2	44	89.8	9	69.2	16	61.5	9	69.2	9	69.2	281	85.7
9	1722027	Sathe Sunny Somnath	36	67.9	39	69.6	40	74.1	49	96.1	44	89.8	11	84.6	14	53.8	7	53.8	8	61.5	248	75.6
10	1722028	Shaikh Tamanna Anwar	47	88.7	48	85.7	47	87.0	48	94.1	44	89.8	9	69.2	18	69.2	8	61.5	8	61.5	277	84.5
11	1722029	Shinde Tejaswini Popat	49	92.5	46	82.1	50	92.6	50	98.0	38	77.6	11	84.6	18	69.2	9	69.2	9	69.2	280	85.4
12	1722030	Shivankar Ankita Vinayak	48	90.6	48	85.7	47	87.0	49	96.1	44	89.8	10	76.9	17	65.4	9	69.2	9	69.2	281	85.7
13	1722031	Surve Ashlesha Devidas	48	90.6	47	83.9	42	77.8	49	96.1	45	91.8	9	69.2	18	69.2	8	61.5	8	61.5	274	83.5
14	1722032	Surve Omkar Shashank	49	92.5	49	87.5	46	85.2	47	92.2	48	98.0	11	84.6	14	53.8	6	46.2	6	46.2	276	84.1
15	1722033	Thakare Priyanka Shashikant	41	77.4	41	73.2	44	81.5	46	90.2	44	89.8	9	69.2	19	73.1	7	53.8	7	53.8	258	78.7
16	1722034	Yadav Krishna Ramdhani	45	84.9	44	78.6	43	79.6	48	94.1	42	85.7	11	84.6	22	84.6	10	76.9	10	76.9	275	83.8
17	1722035	Yadav Prajwal Shankar	48	90.6	47	83.9	47	87.0	46	90.2	41	83.7	10	76.9	22	84.6	10	76.9	10	76.9	281	85.7
18	1722036	Yadav Tanuja Dnyaneshwar	47	88.7	44	78.6	43	79.6	46	90.2	44	89.8	11	84.6	23	88.5	11	84.6	11	84.6	280	85.4

Prof. A. S. Sondkar
Class Teacher

Rajgad Dnyanpeeth's ★ Shri Chhatrapati Shivajiraje College of Engg. ★ DTE: 6324 SPPU: 4071 Dhangawadi Pune 412205

Prof. A. S. Sondkar
AMC Coordinator

Prof. M. B. Wagh
HOD

Rajgad Dnyanpeeth's

Shri Chhatrapati Shivajiraje College of Engineering, Dhangwadi, Pune

Department of Computer Engineering

Academic Year 2017-18

Class: SE

Semester-II

Batch: S2

Monthly attendance 18th Dec 2017 To 17th March 2018

Sr. No.	Roll. No.	Name of the Student	EM-III	%	CG	%	ADS	%	MP	%	PPL	%	DEL	%	CGL	%	ADSL	%	ML	%	Total Hrs	%
		Total Lect. Conducted	45		44		42		40		37		11		24		12		11		266	
1	1722019	Pawar Snehal Laxman	40	88.9	37	84.1	36	85.7	38	95.0	32	86.5	10	90.9	17	70.8	9	75.0	10	90.9	229	86.1
2	1722020	Pawar Trupti Vikas	40	88.9	36	81.8	31	73.8	38	95.0	33	89.2	9	81.8	18	75.0	8	66.7	9	81.8	222	83.5
3	1722021	Pawar Vaishali Sanjay	41	91.1	38	86.4	35	83.3	36	90.0	36	97.3	11	100.0	14	58.3	6	50.0	11	100.0	228	85.7
4	1722022	Phadnis Swapnali Sudhir	29	64.4	28	63.6	29	69.0	31	77.5	32	86.5	9	81.8	19	79.2	7	58.3	9	81.8	193	72.6
5	1722023	Phase Vishakha Audumbar	33	73.3	31	70.5	34	81.0	36	90.0	34	91.9	10	90.9	20	87.0	11	100.0	11	100.0	220	83.3
6	1722024	Roman Snehal Ravindra	40	88.9	35	79.5	37	88.1	37	92.5	35	94.6	8	72.7	18	78.3	8	72.7	8	72.7	226	85.6
7	1722025	Salekar Rupali Balu	41	91.1	39	88.6	39	92.9	34	85.0	32	86.5	9	81.8	16	69.6	9	81.8	9	81.8	228	86.4
8	1722026	Salunke Pragati Sampat	33	73.3	33	75.0	37	88.1	38	95.0	32	86.5	8	72.7	14	60.9	6	54.5	6	54.5	207	78.4
9	1722027	Sathe Sunny Somnath	39	86.7	36	81.8	36	85.7	36	90.0	31	83.8	11	100.0	17	73.9	9	81.8	9	81.8	224	84.8
10	1722028	Shaikh Tamanna Anwar	41	91.1	36	81.8	36	85.7	38	95.0	34	91.9	11	100.0	20	87.0	11	100.0	11	100.0	238	90.2
11	1722029	Shinde Tejaswini Popat	41	91.1	37	84.1	37	88.1	36	90.0	33	89.2	10	90.9	20	87.0	11	100.0	11	100.0	236	89.4
12	1722030	Shivankar Ankita Vinayak	39	86.7	36	81.8	36	85.7	36	90.0	31	83.8	11	100.0	17	73.9	9	81.8	9	81.8	224	84.8
3	1722031	Surve Ashlesha Devidas	39	86.7	34	77.3	34	81.0	33	82.5	31	83.8	10	90.9	20	87.0	10	90.9	10	90.9	221	83.7
4	1722032	Surve Omkar Shashank	41	91.1	37	84.1	37	88.1	36	90.0	33	89.2	10	90.9	20	87.0	11	100.0	11	100.0	236	89.4
5	1722033	Thakare Priyanka Shashikant	26	57.8	28	63.6	31	73.8	28	70.0	26	70.3	10	90.9	22	95.7	12	109.1	12	109.1	195	73.9
5	1722034	Yadav Krishna Ramdhani	33	73.3	31	70.5	34	81.0	36	90.0	34	91.9	10	90.9	20	87.0	11	100.0	11	100.0	220	83.3
	1722035	Yadav Prajwal Shankar	41	91.1	36	81.8	36	85.7	38	95.0	34	91.9	11	100.0	20	87.0	11	100.0	11	100.0	238	90.2
	1722036	Yadav Tanuja Dnyaneshwar	39	86.7	33	75.0	32	76.2	35	87.5	32	86.5	11	100.0	23	100.0	11	100.0	11	100.0	227	86.0

Prof. A. S. Sondkar
Class Teacher

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AMC Coordinator

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Prof. M. B. Wagh
HOD

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Department of Computer Engineering

Semester-II Academic Year-2017-18

Prelim Examination Class: S.E.

Result Analysis

Roll No.	Name of Student	EM-III	CG	ADS	MP	PPL	No of fail subjects	No.of Absent
1722019	Pawar Snehal Laxman	23	27	36	27	32	0	0
1722020	Pawar Trupti Vikas	20	**17**	35	21	**16**	2	0
1722021	Pawar Vaishali Sanjay	30	**19**	**19**	**AB**	30	0	1
1722022	Phadnis Swapnali Sudhir	24	33	**10**	33	28	1	0
1722023	Phase Vishakha Audumbar	34	39	38	25	**14**	1	0
1722024	Roman Snehal Ravindra	**4**	**7**	28	22	**4**	3	0
1722025	Salekar Rupali Balu	**AB**	AB	AB	**AB**	AB	0	5
1722026	Salunke Pragati Sampat	20	**7**	22	20	27	1	0
1722027	Sathe Sunny Somnath	30	21	25	34	26	0	0
1722028	Shaikh Tamanna Anwar	**14**	**7**	34	**14**	31	3	0
1722029	Shinde Tejaswini Popat	20	21	**15**	**AB**	**8**	2	1
1722030	Shivankar Ankita Vinayak	**19**	**17**	**18**	**AB**	33	2	1
1722031	Surve Ashlesha Devidas	25	26	28	29	20	0	0
1722032	Surve Omkar Shashank	37	22	22	**AB**	26	0	1
1722033	Thakare Priyanka Shashikant	34	25	42	24	31	0	0
1722034	Yadav Krishna Ramdhani	36	39	40	33	39	0	0
1722035	Yadav Prajwal Shankar	**12**	**11**	**16**	**AB**	AB	3	2
1722036	Yadav Tanuja Dnyaneshwar	34	22	32	35	40	0	0

Total No. of Students :	36	36	36	36	36
Total No. of Students Present :	17	17	17	12	16
Total No. of Students ABent :	1	1	0	6	2
Total No. of Students Passed :	13	10	12	11	12
Total No. of Students Failed :	4	7	5	1	4
Result in Percentage	76.47	58.82	70.58823529	91.67	75.00
Staff Initials	YGJ	MBW	ASS	SMJ	SAB
Sign of Subject Teacher :					

Rajiv Gandhi Dnyanpeeth's College of Engg.
DTE: 6324
SPPU: 4071
Dhangawadi
Pune
412205
Shri Chhatrapati Shivajiraje

11. NPTEL ADVANCED COURSES THOUGH NPTEL CHAPTER

Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engineering
Approved by AICTE, New Delhi, Recognized by Govt. of Maharashtra and Affiliated to Savitribai Phule Pune University, Pune (ID. PU/PN/Engg./376/2009), DTE CODE: EN3624
Since - 1972

Anantrao Thopte — Founder President, Ex. Edu. Minister
Sangram Thopte — MLA, Executive President
Dr. Bhagyashri Patil — Hon. Secretary
Dr. S. B. Patil — Principal

Date: 1st August 2018

OFFICE ORDER

Following staff members have been assigned additional institute level responsibilities from the academic year 2018-19 until further order.

The institute NPTEL Chapter comprises of the following members has to perform their related duties.

Sr. No.	Name of the Staff Member	Designation	Position
1	Prof. K. R. Suryawanshi	SPOC, NPTEL	Chairman
2	Prof. S. V. Bankar	Asst. SPOC, NPTEL	Member Secretary
3	Prof. S. I. Nipanikar	Coordinator E&TC	Member
4	Prof. S. P. Salunkhe	Coordinator Civil	Member
5	Prof. S. D. Thorbole	Coordinator Mechanical	Member
6	Prof. K. R. Pathak	Coordinator Computer	Member
7	Prof. Y. G. Jadhav	Coordinator FE	Member

All above members are requested to cooperate in this regards.

Rajgad Dnyanpeeth's Shri Chhatrapati Shivajiraje College of Engg. DTE:6324 SPPU:4071 Dhangawadi Pune 412206

Prof. Dr. S. B. Patil
Principal
Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engg.,
Dhangawadi, Pune-412206

NATIONAL PROGRAMME ON TECHNOLOGY ENHANCED LEARNING

A joint venture by Indian Institutes of Technology & Indian Institute of Science

NPTEL

2018-12-27

To
The Principal
RAJGAD DNYANPEETH'S SHRI CHHATRAPATI SHIVAJIRAJE COLLGE OF ENGINEERING GATE NO. 237, PUNE ANGALORE HIGHWAY, DHANGWADI, TAL. BHOR
PUNE - 412206
MAHARASHTRA

Dear Sir/Madam,

Sub: Establishing SWAYAM NPTEL Local Chapter in your college

Greetings from the NPTEL office.

This is to acknowledge the receipt of your letter accepting to host SWAYAM NPTEL Local Chapter in your institution.

The **Single Point of Contact (SPOC)** nominated from your college is

Name of SPOC: K. R. SURYAWANSHI
Designation: ASSISTANT PROFESSOR
Department:CIVIL ENGINEERING
Contact No(s):9511245719
E-mail id: rdtcnptel@rajgad.edu.in

We wish to inform you that all future correspondence related to NPTEL contents and online courses will be made to the afore-mentioned SPOC. He/she will be routinely updated with all the latest NPTEL initiatives which then may be circulated among the students.

We are also happy to share that a dedicated SWAYAM NPTEL Local Chapter web page is being created and your institution will have a separate page on it (http://nptel.ac.in/LocalChapter).

Thanking you.

Sincerely

Prof. R. K. Shevgaonkar
Principal Investigator
IIT BOMBAY

Rajgad Dnyanpeeth's Shri Chhatrapati Shivajiraje College of Engg.
DTE:6324
SPPU:4071
Dhangawadi
Pune
412206

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

List of SWAYAM NPTEL Exam Certificates

Sr. No.	Name of Student	Name of Course	Year	Branch
1	KIRAN RAMBHAU SURYAWANSHI	Electronic Waste Management - Issues and Challenges	2018	Civil Engineering
2	GORAKHANATH SADASHIV JADHAV	Wastewater Treatment and Recycling	2018	Civil Engineering
3	DIPAK POPAT JAVALE	Wastewater Treatment and Recycling	2018	Civil Engineering
4	DIPTI CHANDRAKANT JAGTAP	Wastewater Treatment and Recycling	2018	Civil Engineering
5	GORAKHANATH SADASHIV JADHAV	Introduction to Operations Research	2018	Civil Engineering
6	DIPTI CHANDRAKANT JAGTAP	Introduction to Operations Research	2018	Civil Engineering
7	NAGRAJ HIREMATH	Robotics	2018	Mechanical Engineering
8	GORAKHANATH SADASHIV JADHAV	Engineering Mechanics - Statics and Dynamics	2019	Civil Engineering
9	KIRAN RAMBHAU SURYAWANSHI	Effective Engineering Teaching In Practice	2019	Civil Engineering
10	SHITAL PRAKASH SALUNKHE	Engineering Mechanics - Statics and Dynamics	2019	Civil Engineering
11	DIPTI CHANDRAKANT JAGTAP	Soft Skills For Business Negotiations And Marketing Strategies	2019	Civil Engineering
12	PAWAR MATHAN KUMAR	Engineering Mechanics - Statics and Dynamics	2019	E&TC

Rajgad Dnyanpeeth's Shri Chhatrapati Shivajiraje College of Engg. DTE:632 SPPU:4071 Dhangawadi Pune 412206

K. R. Suryawanshi
SPOC, NPTEL Local Chapter

Roll No: NPTEL19MG11S31970031

To
DIPTI CHANDRAKANT JAGTAP
KEDARESHWAR-TARANGAN RESIDENCY, ASHLESHA BUILDING, FLAT NO 3
SHIRWAL
SATARA
MAHARASHTRA
412801
PH. NO :9922878491

Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully completed the course
<40	No Certificate

No. of credits recommended by NPTEL:3

Elite

NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)

This certificate is awarded to

DIPTI CHANDRAKANT JAGTAP

for successfully completing the course

Soft Skills For Business Negotiations And Marketing Strategies

with a consolidated score of **70** %

Online Assignments	17.78/25	Proctored Exam	52.5/75

Total number of candidates certified in this course: **1340**

A. Goswami

Prof. Adrijit Goswami
Dean, Continuing Education & NPTEL Coordinator
IIT Kharagpur

Jan-Apr 2019
(12 week course)

Indian Institute of Technology Kharagpur

FREE ONLINE EDUCATION swayam शिक्षित भारत, उन्नत भारत

Roll No: NPTEL19ME01S11740685

To
PAWAR MATHAN KUMAR
AT.POST-SUPA TAL- PARNER DIST-
AHAMDNAGER STATE - MAHARASHTRA
SUPA
AHMEDNAGAR
MAHARASHTRA
412205
PH. NO :9822583871

Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully completed the course
<40	No Certificate

No. of credits recommended by NPTEL:2

NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)

This certificate is awarded to

PAWAR MATHAN KUMAR

for successfully completing the course

Engineering Mechanics - Statics and Dynamics

with a consolidated score of **41** %

Online Assignments	17.29/25	Proctored Exam	24/75

Total number of candidates certified in this course: **343**

Prof. A. Ramesh
Chairman
Centre for Continuing Education, IITM

Jan-Mar 2019
(8 week course)

Prof. Andrew Thangaraj
NPTEL Coordinator
IIT Madras

Indian Institute of Technology Madras

FREE ONLINE EDUCATION swayam शिक्षित भारत, उन्नत भारत

Roll No:NPTEL18CE26S21860576

To

DIPTI CHANDRAKANT JAGTAP
FLAT NO.3 ,ASHLESHA BUILDING,
KEDARESHWAR TARANGAN RESIDENCY, PALSHI
RAOD
SHIRWAL
SATARA
MAHARASHTRA
412801
PH. NO :9922878491

Score	Type of Certificate
>=90	Elite + Gold Medal
60-89	Elite
40-59	Successfully Completed the course
<40	No Certificate

No. of credits recommended by NPTEL:3

NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)

This certificate is awarded to

DIPTI CHANDRAKANT JAGTAP

for successfully completing the course

Wastewater Treatment and Recycling

with a consolidated score of **52** %

Online Assignments	12.91/25	Proctored Exam	39/75

Prof. Anupam Basu
NPTEL Coordinator
IIT Kharagpur

Total number of candidates certified in this course: **592**

Jul-Oct 2018
(12 week course)

A. Goswami

Prof. Adrijit Goswami
Dean
Continuing Education, IIT Kharagpur

Indian Institute of Technology Kharagpur

FREE ONLINE EDUCATION swayam शिक्षित भारत, उन्नत भारत

Roll No:NPTEL18MG41S11710354

To

DIPTI CHANDRAKANT JAGTAP
FLAT NO.3 ,ASHLESHA BUILDING,
KEDARESHWAR TARANGAN RESIDENCY, PALSHI
RAOD
SHIRWAL
SATARA
MAHARASHTRA
412801
PH. NO :9922878491

Score	Type of Certificate
>=90	Elite + Gold Medal
60-89	Elite
40-59	Successfully Completed the course
<40	No Certificate

No. of credits recommended by NPTEL:2

NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)

This certificate is awarded to

DIPTI CHANDRAKANT JAGTAP

for successfully completing the course

Introduction to Operations Research

with a consolidated score of **41** %

Online Assignments	17.25/25	Proctored Exam	23.25/75

Total number of candidates certified in this course: **357**

Prof. A. Ramesh
Chairman
Center for Continuing Education, IITM

Aug-Sep 2018
(8 week course)

Prof. Andrew Thangaraj
NPTEL Coordinator
IIT Madras

Indian Institute of Technology Madras

FREE ONLINE EDUCATION swayam शिक्षित भारत, उन्नत भारत

Roll No:NPTEL18CE26S21860674

To

DIPAK POPAT JAVALE
101 HINGANGAON
HINGANGAON
PUNE
MAHARASHTRA
413106
PH. NO :9975617747

Score	Type of Certificate
>=90	Elite + Gold Medal
60-89	Elite
40-59	Successfully Completed the course
<40	No Certificate

No. of credits recommended by NPTEL:3

NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)

This certificate is awarded to

DIPAK POPAT JAVALE

for successfully completing the course

Wastewater Treatment and Recycling

with a consolidated score of **50** %

Online Assignments	13.94/25	Proctored Exam	36/75

Total number of candidates certified in this course: **592**

Prof. Anupam Basu
NPTEL Coordinator
IIT Kharagpur

Jul-Oct 2018
(12 week course)

A. Goswami

Prof. Adrijit Goswami
Dean
Continuing Education, IIT Kharagpur

Indian Institute of Technology Kharagpur

FREE ONLINE EDUCATION swayam शिक्षित भारत, उन्नत भारत

Roll No:NPTEL18ME61S11710641

To

NAGRAJ HIREMATH
A/P- NAVE PARGAON, TAL- HATKANANGLE,
DIST-KOLHAPUR
PARGAON
KOLHAPUR
MAHARASHTRA
416113
PH. NO :7798695963

Score	Type of Certificate
>=90	Elite + Gold Medal
60-89	Elite
40-59	Successfully Completed the course
<40	No Certificate

No. of credits recommended by NPTEL:2

Elite

NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)

This certificate is awarded to

NAGRAJ HIREMATH

for successfully completing the course

Robotics

with a consolidated score of **66** %

Online Assignments	22.92/25	Proctored Exam	43.5/75

Total number of candidates certified in this course: **1069**

Prof. Anupam Basu
NPTEL Coordinator
IIT Kharagpur

Aug-Sep 2018
(8 week course)

A. Goswami

Prof. Adrijit Goswami
Dean
Continuing Education, IIT Kharagpur

Indian Institute of Technology Kharagpur

FREE ONLINE EDUCATION swayam शिक्षित भारत, उन्नत भारत

12. NPTEL VIDEOS AVAILABILITY FOR ALL SUBJECTS

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune

(Maharashtra)

Engineering Mathematics-III (SE Comp)

Link for video lectures

nit lo.	Name of unit	Video lecture link
1	**Linear Differential Equation with constant coefficient.**	
	1.Finding complementary function 2.Finding particular Integral 3.Equations reducible to LDE	https://onlinecourses.nptel.ac.in/noc19_ma12/unit?unit=6&lesson=9 https://onlinecourses.nptel.ac.in/noc19_ma12/unit?unit=13&lesson=14 https://onlinecourses.nptel.ac.in/noc19_ma12/unit?unit=13&lesson=17
2	**Fourier and Z-Transform**	
	1. Fourier Transform **2.**Z transform and inverse Z transform of some elementary functions **3.** Properties of Z transform	https://onlinecourses.nptel.ac.in/noc19_ma12/unit?unit=76&lesson=81 https://onlinecourses.nptel.ac.in/noc19_ma12/unit?unit=55&lesson=59 https://onlinecourses.nptel.ac.in/noc19_ma12/unit?unit=55&lesson=60
3	**Statistics**	
	1.Correlation 2.Moments	https://nptel.ac.in/courses/111105041/20 https://nptel.ac.in/courses/111105041/11 https://ocw.mit.edu/courses/mathematics/18-650-statistics-for-applications-fall-2016/lecture-videos/lecture-1-introduction-to-statistics/
4	**Probability**	
	1.Simple Probability 2.Probability distributions 3.Test of hypothesis	https://nptel.ac.in/courses/111105041/3 https://nptel.ac.in/courses/111105041/8 https://nptel.ac.in/courses/111105041/35 https://www.youtube.com/watch?v=r1sLCDA-kNY
	Vector Calculus	
	Vector differentiation and Vector integration	https://nptel.ac.in/courses/111107108/29 **to** https://nptel.ac.in/courses/111107108/39
	Complex Integration	
	CR equation Residue theorem	https://nptel.ac.in/courses/111103070/10 **to** https://nptel.ac.in/courses/111103070/39

Subject Teacher

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department of Computer Engineering

Links for NPTEL Video Lecture

Subject: Data Structure and Algorithm(2015 pat.) **Class : S.E Comp**

Sr No.	Topic List	Video Lecture Link
1	Introduction to Data Structures and Algorithms	https://nptel.ac.in/courses/106102064/1 https://www.youtube.com/watch?v=zWg7U0OEAoE&list=PLBF3763AF2E1C572F & index=1
2	Introduction to asymptotic notations	https://www.youtube.com/watch?v=aGjL7YXI31Q&list=PLEbnTDJUr_IeHYw_sf BOJ6gk5pie0yP-0
3	Time complexity Analysis of iterative programs	https://www.youtube.com/watch?v=FEnwM- iDb2g&index=2&list=PLEbnTDJUr_IeHYw_sfBOJ6gk5pie0yP-0
4	Insertion sort algorithm and analysis	https://www.youtube.com/watch?v=BO145HIUHRg&list=PLEbnTDJUr_I eHYw_sfBOJ6gk5pie0yP-0&index=7
5	Introduction to heaps	https://www.youtube.com/watch?v=40iljMQmqmY&list=PLEbnTDJUr_IeHYw_ sfBOJ6gk5pie0yP-0&index=11
6	Stacks	https://nptel.ac.in/courses/106102064/2 https://www.youtube.com/watch?v=g1USSZVWDsY&index=2&list=PLBF3763AF2E1C572F
7	Queues and Linked Lists	https://nptel.ac.in/courses/106102064/3 https://www.youtube.com/watch?v=PGWZUgzDMYI&list=PLBF3763AF2E1C572F&index=3
8	Dictionaries	https://nptel.ac.in/courses/106102064/4 https://www.youtube.com/watch?v=BmayUdDaDYM&list=PLBF3763AF2E1C572F&index=4
9	Hashing	https://nptel.ac.in/courses/106102064/5 https://www.youtube.com/watch?v=KW0UvOW0XIo&index=5&list=PLBF3763AF2E1C572F

10	Trees	https://nptel.ac.in/courses/106102064/6 https://www.youtube.com/watch?v=tORLeHHtazM&list=PLBF3763AF2E1C572F&index=6
11	Tree Walks and Traversals	https://nptel.ac.in/courses/106102064/7 https://www.youtube.com/watch?v=eWeqqVpgNPg&index=7&list=PLBF3763AF2E1C572F
12	Ordered Dictionaries	https://nptel.ac.in/courses/106102064/8 https://www.youtube.com/watch?v=bvOYfDpk940&index=8&list=PLBF3763AF2E1C572F
13	AVL Trees	https://nptel.ac.in/courses/106102064/11 https://www.youtube.com/watch?v=mRGQylRWAsI&list=PLBF3763AF2E1C572F&index=11
14	Red Black tree	https://nptel.ac.in/courses/106102064/14 https://www.youtube.com/watch?v=JRsN4Oz36QU&list=PLBF3763AF2E1C572F&index=14
15	Tries	https://www.youtube.com/watch?v=uhAUk63tLRM&index=18&list=PLBF3763AF2E1C572F
16	Priority Queue	https://www.youtube.com/watch?v=P4toxusBX9M&index=20&list=PLBF3763AF2E1C572F
17	Graphs	https://www.youtube.com/watch?v=9zpSs845wf8&index=24&list=PLBF3763AF2E1C572F
18	Prims and Kruskals Algorithm	https://www.youtube.com/watch?v=7FtGk9yr66A&index=33&list=PLBF3763AF2E1C572F
19	Dijkstras Algorithm	https://www.youtube.com/watch?v=NR0qG64gZUs&list=PLBF3763AF2E1C572F&index=35
20	Quick Sort	https://www.youtube.com/watch?v=gtWw_8VvHjk&index=10&list=PLBF3763AF2E1C572F

Subject Teacher

Prof. A.S.Sondkar

13.TECHNICAL PAPER PRESENTATION IN NATIONAL INTERNATIONAL LEVEL CONFERENCE

Rajgad Dnyanpeeth's

Shri Chhatrapati Shivajiraje College of Engineering

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Paper Publication Details By Students

Academic year : 2017-18

Summary

Sr. No.	Year of publication	Title of Paper	Name of the author/s	Name of journal	ISBN/ISSN number
1	2017-18	Air Pollution Controller -Fabric Filter	1. Dipti C. Jagtap	International Research Journal of Engineering and Technology(IRJET)	ISSN:2395-0056
2	2017-18	Review on Free Piston Engine	1. Kadam Hemant V. 2. Sayambar Ashvini B.	International Journal of Engineering Research in Mechanical and Civil Engineering (IJERMCE)	ISSN: 2456-1290
3	2017-18	Review on Advance Towed Artillery Gun System	1. Kadam Hemant V. 2. Khakal Suvarna D.	International Journal of Engineering Research in Mechanical and Civil Engineering (IJERMCE)	ISSN: 2456-1290
4	2017-18	Performance of Microbial Fuel Cell with Clayware Wall Separation Subjected to Variation in Area of Separation, Permeability, Temperature	1. R. Fulari 2. M. Wagh 3. R. J. Raut	International Journal of Science,Engineering and Managemnet (IJSEM)	ISSN (Online): 2456 -1304
5	2017-18	Implemenatation of Agile Methodologies in software Engineering and project Management	1.Bathe Pooja P. 2.Malusare Sonali A. 3.Kolape Monali D.	Journal of Information, Knowledge and Research in Computer Engineering.	ISSN:0975-6760 NOV 16 TO OCT 17 Volume 4,Issue 2
6	2017-18	Airborne Internet	1.M.P.Shalinmath Nasli 2.Ketki Datta G. 3.Dubbal Gazala	Journal of Information, Knowledge and Research in Computer Engineering.	ISSN:0975-6760 NOV 16 TO OCT 17 Volume 4,Issue 2
7	2017-18	Experimental investigation of performance and emission testing of sea mango seeds oil biodiesel	1.N. S. Shinde 2.V. S. Ahire 3. A. D. Shinde 4. K. A. Karande	International Journal of Engineering Research in Mechanical and Civil Engineering (IJERMCE)	ISSN: 978-81-932966-8-4
8	2017-18	Survey on Automated Billing System in Plaza using Zigbee	1.Mohite S.M 2.Shelke P.B 3.Rajapure S.A 4.Bhosale P.N	Journal of Information, Knowledge and Research in Computer Engineering.	ISSN:0975-6760 NOV 16 TO OCT 17 Volume 4,Issue 1
9	2017-18	Online Chatting system for College Inquiry Using Knowledge Database	1.Bathe Pooja P. 2.Malusure S.A 3.Kolape M.D	International Journal of Engineering Research in Electronics and Communication Engineering(IJERECE)	ISSN(Online): 2397-6849 Volume 5,Issue 4, April 2018
10	2017-18	Improved Zone routing protocol for MANET	1.Roman Pranita 2.Khatpe Akshay 3.Theurkar Supriya	International Journal of Science,Engineering and Managemnet (IJSEM)	ISSN(Online): 2456-1304 Volume 3,Issue 4, April 2018

11	2017-18	Cyber Bullying Detection and Prevention for social Media using Data Mining	1.Chaitali R.Kamthe 2.Awade Milind S. 3.Kadam Aishwarya M.	International Journal of Science,Engineering and Managemnet (IJSEM)	ISSN(Online): 2456-1304 Volume 3,Issue 4, April 2018
12	2017-18	Smart Meditation Box for Memory Disorder Patients	1.Nikhil Dhumal 2.Dhamal Rakshanda 3.Malusare Pooja 4.Shivthare Prajakta	International Journal of Science, Engineerin and Managemnet (IJSEM)	ISSN(Online): 2456-1304 Volume 3,Issue 4, April 2018
13	2017-18	Testing Machine of Metal CAN Coating by using ARM7 Processor	1.Sonali Nigade 2.Deepak Bade	International Journal of Science, Engineerin and Managemnet (IJSEM)	ISSN(Online): 2456-1304 Volume 3,Issue 4, April 2018
14	2017-18	Design of Low Cost Human Body Parameter Measuring Devices	1.AnkitA Patane 2.Poonam Mahangare 3.Akshay Tanpure 4.Yogesh Yadav	International Journal of Science, Engineerin and Managemnet (IJSEM)	ISSN(Online): 2456-1304 Volume 3,Issue 4, April 2018
15	2017-18	A Smart Industry Based Environment Monitoring and Controlling	1.Kranti Kadam 2.Annu Landage 3.Usha Pilane	International Journal of Science, Engineerin and Managemnet (IJSEM)	ISSN(Online): 2456-1304 Volume 3,Issue 4, April 2018

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International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 4, April 2018

Cyber bullying Detection & Prevention for Social Media Using Data Mining

[1] Nangare Ravi B., [2] Chaitali R. Kamthe, [3] Awade Milind Shravan, [4] Kadam Aishwarya Mahesh
[1] Assistant Professor RDTC SCSCOE, Dhangawadi, Pune, [2], [3], [4] RDTC- SCSCOE, Dhangwadi

Abstract- **The increasing use of social communication networks by their users leads to huge amount of user-generated communication data. Due to the popularity of social media cyberbullying become the major problem in online communication and cyberbullying behavior received more and more attention. Cyberbullying may cause many serious and negative impacts on person's life and even leads to teen suicide. In the existing system the set of unique features derived from Twitter such as network, activity, user and tweet contents. By using these features the cyberbullying words which are presented in the comment contents are detected using data mining algorithms. The rumor comments are detected using syntactic and semantic techniques. The cyberbully detection and rumor detection on social network are done separately in the existing technique. In the proposed work the detection of cyberbully words and rumor comments on social media are integrated into a single application, along with these the cyberbully contents in the post. Comments will be detected using Pattern Matching algorithm.**

Keywords— Cyber bullying, social-network, Cyber harassment, Text mining.

I. INTRODUCTION

Cyberbullying was defined by Patching and Hinduja as "willful and repeated harm inflicted through the medium of electronic text .According to the definition of the National Crime Prevention Council ,cyberbullying is the use of the Internet, cell phones or other technologies to send or post a text or images intended to hurt or embarrass another person . Flooding It is consists of the bully frequently sending the same comment, nonsense comments, or press the enter key in order to not allow the victim to contribute to the conversation. Masquerade involves the bully pretends to be someone who they are not. This would make it appear with the purpose of bully a victim directly. Flaming or bashing is a kind of online fight. The bully sending or posting electronics message which are enticingly insulting, vulgar to one or several persons either privately or publicly to an online group. Harassment is the kind of conversation that the bully frequently sends insulting and rude messages to the victim. Cyber stalking and cyber threats occur when the poster sends intimidating or offensive messages. Denigration also called "dissing" happens when an electronic bully sends or publishes gossip or untrue statement about a victim in order to damage the victim's friendship or reputation. Outing occurs when a person sends or publishes private or embarrassing information in a public chat room or forum. This type of cyberbullying is similar to the denigration. However in outing the relationship between bully and victim are close.

II. LITERATURE SURVEY

a) Detection of cyberbullying in messages Yin et al., conducted experiments on three different data sets (My Space, Slashdot and Congregate) provided by Content analysis for Web 2.0 (CAW 2.0 in order to detect harassment. For harassment detection they used content, sentiment, and contextual features of the documents to train a support vector machine (SVM) classifier for a corpus of online posts. Various methods were used to develop the attributes of the entrance to the classifier, such as: standard text mining techniques based on weights of term (in this case - words), rule-based systems for detection of feelings and context analysis. The obtained results demonstrated that the use of the combined model, which besides text mining included methods for adding context and detection of feelings ,improved the detection of cyberbullying.

B) Detection of cyberbullying on Twitter A framework for the detections of cyberbullying on Twitter was created by Sanchez and amp; Kumar. Text that was used in messages (tweets, twitter message) requires intensive pre-processing prior to classification, including identification of syntax errors, emotions, and use of slang. The idea was to classify emotions contained in a message using a
Sentiment analysis and opinion mining, and then to visualize the changes in the message over time. The messages were classified using Naive Bayes algorithm as negative or positive, with respect to some frequently used words. Bag-of- words model was used in the classification. The aim of the authors was to identify the victims.

C) Detection of cyberbullying in comments from YouTube video clips Dadvar et al. detected cyberbullying in comments from YouTube video. They used combination of content based, cyberbullying specific and user based features. They have shown that using user context (user's comments history and user characteristics) improves

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International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 4, April 2018

cyberbullying detection accuracy. For training they used SVM binary classifier.

D) Detection of cyberbullying in social networks Nahar et al. proposed semi-supervised approach for detection in social networks, by devised new framework automatic detection of cyberbullying for streaming data with insufficient labeling. They conducted experiments on three different data sets (My Space, Slashdot and Congregate) provided by Content analysis for the enriched features sets were generated based on user context, linguistic knowledge and baseline keywords. They proposed fuzzy SVM algorithm for cyberbullying detection.

III. PROPOSED ARCHITECTURE

In the proposed architecture the process of detecting cyberbully activities begins with input dataset from social network. Input is text conversation collected from social Q&A website. Input is given to data pre-processing which is applied to improve the quality of the research data and subsequent analytical steps, this includes removing stop words, extra characters and hyperlinks. After performing pre-processing on the input data, it is given to Feature Extraction. Feature Extraction is done to obtain features like Noun, Adjective and Pronoun from the text and statistics on occurrence of word (frequency) in the text. The extracted features are given to Learning Algorithm. The Learning algorithm unit is the central element of the architecture and is composed of a genetic algorithm for modeling adaptive and exploratory behavior. Knowledge is given as Fuzzy rule set. The main functionality is to adjust the representation of the information needed for classification and yet retains the essential knowledge from the past. This knowledge is kept in a population of chromosomes, which is processed by the genetic algorithm. All the chromosomes in the population are competing to predict the classification of cyberbully activities. The output from learning unit is given to Classifier technique classifies the cyberbully activities using the fitness value of chromosome. The ability of a chromosome to classify the activity is called the fitness of the chromosome. The chromosome with higher fitness value gives the classified output. The output is classified bullying words present in the conversation.

IV. MATHEMATICAL MODEL

This consists of the total mathematical model gives idea about the analysis of the proposed system in terms of mathematical notations.

S = {U, D, C, E, SA}
Where, S = System.
U = User login system.
D = Data Center.
U = {U1, U2, U3 .Un — Un ...}
D = {D1, D2, D3 .Dn — Dn ..}
C=Comment.
SA = Main System.
E= Eliminate.
SE = I, Q, T, F
SE = Server for operation.
I = Input (Data Comment.)
Q = Display Remove comment.
T=Task process.
When,
F= if negative comment then do not post
Else Post the comment
SA = Comment Uploading, Remove Comment, Identify Data Center, Task Assignment Task Processing
Success Conditions: As per user input desired output is generated
Failure Conditions: Desired output is not obtained

V. ALGORITHM

The Brute-Force Algorithm consists in comparing two strings of characters. This algorithm compares from left to right each word the user writes with each letter of the name of the file found inside of the route the user specifies. The process that this algorithm performs is the following [3]:

- Takes the character with which the pattern starts.
- Starts to compare it with each of the text characters, until the first match is found.
- It stops in said position and from there it starts to verify if the pattern matches with the rest of the text

```
Naive-String-Matcher (T,P)
 n = T.length  m= P.length
for s = 0 to n – m   if P[1..m] == T[s + 1..s + m]
 print "Pattern occurs with shift" s
```

VI. RESULTS

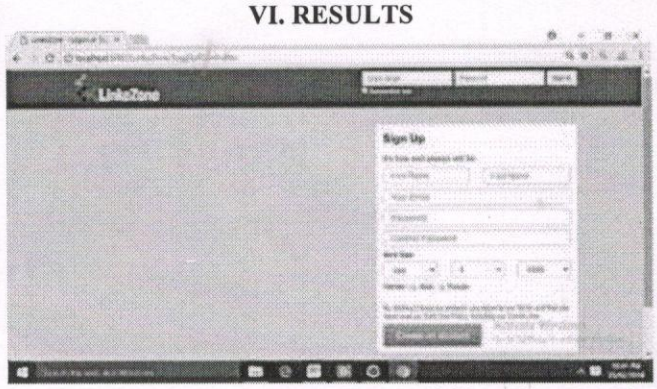

Fig1:-User Login by enter the email-id and password

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Vol 3, Issue 4, April 2018

Fig2:-Login User Profile

Fig3:-Comment entered on User Profile

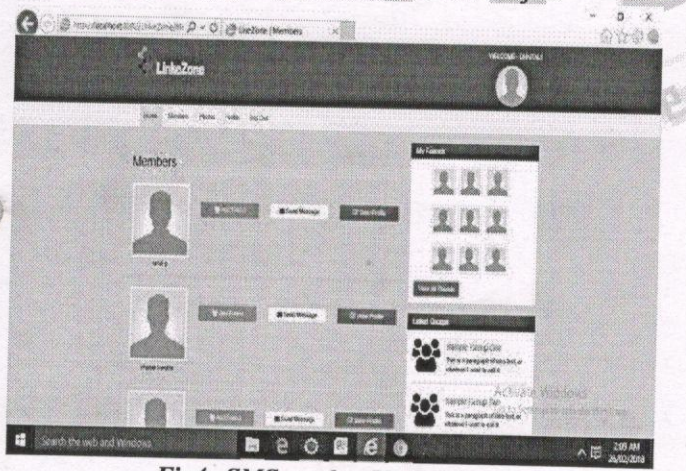

Fig4:-SMS send to User Friend

VII. CONCLUSION

In this paper we represented a survey on the current scenario of cyberbullying and various methods available for the detection and prevention of cyber harassment. Our concept depends upon the text analysis, the data which is uploaded or text written by any user is first analyzed and after that, we estimate the roles of user, is it a bully? Or a victim? And then provide help as required by the user using data mining techniques. Also we will be using a User Identity for registration on our site i.e. one will have to provide an identity proof for registering on our site else they will not be able to make an account. With this feature we will be able to check the problem of fake accounts and also cyberbullying will be controlled to a limit as user accounts will be directly linked to their original identity. This mechanism will be very helpful for our society and the victims.

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ISSN (Online) : 2456 - 1304

The Board of International Journal of Science, Engineering and Management (IJSEM)

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in recognition of the publication of the paper entitled

"Cyber bullying Detection & Prevention for Social Media Using Data Mining"

Published in ***IJSEM*** *Journal, Volume* 3, *Issue* 4, *April 2018*

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Published in ***IJSEM*** *Journal, Volume* 3, *Issue* 4, *April 2018*

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14. TECHNICAL QUIZ COMPETITION

Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engineering
S. No. 237, Dhangawadi, Tal- Bhor, Dist- Pune

……

NOTICE

Date :20/2/2019

All the students of S.E Computer are hereby informed that **Techical Quiz-Competition** is scheduled on 25th February 2019 from 10.am to 12.30 a.m in seminar Hall. All the questions are based on your subject from Unit 1 to Unit 4.

Schedule of Quiz is as below.

Date	Quiz Rounds	Time
25/2/2019	ROUND 1 – Compulsory Questions	10.00 a.m to 11.am
	ROUND 2 – Buzzer Round	11.am to 12. a.m
	ROUND 3– Programming	12.a.m to 12.30 a.m

Event Co.Ordinator
Prof.A.S.Sondkar

Shri Chhatrapati Shivajiraje College of Engineering Pune
Comp. Engg. Deptt.

HOD
Prof.M.B.Wagh

Rajgad Dnyanpeeth's

Shree Chhatrapati Shivajiraje College of Engineering

S. NO. 237,Dhangawadi , Tal- Bhor, Dist-Pune.

DEPARTMENT OF COMPUTER ENGINEERING

Date : 27th Feb.2019

A REPORT ON "TECHNICAL QUIZ COMPETITION"

SEMESTER:IV **CLASS:** S.E COMP

A department of Computer Engineering had organized "Technical Quiz Competition" for Second Year computer engineering students on 25th February 2019.Purpose of organizing this event was to encourage students for positive competitions and hopes to bring out the best in all its students. The program was organized in seminar hall. Rules regulations and evaluation scheme ofthe quiz were explained at the beginning. It was interesting three-round competition, including

1.Objective questions with options round,
2.Buzzer round and
3.Programming skill round.

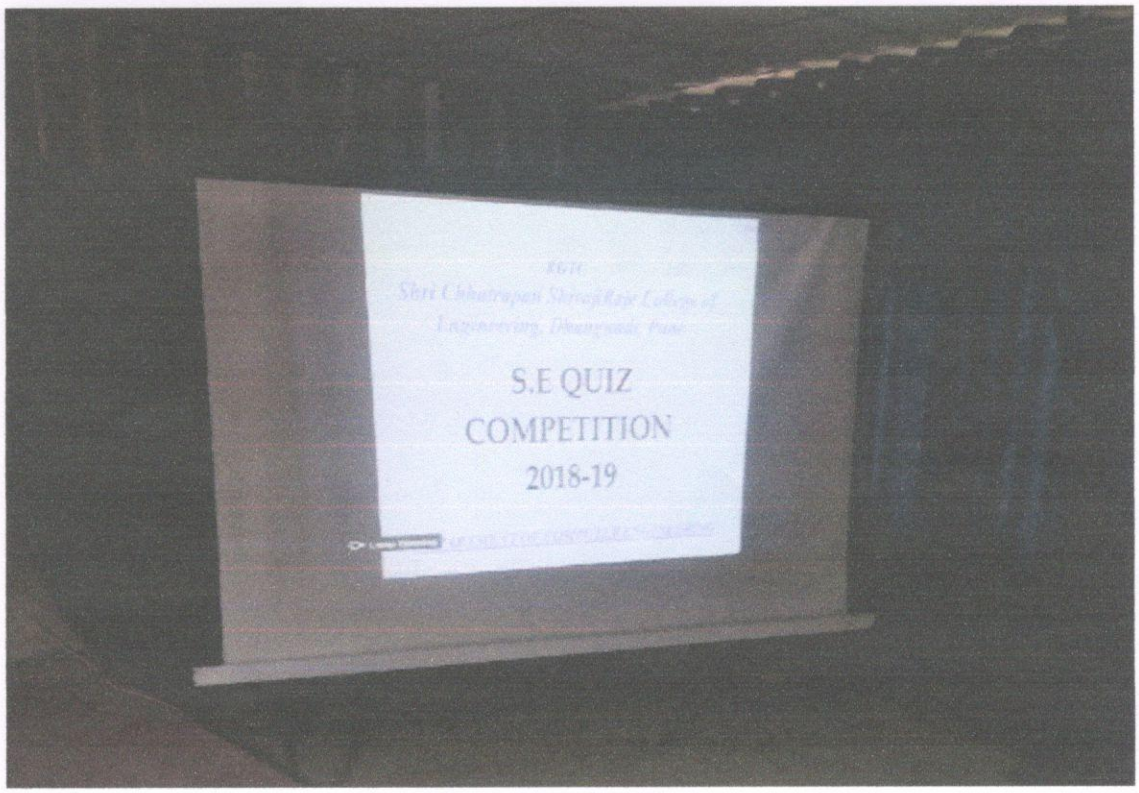
There were total five groups participated for quiz competition each comprising of four members.Question from all the subjects like Engineering Maths-III,Advanced Data Structure, Microprocessor and Principles of Programming Languages were asked in quiz competition.

In first round, for each question's correct answer 10 marks were given.No negative marking considered for round-I. If any group is unable to answer question same question was forwarded to immediate next group. Group 4 was eliminated from Round-I.

In second round ,groups were allowed to answer on first come first serve basis. Group answering question quickly secured marks for that question.For wrong answer -5 negative marking scheme was employed.Based on marks group 1 and group 3 were eliminated from round –II.

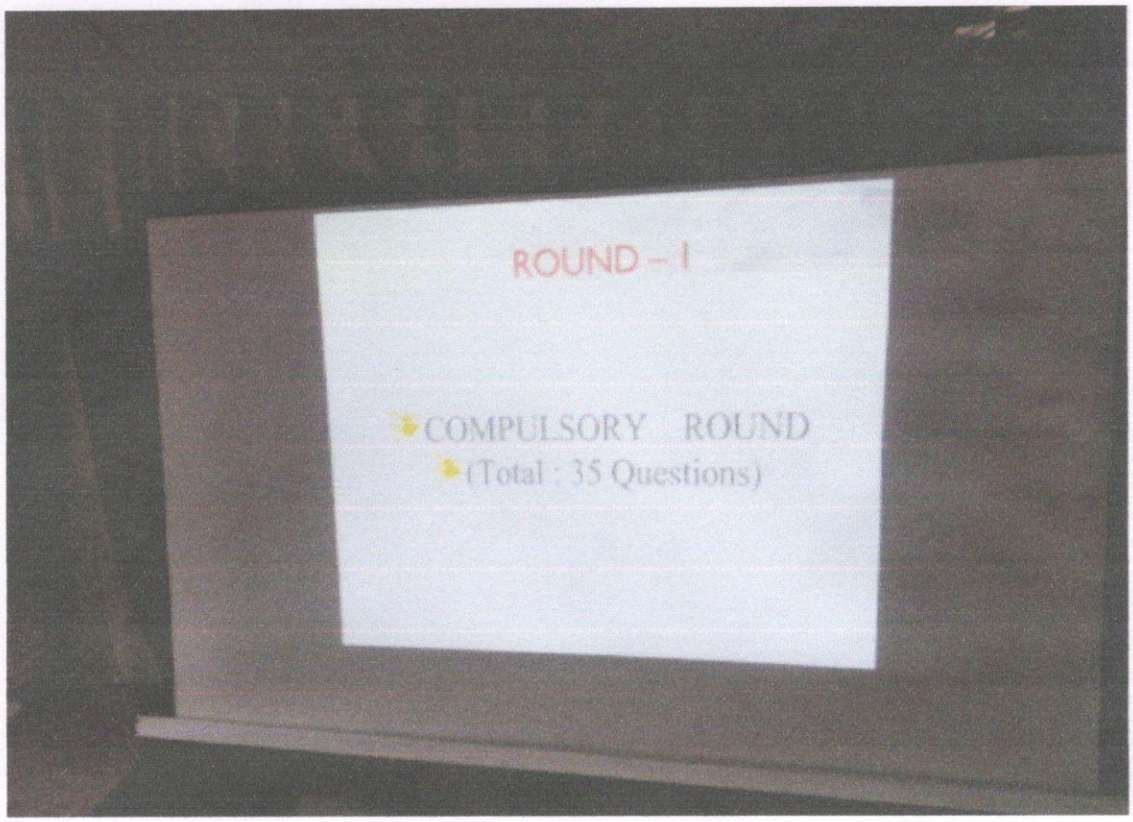
In round- III students were asked to write one programs from given options. Programs were analyzed based on logic, accuracy and correctness of the solution. All the students showcased their brilliance by rapidly answering the questionswith confidence.The group that scoredthe most in round-III was **Group 5**. Finally the program was ended with prize distribution.

Quiz Competition Snapshots:



Quiz PPT Opening

Shri Chhatrapati Shivajiraje College of Engineering Pune
Comp. Engg. Deptt.



ROUND-I Slide

Snapshot during question answer session

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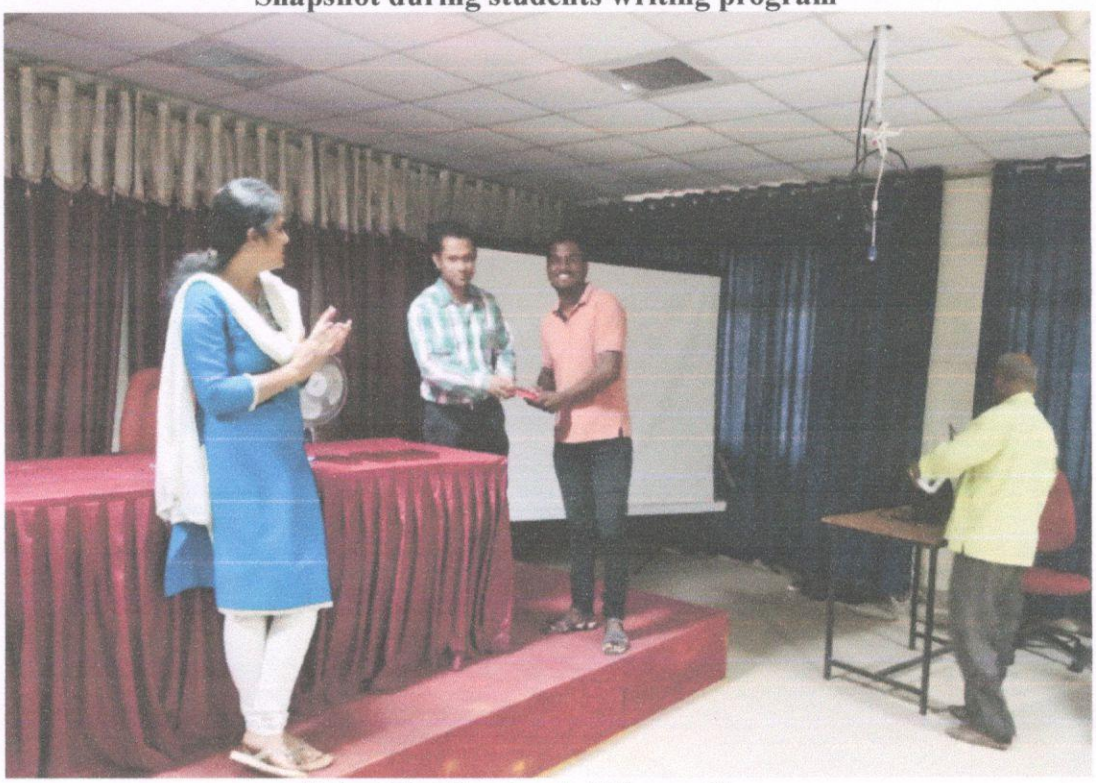
Comp. Engg. Deptt.

Snapshot during students writing program



Prize Distribution to Winner Group

Prize Distribution to Runner Up Group

Event Co.Ordinator

Prof.A.S.Sondkar

Shri Chhatrapati Shivajiraje College of Engineering,Pune
Comp. Engg. Deptt.

HOD

Prof.M.B.Wagh

PPTS

RDTC

Shri Chhatrapati ShivajiRaje College of Engineering, Dhangwadi, Pune

S.E QUIZ COMPETITION 2018-19

DEPARTMENT OF COMPUTER ENGINEERING

ROUND – I

COMPULSORY ROUND

(Total : 35 Questions)

Advanced Data Structure

Q.1 A hash function f defined as f (key) = key mod 13, with linear probin used to insert keys 55, 58, 68, 91, 27, 79. Table Size is 8 . What will be the lo of 79?

A. 1

B. 2

C. 3

D. 5

OPTION : B

ANSWER

Engineering mathematics-III

Q.24. Probability that a leap year selected at random will contain 53 Sunday is given by,

A) 1/7

B) 6/7

C) 3/7

D) 2/7

OPTION : D

ANSWER

Microprocessor

Q. 29 .The instruction that unconditionally transfers the cont of execution to the specified address is

A.CALL

B. JMP

C. RET

D IRET

Answer

Option: B

EXTRA

ADDITIONAL QUESTIONS

Total : 6

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Department of Computer Engineering

TECHNICAL QUIZ COMPETITION

S.E COMPUTER

SEMSTER : 2

DATE : 25/2/2019

YEAR : 2018-19

ROLL NO	NAME OF THE STUDENT	SIGN
1822001	SagarShilliesValiyaparambath	
1822002	Sakhu D Narhe	
1822003	PravinRandhirRasal	
1822004	IshitaSatyapriyaRajoriya	
1822005	Nikita SuryakantMaragaje	AB
1822006	PragatiBalasahebJagtap	
1822007	PriyankaHiralalBhosale	
1822008	Jyoti Prasad Sawant	
1822009	RutujaShekharKonde	
1822010	AshwiniShivajiJadhav	
1822011	JagrutiDagduShirke	
1822012	MadhuriPatil	
1822013	AishwaryaMahadevJadhav	AB
1822014	Shubham Vilas Bhujbal	AB
1822015	OnkarBhaskarPatskar	
1822016	AkshadaSharadAwade	
1822017	AkashMilind Mole	
1822018	SanjivaniChavan	
1822019	PratikshaSatish Lad	
1822020	Pratiksha Deepak Pawar	
1822021	NeelanjaliBapusahebChemate	
1822022	Vikrant Ashok Sarwade	
1822023	AniketNareshKank	

RajgadDnyanpeeth's

ShriChhatrapatiShivajiraje College of Engineering

S. No. 237, Dhangawadi, Tal- Bhor, Dist- Pune

1822024	PradnyaDattatrayJadhav	
1822025	Mayuri Ganesh Dhanawade	
ROLL NO	**NAME OF THE STUDENT**	**SIGN**
1822026	ShwetaMahendraJadhav	
1822027	Someshwar Ramesh Solat	
1822028	UjwalaKeshavDhapate	
1822029	TejashreeRamdasDeshmukh	
1822030	KirtiShripatiPawal	
1822031	Shagufta Khalid Ansari	
1822032	TruptiBajarangSonawane	
1822033	PratikshaChandrakant Pednekar	
1822034	NamrataTanajiKhatape	
1822035	AshwinikumarRajendra Baviskar	
1822036	PoojaSantoshKagade	
1822037	PratikshaVitthalSalunkhe	
1822038	ShwetaArjunPawar	
1822039	Nikhil RaghunathBorge	
1822040	SurajPrakashPatil	

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

ProgramCo.ordinator

Prof.A.S.Sondkar

RajgadDnyanpeeth's
ShriChhatrapatiShivajiraje College of Engineering
S. No. 237, Dhangawadi, Tal- Bhor, Dist- Pune

EVALUATION SHEET- ROUND 1 [COMPULSORY]

Group No.	Group Members	1	2	3	4	5	6	7	8	9	10	11	Total
1	Chavan Sanjivani	10	10	0	10	0	10						40
	Pawar Pratiksha												
	konde Rutuja												
	Neelanjali chemate												
2	kagade Pooja	10	0	10	10	10	0	10					50
	shirke Jagruti												
	Awade Akshada												
	Pawal kirti												
3	Jyoti Sawant	0	0	10	0	10	10	10					40
	Madhuri Patil												
	Pawar shweta												
	Salunkhe Pratiksha												
4	Lad Pratiksha	0	0	0	10	10	0	10					30
	Ansari shagufta												
	khatape Namrta												
	Rednekar Pratiksha												
5	Valyaparambth S. V.	0	0	10	10	10	10	10					50
	Rasal Pravin												
	Mole Akash												
	konk Aniket												

Group 4 is eliminated from Round-I.

Evaluator Name and Sign
Sondkar A.S.

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

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S. No. 237, Dhangawadi, Tal- Bhor, Dist- Pune

.....

EVALUATION SHEET- ROUND 2 [BUZZER ROUND]

Group No.	Group Members	1	2	3	4	5	6	7	8	9	10	11	Total
1	Chavan Sanjivani					-5	10	-5	-5	-5			-10
	Pawar Shweta												
	Konde Ratija												
	Nellargali Chemati												
2	Kagade Pooja	-5	10	10	-5								10
	Shirke Jagruti												
	Awade Akshada												
	Pawal Kirti												
3	Jyoti Sawant												
	Madhuri Patil	0	0	0	0								0
	Pawar Shweta												
	Salunkhe Patikha												
5	Vaityaparanath S.V.												
	Rasal Pravin	10	10	10	10	10.		10	-5	10	10	-5	70
	Mole Akash												
	Kank Aniket												

Group 1 & Group 3 are eliminated from Round-II.

Sudkar

Evaluator Name and Sign

Sudkar A-5

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ShriChhatrapatiShivajiraje College of Engineering
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[Programming Round]

EVALUATION SHEET- ROUND 3

Group No.	Group Members	Logic	Correctness /Errors	Efficiency	Total
2	kagade Pooja				
	shirke Jagruti	✓	Syntax	✓	5
	Awade Akshada				
	Pawal kirti				
5	Valiyaparambath S.V.				
	Raval Pravin	✓	✓	✓	10
	Mole Akash				
	kank Aniket				

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Evaluator Name and Sign
Sandkar A.S

Winner Group ⟹ Group 5.

|| प्रज्वलितो ज्ञानमयः प्रदिपः ||

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Approved by AICTE, Affliated to the University of Pune, Recognised by DTE (Govt. of Maharashtra)

Founder President : Anantrao Thopte MLA, Ex. Education Minister - Maharashtra

Exam Seat No. / Roll No. :- Group2

Center Code :- 4071

Exam Seat No. in Words :- Quiz- Competition - Sem-II 2018-19

Day / Date :- _____ Exam :- _____

Subject :- _____ Medium :- _____

Section :- _____ Sign. & Date of Invigilator :-

Main Answer Sheet + Supplement = 1 + [ ] = [ ]

Q. 1	Q. 2	Q. 3	Q. 4	Q. 5	Q. 6	Q. 7	Q. 8	Total
								05

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Comp. Engg. Deptt.

1) Pooja Kagade
2) Jagruti Shirke.
3) Pawal Kirti
4) Awade Akshada.

Q1 write a program to create to perform following operations on binary tree.
1. copy
2. Delete

```
Void delete (struct node *root)
{
    if (root)
    {
        delete (left -> data);
        delete (right -> data);
printf(" deleted elements are %d", &x);
```

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Founder President : Anantrao Thopte MLA, Ex. Education Minister - Maharashtra

Exam Seat No. / Roll No. :- Group 5	Center Code :- 4071

Exam Seat No. in Words :- Quiz Competition sem-II 2018-19

Day / Date :- _____ Exam :- _____

Subject :- _____ Medium :- _____

Section :- _____ Sign. & Date of Invigilator :-

Main Answer Sheet + Supplement = 1 + [ ] = [ ]

Q. 1	Q. 2	Q. 3	Q. 4	Q. 5	Q. 6	Q. 7	Q. 8	Total
								16

Shri Chhatrapati Shivajiraje College of Engineering Pune Comp. Engg. Dept

Group Membess :—

1) Pravin Rasal - 03
2) Sagar VP - 01
3) Aniket Kank. - 23
4) Akash Mole. - 17

Question :- Write a program to create to perform following operations on binary tree.

① Copy
② Delete.

→

```
#include <stdio.h>
#include <stdlib.h>
struct node * Create
```

15.ARRANGEMENT OF SEMINAR/WORKSHOP CONFERENCE

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

List of Seminar and Workshops Organized By Department

Department of Computer Engineering

Sr. No	Academic Year	Title of Seminar and Workshops Organized by Department	Date
1	2018-19	Seminar on " Current Treand in IT Industries"	19/01/2019 (01 Day)
2		Two Days Workshop on " Software Automation Testing"	31/08/2018 to 01/09/2018 (02 Days)
3	2017-18	Three Days State Level Workshop on "Web Development"	19/03/2018 to 21/03/2018 (03 Days)
4		One Day Seminar on "Intellectual Property Rights"	18/01/2018 (01 Day)
5		One Day Workshop on AMAZON AWS CLOUD	12/01/2018 (01 Day)
6		One Day Seminar on "Carrier Opportunities in Computer Engineering"	25/08/2017 (01 Day)
7		Workshop on" Programming Language-I (C and C++)	05/06/2018 to 10/06/2017 (06 Days)
8	2016-17	Workshop on "Microprocessor Laboratory"	19/03/2017 (01 Days)
9		One Day Workshop on "Industry Oriented Training and Development"	10/02/2017 (01 Days)
10		Two Days Workshop on "Research Methodology"	20/01/2017 to 21/01/2017 (02 Days)
11		One Day FDP on " High Impact Teaching Skills"	19/08/2016 (01 Days)
12	2015-16	Seminar on "Computer Graphics"	03/10/2015 (01 Day)
13		One Day Workshop on "QTP,SAP and Oracle"	12/09/2015 (01 Days)
14		One Day FDP on " Google App for Education"	20/08/2015 (01 Days)
15		One Week Workshop on "Carrier Growth and Opportunities in CCNA"	21/08/2015 to 26/08/2015 (07 Days)
16		Two Days FDP on " Network Simulator- II"	21/08/2015 to 22/08/2015 (02 Days)
17		Seminar on " Enlightening Students through their academic projects for placement as well as carrier point of view"	17/07/2015 (01 Day)
18	2014-15	Two Days Workshop on RED HAT LINUX	17/08/2014 to 18/08/2015 (02 Days)
19		Seminar on "How to choose Project Topic"	06/09/2014 (01 Day)
20	2013-14	Seminar on "Software Testing"	15/03/2014 (01 Day)
21		Workshop on " Java Programming"	21/09/2013 (01 Day)

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Rajgad Dnyanpeeth's
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Department of Computer Engineering

NOTICE

All Second Year students are hereby informed that Workshop on "Programming Languages-I (C and C++)" of One Week has been organized from 5th to 10th June, 2017at 10.00 am. All are instructed to be present for the same.

RDTC, Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Prof. M. B. Wagh

HOD

H.O.D
DEPTT. OF COMPUTER ENGG.
RDTC, Shri Chhatrapati Shivajiraje
College of Engineering, Dhangwadi,
Pune- 412206.

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Dr. Bhagyashree s. Patil
Hon. secretary
Anantrao Thopte
Founder President
Ex. Education Minister
Maharashtra State

INVITATION LETTER

Date: - 01/06/2017

To

Prof. N. J. Bhojane

Infinity Solutions Pvt. Ltd. Pune

Subject: Invitation for conducting Workshop on **"Programming Languages-I(C, C++)"**

Respected sir,

This gives Department of Computer Engineering of SCSCOE, great pleasure to request you to conduct workshop on Programming Languages-I (C and C++) for Second Year students in RD'S SCSCOE, Dhangawadi. We will be thankful to you if you can schedule it from 5th June 2017.

Waiting for your positive reply.

Received
NBhojane

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Prof. M. B. Wagh
HOD
Head of Department
Dept. of Computer Engineering
Shri Chh. Shivajiraje College of Engg.
Dhangawadi, Pune-412206

Gat No. 237, Pune Bangalore High-way, Dhangawadi, Tal. Bhor, Dist. - Pune. Pincode - 412206. Telefax. : 02113-282456 / 556 / 656
Email : scscoe@gmail.com Website : www.scshivajirajecoe.com

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Hon. secretary
Anantrao Thopte
Founder President
Ex. Education Minister
Maharashtra State

CONDUCTION LETTER

Date: - 10/06/2017

To,

Prof. N. J. Bhojane

Infinity Solutions Pvt. Ltd. Pune

We express our immense gratitude for having you at our college to conduct a fabulous sessions on **"Programming Languages-I(C, C++)"**. It was our pleasure for having a person like you at our institute. We take this opportunity to tell you this with pride that our student thoroughly enjoyed your entire sessions. We would like to know if you ever need our support.

Thank You so much.

Received
NBhagyare

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Prof. M. B. Wagh
Head of Department
HOD
Dept. of Computer Engineering
Shri Chh. Shivajiraje College of Engg.
Dhangawadi, Pune-412206

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Dhangwadi, Tal-Bhor, Dist. – Pune – 412206.
Department of Computer Engineering

Schedule for Workshop on "PROGRAMMING LANGUAGES-I (C, C++)"

DAY 1 DATE: 05/06/2017

DAY & SESSION	TIME	CONTENTS/ACTIVITY
DAY 1 MORNING SESSION	10.00 am to 11.00 am	Inauguration session and well come to guests
	11.00 am to 11.15 am	**Tea Break**
	11.15 am to 01.30 am	**Introduction of C Language** • C Programming Under TurboC • Working under LINUX • Introduction to C compiling under LINUX • Compilation Steps • Introduction to anatomy of Simple C program
	01.30 pm to 2.00 pm	**Lunch Break**
DAY 1 AFTERNOON SESSION	02.00 pm to 05.00 pm	**C Operators** • Arithmetic Operators • Relational Operators • Logical Operators • Unary Operators • C language Opeartor Precedence Chart • Declaration of Storage Class **Character Variable** • ESCAPE character (OR) Special Character • Readymade functions to manipulate Symbolic Information
END DAY 1		
DAY 2 - DATE: 06/06/2017		
DAY 2 MORNING SESSION	10.30 am to 01.30 pm	**Control Structure** • The if condition • Labels • The goto statement • Switch Construct

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	01.30 pm to 02.00 pm	**LUNCH BREAK**
DAY 2 AFTERNOON SESSION	02.00 pm to 05.00 pm	**While Loop** • The while loop • The break statement • Continue Statement • Nested While Loops **The do-while Loop** **For Loop**
END DAY 2		
DAY 3 – DATE: 07/06/2017		
DAY 3 MORNING SESSION	10.30am to 01.30 pm	**Arrays** • One dimensional Array • Two Dimensional Array • Multi- dimensional Array **Function** • Introduction • Execution of program using Function • Passing 1-D Array • Passing 2-D Arrays to Function
	01.30 pm to 02.00 pm	**LUNCH BREAK**
DAY 3 AFTERNOON SESSION	02.00 pm to 05.00 pm	**Recursive Functions** • Introduction • Mutual Recursive • Tail Recursive **Pointers** • Introduction • Passing Pointers to Functions • Dynamic Memory Allocation • Precedence of Operators on Pointers and Arithmetic of pointers
END DAY 3		

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Department of Computer Engineering

DAY & SESSION	TIME	CONTENTS/ACTIVITY
DAY 4 MORNING SESSION	10.00 am to 1.30 pm	**Beginning with C++** 1. Introduction 2. Simple program in C++ 3. Structure of C++ Program 4. Compilation and Linking **Tokens , Expression and Control Structures** • Introduction • Tokens • Basic Data types • User-defined Data types • Derived Data types • Scope Resolution Operator
	01.30 pm to 02.00 pm	**LUNCH BREAK**
DAY 4 AFTERNOON SESSION	02.00 pm to 05.00 pm	**Function in C++** • Introduction • Inline Function • Function Prototyping • Call By Reference • Inline Functions • Function Overloading • Friend Function **Classes and Objects** • Introduction • A C++ program with classes • Arrays within classes • Use of Data members and member functions
END DAY 4		
DAY 5 - DATE: 09/06/2017		
	10.00 am to 01.30 pm	**Constructors and Destructors** • Introduction • Constructors • Parameterized Constructor • Copy Constructors

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DAY 5 MORNING SESSION		• Constructor with Default Argument • Destructors **Operator Overloading** • Introduction • Defining Operator Overloading **Inheritance** • Introduction • Defining Derived Classes • Types of Inheritance
	01.30 pm to 02.00 pm	**LUNCH BREAK**
DAY 5 AFTERNOON SESSION	02.00 pm to 05.00 pm	**Pointers, Virtual Functions and Polymorphism** • Introduction • Pointers • Pointers to Objects • This Pointer • Pointers to derived classes • Virtual Functions
END DAY 5		
DAY 6 – DATE: 10/06/2017		
DAY 6 MORNING SESSION	10.00am to 01.30 pm	**Working with Files** • Introduction • Classes for File Stream Operators • Opening and Closing Files • Detection end-of –file • File Pointer and their manipulations • Updating Files • Error Handling during File Operations • Command Line Arguments
	01.30 pm to 02.00 pm	**LUNCH BREAK**
		Templates • Introduction • Class Templates • Function Templates **Exception Handling**

DAY 6 AFTERNOON SESSION	02.00 pm to 05.00 pm	• Introduction • Basics of Exception Handling • Exception Handling Mechanism • Throwing Mechanism • Catching Mechanism • Rethrowing Mechanism • Specifying Exception
END DAY 6		

Prof. P. S. Nagale
Co-ordinator

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.
RDTC

7/04/2017

Prof. M. B. Wagh
HOD

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Pune- 412206.

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Department of Computer Engineering

Workshop on "Programming Languages-I (C, C++)".

Student Attendance Sheet

Sr. No.	Name of Student	05/06/2017		06/06/2017		07/06/2017	
		Session1 Sign	Session2 Sign	Session1 Sign	Session2 Sign	Session1 Sign	Session2 Sign
1	Asabe Mayuri Ashok	Asabe	Asabe	Asabe	Asabe	Asabe	Asabe
2	Bhate Rohan Prasannakumar	Rohan	A	A	Rohan	Rohan	Rohan
3	Bhutkar Aishwarya Raghunandan	AL	AL	AL	AL	AL	AL
4	Damgude Diptee Arun	Diptee	Diptee	Diptee	Diptee	Diptee	Diptee
5	Deshmane Akshata Sanjay	Deshm	Desh	Desh	Deshm	Deshm	Deshm
6	Deshmane Manoj Chandrakant	A	A	A	A	A	A
7	Devalekar Komal Suresh	KDD.	KDD.	KDD.	KDD.	KDD.	KDD.
8	Dhanawale Sagar Dnyanoba	D	D	D	D	D	D
9	Dhondge Kaustubh Virendra	A	A	A	A	A	A
10	Ghule Ajay Dinkar	Ajay	Ajay	Ajay	Ajay	Ajay	Ajay
11	Kadekar Gausmohammad Innuskhan	ABSENT					
12	Khude Ankita Sunil	Khude	Khude	Khude	Khude	Khude	Khude
13	Khude Dipali Chhaban	Dhde	Dhde	Dhde	Dhde	Dhde	Dhde
14	Kumbhar Akshay Gurudev	Akshay	Akshay	Akshay	Akshay	Akshay	Akshay
15	Mhasavade Arati Milind	Amhasavade	Amhasavade	Amhasavade	Amhasavade	Amhasavade	Amhasavade
16	More Ajinkya Namdeo	More	More	More	More	More	More
17	Patil Pavan Dhanaji	Pavan	Pvan	Pavan	Pavan	Pavan	Pvan
18	Patil Rupesh Ramesh	Rpatil	Rpatil	Rpatil	Rpatil	Rpatil	Rpatil
19	Pawar Snehal Laxman	Sshal	Sshal	Sshal	Sshal	Sshal	Sshal
20	Pawar Trupti Vikas	Pawan	Pawan	Pawan	Pawan	Pawan	Pawan
21	Pawar Vaishali Sanjay	Pware	Pware	Pware	Pware	Pware	Pware
22	Phadnis Swapnali Sudhir	Phadnis	Phadnis	Phadnis	Phadnis	Phadnis	Phadnis
23	Phase Vishakha Audumbar	A	A	A	A	A	A
24	Roman Snehal Ravindra	Roman	Roman	Roman	Roman	Roman	Roman
25	Salekar Rupali Balu	Rsa	Rsa	Rsa	Rsa	Rsa	Rsa
26	Salunke Pragati Sampat	Pragati	Pragati	Pragati	Pragati	Pragati	Pragati
27	Sathe Sunny Somnath	A	A	A	A	A	A
28	Shaikh Tamanna Anwar	Shaikh	Shaikh	Shaikh	Shaikh	Shaikh	Shaikh
29	Shinde Tejaswini Popat	Tsp	Tsp	Tsp	Tsp	Tsp	Tsp
30	Shivankar Ankita Vinayak	A	A	A	A	A	A
31	Surve Ashlesha Devidas	Shirve	Shirve	Shirve	Shirve	Shirve	Shirve

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Department of Computer Engineering

Workshop on "Programming Languages-I (C, C++)".

Student Attendance Sheet

Sr. No.	Name of Student	08/06/2017		09/06/2017		10/06/2017	
		Session1 Sign	Session2 Sign	Session1 Sign	Session2 Sign	Session1 Sign	Session2 Sign
1	Asabe Mayuri Ashok	Asabe	Asabe	Asabe	Asabe	Asabe	Asabe
2	Bhate Rohan Prasannakumar	Rohan	Rohan	Rohan	Rohan	Rohan	Rohan
3	Bhutkar Aishwarya Raghunandan	AL	AL	AL	AL	AL	AL
4	Damgude Diptee Arun	Diptee	Diptee	Diptee	Diptee	Diptee	Diptee
5	Deshmane Akshata Sanjay	Deshmane	Deshmane	Deshmane	Deshmane	Deshmane	Deshmane
6	Deshmane Manoj Chandrakant	A	A	A	A	A	A
7	Devalekar Komal Suresh	KD.	KD.	KD.	KD.	KD.	KD.
8	Dhanawale Sagar Dnyanoba						
9	Dhondge Kaustubh Virendra	A	A	AB	AB	AB	AB
10	Ghule Ajay Dinkar	Ajay	Ajay	Ajay	Ajay	Ajay	Ajay
11	Kadekar Gausmohammad Innuskhan	ABSENT					A
12	Khude Ankita Sunil	Khude	Khude	Khude	Khude	Khude	Khude
13	Khude Dipali Chhaban	Dhude	Dhude	Dhude	Dhude	Dhude	Dhude
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16	More Ajinkya Namdeo	More	More	More	More	More	More
17	Patil Pavan Dhanaji	Pavan	Pavan	Pavan	Pavan	Pavan	Pavan
18	Patil Rupesh Ramesh	Rpatil	Rpatil	Rpatil	Rpatil	Rpatil	Rpatil
19	Pawar Snehal Laxman	Shal	Shal	Shal	Shal	Shal	Shal
20	Pawar Trupti Vikas	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar
21	Pawar Vaishali Sanjay	Vpawar	Vpawar	Vpawar	Vpawar	Vpawar	Vpawar
22	Phadnis Swapnali Sudhir	Phadnis	Phadnis	Phadnis	Phadnis	Phadnis	Phadnis
23	Phase Vishakha Audumbar	A	A	A	A	A	A
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Department of Computer Engineering

Report of Workshop On "Programming Languages - I (C, C++)"

DEPARTMENT	:	Computer Engineering
RESOURCE PERSON	:	Prof. N. J. Bhojane (Infinity Solutions Pvt. Ltd. Pune)
TITLE/TOPIC	:	"Programming Languages - I (C, C++)"
DATE	:	05/06/2017 to 10/06/2017
DURATION OF EVENT	:	10.00 AM to 5.00 PM
STUDENT PRESENT	:	30
CO-ORDINATOR	:	Prof. P. S. Nagale
PROGRAM OBJECTIVE	:	***"To understand concepts of C and C++"***
CONTENTS	:	

A. Introduction of C Language

1. C Operators
2. Control Structure
3. Loops
4. Arrays
5. Function
6. Pointers

B. Beginning with C++

1. Tokens , Expression and Control Structures
2. Function in C++
3. Classes and Objects
4. Operator Overloading
5. Inheritance
6. Pointers, Virtual Functions and Polymorphism
7. Working with Files
8. Templates
9. Exception Handling

PROGRAM OUTCOMES : Students will understood the concept of C language and C++ Programming Language:

Photo During Session :

Prof. P. S. Nagale
Co-ordinator

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Pune
412205
Shri Chhatrapati Shivajiraje College of Engg.

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Shri. Sreenivas Kunapuli
Vice President,
Softerland Global Services

Dr. Vaishali Shimpi
Scientist,
Advanced Data Processing Research Institute (ADRIN),
Hyderabad.

Dr. V.N. Mani
Scientist-E,
Centre for Materials for
Electronics Technology (C-MET),
Hyderabad.

Zhang Dao Hua
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Nanyang Technological University,
Singapore.

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Abstract Submission	10th April 2018
Registration	15th April 2018
Full Paper Submission	18th April 2018
Conference Date	20th - 21st April 2018

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Prof. Mrs. J. G. Kale, Head, Dept. of First Year Engineering

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Categories	Fee for participants	
	National	International
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Cognitive radio networks, wireless mobile communication and technologies, Embedded & wireless system

Electrical and Electronics Engineering-Power electronics, Power system protection, Facts electrical communication system, Electric Vehicles, Renewable energy, Power quality

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Key Note Speaker

Dr. Suryakant Patil

Director, PSP- IP & Associates Pvt. Ltd., Pune

Submission of Abstract / Full Paper

Paper submission Due- **15th April 2019**
Acceptance Notification - **18th April 2019**
Author registration - **20th April 2019**
Camera ready Submission -**21st April 2019**
Conference Date-**25th - 26th April 2019**

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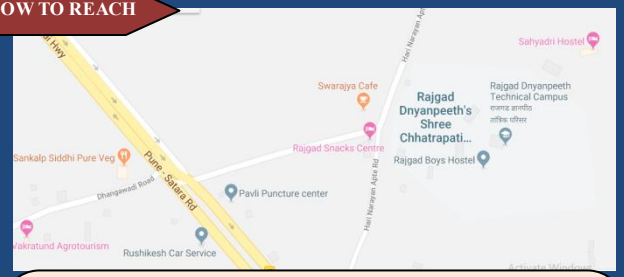

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List of Guest Lectures 2017-18

Department of Computer Engineering

Sr. No.	Year	Subject	Name of Expert	Date	Total No. Students
1.	2017-18	Computer Graphics-3D Transformation	Prof. S. P. Bholane	12/03/2018	30
2	2017-18	Web Technology	Dr. S. U. Kadam	01/03/2018	30
3.	2017-18	Guidance for competitive examinations	Mr. Shrirang D. Mandlik	22/09/2017	141
4	2017-18	Android App Development	Mr. Ganesh Lahane	01/09/2017	20
5.	2017-18	Discrete Mathematics-Trees	Dr. P. R. Futane	05/08/2017	30

Rajgad Dnyanpeeth's
DTE:6324
SPPU:4071
Dhangawadi
Pune
412206
Shri Chhatrapati Shivajiraje College of Engg.

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department of Computer Engineering

Date-09/03/2018

NOTICE

All final year students are hereby informed that guest lecture on **"Computer Graphics-3D Transformation"** has been organized on 12th Mar. 2018 at 11.00 am. All are instructed to be present for the same.

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Prof. M. B. Wagh

HOD

॥ प्रज्वलितो ज्ञानमयः प्रदिपः ॥
Rajgad Dnyanpeeth's
Shri Chhatrapati Shivajiraje College of Engineering
Approved by AICTE, Govt of Maharashtra and Affiliated to the University of Pune (ID NO PU/PN/Engg/376/2009)
Dr. Bhagyashree s. Patil
Hon. secretary
Anantrao Thopte
Founder President
Ex. Education Minister
Maharashtra State

Department of Computer Engineering

INVITATION LETTER

Date: - 24/08/2017

To

Prof. S. P. Bholane,

SCOE, Vadgaon(Bk.),

Pune.

Subject: Invitation for conducting guest lecture on **"Computer Graphics-3D Transformation"**

Respected Sir,

This gives Department of Computer Engineering of SCSCOE, great pleasure to request you to conduct guest lecture on "**Computer Graphics-3D Transformation**" for third Year students in RDTC-SCSCOE, Dhangawadi. We will be thankful to you if you can schedule it on 12th Mar. 2018.

Waiting for your positive reply.

Prof. M. B. Wagh

HOD

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Received
Bholane

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Department of Computer Engineering

Report of Guest Lecture On "Computer Graphics-3D Transformation"

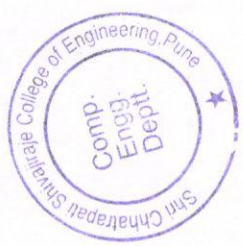
DEPARTMENT	:	Computer Engineering
RESOURCE PERSON	:	Prof. S. P. Bholane (SCOE, Vadgaon, Pune)
TITLE/TOPIC	:	"Computer Graphics-3D Transformation"
DATE	:	12/03/2018
DURATION OF EVENT	:	11.00 AM to 2.00 PM
STUDENT PRESENT	:	30
CO-ORDINATOR	:	Prof. R. B. Nangare

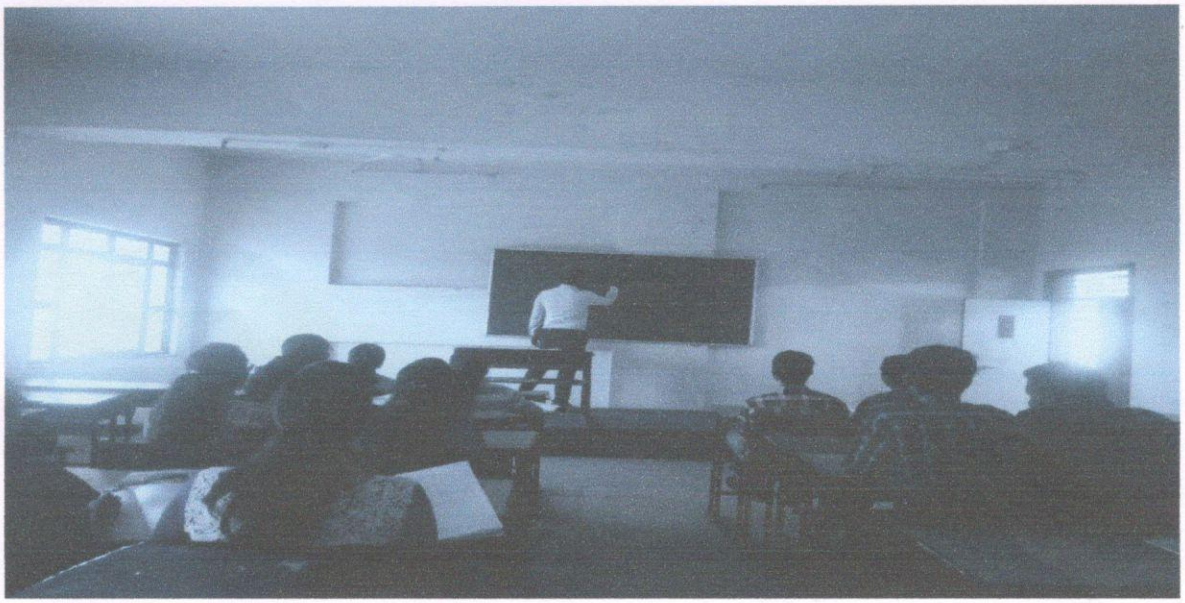
PROGRAM OBJECTIVE : **"To understand and apply various methods and techniques regarding projections, animation, shading, illumination and lighting".**

CONTENTS :

1. 3-D Transformation
2. 3-D Clipping
3. Projection.
4. Design of Animation sequences.

PROGRAM OUTCOME : ***"Students will be able to develop scientific and strategic approach to solve 3D transformation complex problems in the domain of Computer Graphics".***





Prof. Nangare R. B.
Coordinator

Prof. M. B. Wagh
HOD

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Dept.

।। प्रज्वलितो ज्ञानमयः प्रदिपः ।।

Rajgad Dnyanpeeth's

Shri Chhatrapati Shivajiraje College of Engineering

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Dr. Bhagyashree s. Patil
Hon. secretary

Anantrao Thopte
Founder President
Ex. Education Minister
Maharashtra State

CONDUCTION LETTER

Date: - 12/03/2018

To

Prof. S. P. Bholane,

SCOE, Vadgaon(Bk.),

Pune.

We express our immense gratitude for having you at our college to conduct a fabulous sessions on **"Computer Graphics-3D Transformation"**. It was our pleasure for having a person like you at our institute. We take this opportunity to tell you this with pride that our student thoroughly enjoyed your entire sessions. We would like to know if you ever need our support.

Thank You so much.

Shri Chhatrapati Shivajiraje College of Engineering, Pune
Comp. Engg. Deptt.

Prof. M. B. Wagh

HOD

Received

Bholane

17. INDUSTRY SPONSORED INTERNSHIPS

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

Details of Internship Programme

Department of Electronics and Telecommunication Engineering

Sr. No.	Academic Year	Company Name	Student Details	Class	Duration
1	2018-19	L&T	Shradhha Satish Jadhav	BE	25/01/2019 to 23/02/2019
2		TE Conncetivity	Mhaske Prasad Dilip	BE	27/08/2018 to 28/9/2018
3		Savita Machine Tools PVT. LTD	Mhaske Prasad Dilip	BE	24/8/2018 to 8/2/2019
4		VCB Electronics	Khot Sweeti Laxman More Sayali Laxman Pangare Sandhya Anil	TE	18/06/2018 to 4/7/2018
5		Dhruva Automation and Controls PVT. Ltd.	Deshpande Prathmesh vikas Golgiri Bharti Babu Ingale Shravani Ankush	TE	2/6/2018 to 22/06/2018
6	2017-18	Dhruva Automation and Controls PVT. Ltd.	Dighe Tanaji Suresh Gujar Manali Shekhar Bhosale Sayali Sambhaji	TE	1/6/2017 to 15/6/2017
7		VCB Electronics	Mhaske Prasad Dilip Dhanawade Tejas Sakharam Jagtap Alankar Pandurang	TE	15/6/2017 to 1/7/2017
8	2016-17	Dhruva Automation and Controls PVT. Ltd.	Shivtare prajakta Chandrakant Vare Jyotsna Ananda Yadav Yogesh Suresh	TE	1/6/2016 to 25/6/2016

9	2015-16	VCB Electronics	Margaje Akshada Anil Newase Amol Dattatray Tapase Pooja Suryakant	TE	22/6/2015 to 7/7/2015
10	2014-15	VCB Electronics	Poval Ravsaheb Vikram Rasal Govind Ashroba Thopate Bhagyashree Subhash	TE	20/6/2014 to 5/7/2017

VCB

Memorandum of Understanding between VCB Electronics Pvt. Ltd.

&
RD's SCSCOE

This Memorandum of Understanding (hereinafter referred to as "MoU") is entered into on this date 24th June 2014

Between:

VCB Electronics Pvt. Ltd., Gat No. 760, Khed Shivapur, Tal-Haveli, Dist-Pune 412205(hereinafter referred to as "Industry")

And

RD's Shri Chhatrapati Shivajiraje College of Engineering-Bhor, Dist—Pune, Maharashtra, (hereinafter referred to as "The College") an institution of higher learning founded in 2009 Affiliated to **Savitribai Phule Pune University's Approved by AICTE, New Delhi.**

The College and The Industry shall be collectively referred to as "The Parties"

In furtherance of their mutual interest in improvement of Academics, Technical Enhancements and Improvising Employability Skills of the students as a contribution to the Social and Economic development of the region, The Parties mentioned above hereby agree to and adopt the following Memorandum of Understanding.

Article 1: The Purpose of the Agreement

The Parties are committed to enhancement of academic skills of the students of the college, educational excellence, collaborative work, intellectual freedom and equality of educational and employment opportunities.

Some broad goals of this MoU are:

1. Take into consideration the aspects of the subject required by the industries for possible future inclusion in the curricula
2. Enhance the understanding of the students through field experience
3. Make students independent and responsible towards learning and social inclination
4. Build a network of learning community & Industries.

Article 2: General Activities and Services

The Parties will voluntarily undertake the following:

1. Create scope for curriculum development and enrichment
2. Encourage joint research activities
3. Extension Activities and dissemination of new knowledge

VCB

Article 3: VCB Electronics Pvt. Ltd., Pune

Following are the roles identified

1. Provide opportunities for students and faculty members to upgrade their skills in allied industries.
2. Grant access to the industry its facilities as and when required with prior approval
3. Voluntarily Support research efforts in exploring new ideas.
4. Initiate and support exchange of human resource on case to case basis.

Article 4: Role of the College

Following are the roles identified for The College

1. Provide academic support to the Industry.
2. Provide assistance in the form of student interns as and when required.
3. Support and promote employees to pursue their higher education.
4. Initiate and support exchange of human resource on case to case basis.

Article 5: Duration and Termination of MoU

This MoU shall remain in force for a period of ten years commencing from the date of signing of this document. The Parties reserve the right to terminate this MoU by either party giving one month written notice to the other. Where such termination occurs, the provisions of this Memorandum shall continue to apply to ongoing activities until their completion.

Article 6: Amendments

Amendments to this MoU must be in writing and approved by the designated representatives of each party. The terms / clauses / articles in this MoU can be reviewed by mutual consent by serving one month written notice to the other party. New or amended terms / clauses / articles may be agreed as part of a renewed MoU.

Article 7: Statement of Intent

Nothing in this MoU shall be construed to as creating any legal relationships between The Parties. This MoU is a statement of intent to foster genuine and mutually beneficial collaboration.

Authorized Sign & Seal

VCB ELECTRONICS PVT. LTD. PUNE

Authorized Sign & Seal

Principal

Rajgad Dnyanpeeth's

Shri Chhatrapati Shivajiraje College of Engg.,

Dhangawadi, Pune-412206

VCB Electronics Pvt. Ltd.

Gat No. 760, Khed Shivapur, Tal.: Haveli, Dist.: Pune - 412205.

Phone : +91 20 66702000 **Fax :** +91 20 66702044

E-mail : [redacted] vcbmarketing@vcbelec.com

VCB

Date: 05/07/2017

TO WHOM IT MAY CONCERN

This is to certify that,

Mr. Mhaske Prasad Dilip

Mr. Dhanawade Tejas Sakharam

Mr. Jagtap Alankar Pandurang

students of T. E. E&TC from 'Rajgad Dnyanpeeth Technical Campus Shri Chhatrapati Shivajiraje College of Engineering have successfully completed 15 days **(15th June 2017 to 01th July 2017)** long training programme at this company.

During the period of training programme with us we found the students punctual, hardworking & inquisitive.

We Wish the Interns a Very Successful Future.

Warm Regards,

For VCB Electronics Pvt. Ltd.

Director

VCB ELECTRONICS PVT. LTD. PUNE

VCB Electronics Pvt. Ltd.

Gat No. 760, Khed Shivapur, Tal.: Haveli, Dist.: Pune - 412205.
Phone : +91 20 66702000 **Fax :** +91 20 66702044

18.SEMINARS TO PRAMOTE PRESENTATION SKILLS

Rajgad Dnyanpeeths

Shri Chhatrapati Shivajiraje College of Engineering, Dhangawadi

Department of Mechanical Engineering

ACADEMIC YEAR: 2017-18

Seminar Topic List of T.E. Mechanical

Sr.No.	Roll No	Name of Student	Seminar Topic	Guide
1	1734001	Mahangare Vipul Shrirang	Hydrogen IC Engine	Prof. S.K.Pawar
2	1734002	Chaudhari Vinod Ashok	Friction Stir Welding	
3	1734003	Dhanawade Rahul Suresh	Intelligent Vehicles	
4	1734004	Devghare Avinash Vasant	Collision mitigation braking system	
5	1734005	Kamthe Vishal Ramesh	Eco-friendly three wheelar solar car	
6	1734006	Nikam Saurabh Gangadhar	Osmotic power generation	
7	1734007	Chavan Akshay Deshraj	Stealt and Counter stealth Technology	
8	1734008	Deshmukh Kishor Rajendra	Magnetic gear drive	Prof. S.M.Mane
9	1734009	Mane Dhananjay Bharat	Advances in car safety	
10	1734010	Salunkhe Ganesh Bajirao	Implementation of TPM in Industry	
11	1734011	Gaikwad Jalindar Suresh	Cryogenic treatment disc brakes	
12	1734012	Saste Akshay Ashok	Automatic transmission gear	
13	1734013	Chavan Tushar Namdeo	Study of Dynamic Speed Governor	
14	1734014	Salunke Aditya Kailas	Computational Fluid Dynamics In Food Processing Ind.	
15	1734015	Jagtap Ganesh Mahadev	Latest trends in solar energy	Prof. N.R. Badgujar
16	1734016	Jadhav Akshay Ramchandra	Ultrasonic metal welding	
17	1734017	Gaikwad Akshay Balkrishna	Supercavitation	
18	1734018	Nikam Suraj Sanjay	Turbofan Engine	
19	1734019	Dhane Nikhil Prakash	Hydrogen based vehicles	
20	1734020	Gawade Akshay Anil	Two stroke engine for reed valves	
21	1734021	Shirke Rahul Laxman	Automation of tapping machine	
22	1734022	Jadhav Chetan Anil	Regenerative braking system	Prof.C.S.Gaikwad
23	1734023	Surpur Siddharth Somnath	Effect of micro-alloying elements on the microstructures and mechanical properties	
24	1734024	Dhavale Ajinkya Prakash	A comprehensive study of weight reduction technologies for performance improvement in automobile	
25	1734025	Newase Ashvin Bapuso	Study of biofuel ethanol 85 It's applications	
26	1734026	Sutar Tushar Prabhakar	Application of magneto rheological fluid	
27	1734027	Kamthe Sanket Kailas	Solar power tower and its applications	
28	1734028	More Akshay Madhukar	Advancement in 3D printing for 4D printing technology	
29	1734029	Sonawane Amit Anil	Burnishing of aerospace alloys	Prof.D.B.Misal
30	1734030	Paygude Nikita Bhikoba	Pedestrain airbag system	
31	1734031	Chavan Sumit Vilas	Autopilot mode in vehicle	
32	1734032	Chikane Prajakta Dattatray	Friction welding	
33	1734033	Garud Vaibhav Hanumant	Turbofan Engine	
34	1734034	Dal Amar Kishor	Electronic fuel injection	
35	1734035	Yadav Shubham Bhanudas	Magnetic Refrigeration	
36	1734036	Bhsoale Prasad Sadashiv	Electric discharge machining	Prof.A.P.Sonawane
37	1734037	Dagade Pramod Bhaguji	Frictionless compressor	
38	1734038	Thorat Omkar Devidas	Evaluate the performance and emission using EGR method	
39	1734039	Kank Suraj Kisan	Non-convensional Energy Sources	
40	1734040	Mujawar Mubin Jabir	Cryocar	
41	1734041	Kumbhar Sadanand Krishanat	Cryogenic grinding	
42	1734042	Gaikwad Sachin Rajendra	cryogenic heat treatment	

43	1734043	Yadav Avinash Dnyandev	3D Printing	Prof.S.B.Jadhav
44	1734044	Kale Samadhan Dattatray	Orbital welding	
45	1734045	Kadam Hemant Valmik	Advance towed artillery gun system	
46	1734046	Tegimali Pramod Mahalinga	Active magnetic bearing	
47	1734047	Gole Suraj Manohar	Replacement of Li-ion battery by using graphene material	
48	1734048	Chavan Amit Vilas	Hybrid vehicle	
49	1734049	Kudale Kiran Kailas	Military Radar system	
50	1734050	Sawant Shekhar Nanda	Solar operated sprayer	Prof.L.P.Maskepatil
51	1734051	Thakur Ganesh Shahaji	Inspection using vision system	
52	1734052	Talekar Amar Pramod	Heating, ventilation and air conditioning in automobile	
53	1734053	Pawashe Pratik Sunil	Sky bus technology	
54	1734054	Jedhe Vikrant Suresh	Autopilot system in car using proximity sensors	
55	1734055	Mohite Amar Raju	Semi robotic legs	
56	1734056	Patil Amarjit Dilipkumar	Cryogenic hardening	
57	1734057	Jagtap Dattatray Vitthal	Recycled fibre composites as reinforcement for thermosets	Prof.R.R.Biradar
58	1734058	Khutwad Jeevan Sharad	Natural fiber based thermoplastic and thermosets composites	
59	1734059	Kharat Rajesh Bajrang	Pneumatic forging machine	
60	1734060	Korade Vicky Suryakant	Exhaust gas recirculation	
61	1734061	Bhikule Rajan Tanaji	Aircraft hydraulic system	
62	1734062	Potekar Pratik Dattatray	Open loop geothermal cooling or commercial air conditioning system	
63	1734063	Sutar Sangram Sunil	System vibration and its control	
64	1734064	Bhandare Rohan Balkrishna	Handfree driving	Prof.R.S.Lawate
65	1734065	Giri Pandurang Gautam	Robonaut	
66	1734066	Talekar Akshay Maruti	Automatic vehicle locator	
67	1734067	Mahato Rajan Suresh	Paper battery	
68	1734068	Kumbhar Shireesh Nivrutti	Nano technology	
69	1734069	Yewale Sahil Sunil	Microturbine future power generation	
70	1734070	Warkhade Aniket Mahadev	Aqua silencer	
71	1734071	Chandanshiv Akshay Gajanan	Fuel from plastic waste	Prof.R.V.Lalge
72	1734072	Shirke Pranav Rajesh	Mechanical Energy Storage	
73	1734073	Vaze Hrushikesh Purushottam	Air compresed engine	
74	1734074	Masurkar Vishal Kailas	Study Structural Analysis Of Dragonfly Wing	
75	1734075	Chavan Vikas Dashrath	Free piston engine linear generator	
76	1734076	Jadhav Ritesh Navnath	Automation	
77	1734077	Waghole Akash Pralhad	Vibratory sand screening machine	
78	1734078	Khopade Mukund Pandurang	Magnetic refrigeration	Prof.D.A.More
79	1734079	Mahangare Susmit Kisan	Flying windmills	
80	1734080	Khatape Kunal Yashwant	The reinforcement of carbon nanotube in epoxy based CFRP composite	
81	1734081	Thopate Vaibhav Balasaheb	Green engine	
82	1734082	Kochale Akshay Sunil	Slipper clutch	
83	1734083	Jadhav Priyanka Suhas	Hyperloop	
84	1734084	Jarande Gaorav Dilip	Direct adaptive control system	
85	1734085	Thopate Yuvraj Dinkar	Industial robot	Prof.J.P.Borude
86	1734086	Virkar Akshay Dnyaneshwar	Centrifugal casting process	
87	1734087	Jadhav Vishal Sadanand	Personal rapid transit	
88	1734088	Jadhav Akshay Arun	Pollution less engines- sterlings engine	
89	1734089	Malusare Reshma Ramchandra	Minimum quantity lubrication system	
90	1734090	Mahangare Chetan Shivaji	Automatic air suspension	
91	1734091	Sangle Kuldipak Suresh	Direct metal laser sintering	

92	1734092	Shinde Saurabh Rajendra	Unmanned aerial vehicle and its applications	Prof.N.D.Bagul
93	1734093	Kumbhar Narendra Shrikant	Advanced SMART automobile safety information system	
94	1734094	Deshmukh Akshay Rajendra	Railway wagon braking system	
95	1734095	Jadhav Asmita Nathuram	Ocean thermal energy conversion	
96	1734096	Sayambar Ashvini Bhanudas	Free piston engine	
97	1734097	Khakal Suvarna Dilip	Underwater missile technology	
98	1734098	Borkar Sagar Narayan	Geothermal powerplant	
99	1734099	More Ganesh Sunil	Solar operated weeder machine	Prof.S.P.Bhide
100	1734100	Gosavi Prathamesh Ravindra	GPS and application	
101	1734101	Shirke Gajanan Shivaji	Smart EFI system using Magnetic Fuel Vaporizer	
102	1734102	Datir Akash Ganpat	Friction stir welding process	
103	1734103	Nikam Aishwarya Rajendra	Compressed Natural Gas for Vehicles	
104	1734104	Pilane Gorakshnath Haribhau	Thermal energy storage	
105	1734105	Ippe Nilesh Balaso	Solar energy trough solar space system	
106	1734106	Mandawe Akshay Popat	Low pressure thermocompressor	Prof.M.B.Bankar
107	1734107	Gholap Shubham Dilip	Plant irrigation water sprinkler	
108	1734108	Shete Shubham Balaso	Vertical machining centers	
109	1734109	YADAV VISHWAJEET SURESH	3 D machine vision system	
110	1734110	CHAVAN SANGRAM ANKUSH	Mobile robotic system	
111	1734111	PATIL RAHUL VIJAY	Blue Motion Technology	
112	1734112	KHOPADE OMKAR SHIVAJI	Multipurpose Agricultural Equipments	

HOD
Prof. Pawar S.K.

RDTC's Shri Chhatrapati Shivajiraje College of Engineering, Pune
Mech. Engg. Deptt.

HOD
Mechanical Engineering Dept
Shri Chhatrapati Shivajiraje
College of Engineering
Dhangawadi Tal. Bhor
Dist. Pune - 412206

19. MOU'S WITH VARIOUS INDUSTRIES/INSTITUTE

Rajgad Dnyanpeeth's

SHRI CHHATRAPATI SHIVAJIRAJE COLLEGE OF ENGINEERING

Gat No. 237, Pune Bangalore Highway, Dhangawadi, Tal – Bhor, Dist- Pune (Maharashtra)

List of MOU
Academic Year : 2017-18

We provide platform to advanced learners through technical MoU's with various reputed industries and institutes to explore their talents.

Sr. No.	Name of the partnering institution/ industry with contact details
1	VCB Electronics Pvt. Ltd. Address: Gat No.760,Khed Shivapur, Tal-Haveli, Dist-Pune.Pin-412205
2	Genius World Centre Pvt. Ltd.,Pune, Address: Office No.402, 3rd Floor ,Dangat Patil Empire, Near Navle Bridge,Narhe, Pune-411041
3	Dhruva Automation & Control Private Ltd Address: 401-A, Sai Shilpa Buisness Center,Baner, Pune-411045. Contact No-8600537766
4	Ascent technology Address: Unnamed Road, Vivek Nagar, Balaji Nagar, Pune, Maharashtra 411043 Phone: 020 2437 2437
5	Excel Technologies Address: Row House A-2,Greenwoods, Opp.Bharati Vidyapeeth, Pune-Satara Road, Katraj, Pune, Maharashtra 411043 Phone: 077980 58282
6	Sarvesh Construction Company ,Engineers and Government Contractors Address: Home Office-At Padmavati ,Post Bhuinj,Tal-Wai, Dist-Satara. Contact No.-02352225521

7	Anant Dudh Pvt. Ltd. Address: Gat No.263, A/p Kikavi, Tal-Bhor, Dist-Pune. Pin-412206 Tel. No.:02113-202242 Email id-anant_dudh@yahoo.co.in
8	Reliance Home Finance Ltd. Address: F1, 1st Floor, The mertropole, Bund garden road (Adjaccent to Inox Mulyiplex) Pune-411001
9	Ekdant Construction & Developers Address: Office No.61 to 63 ,Anand Plaza, Taradatta Park, Pune-Saswad Road, Saswad. Tel. No.-02115-222111 Email id-thesankalpgroup@gmail.com
10	Speed TechServe Pvt. Ltd. Address: (OPC) S.No.3/8,Opp.Vrundavan Hall,Vetalbuwa Chowk,Narhe,Pune-411041. Email id-info@speedtechserve.com
11	Rajgad Sahakari Sakhar Karkhana Ltd. Address: Anantnagar, At Post Nigade, Tal. Bhor, Dist. Pune-412205. Tel. No:02113-202202 Email id-rajgadsugarbhor@gmail.com