Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering Lonikand,wagholi,Pune
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE ENGINEERING

UnitTest–I

Class: S.E. **Semester-**I
Subject Name: Computer Graphics **Max Marks:** 20 14/10/22

Instructions:Attempt any FOUR of the following **(4x5)**

1) *Explain Frame Buffer with diagram?*
2) *Explain CRT and LCD with diagram.*
3) *Write DDA line drawing algorithm with example.*
4) *Define and explain the following terms:*
   a. *Pixel*
   b. *Rasterization*
   c. *Aspect Ratio*
   d.*Polygon*
5) *Explain any two Opengl commands with suitable example.*

******All The Best******

Shree Ramchandra Education Society's

Shree Ramchandra College of Engineering

Gat No. 351, Lonikand, Off Nagar Road, Pune - 412 216

Supplement No.:	14/10/2022 Supervisor's Signature & Date

Roll No. (In Figures) 23 Div.

Class : SE (AI & DS) Date : 14/10/22

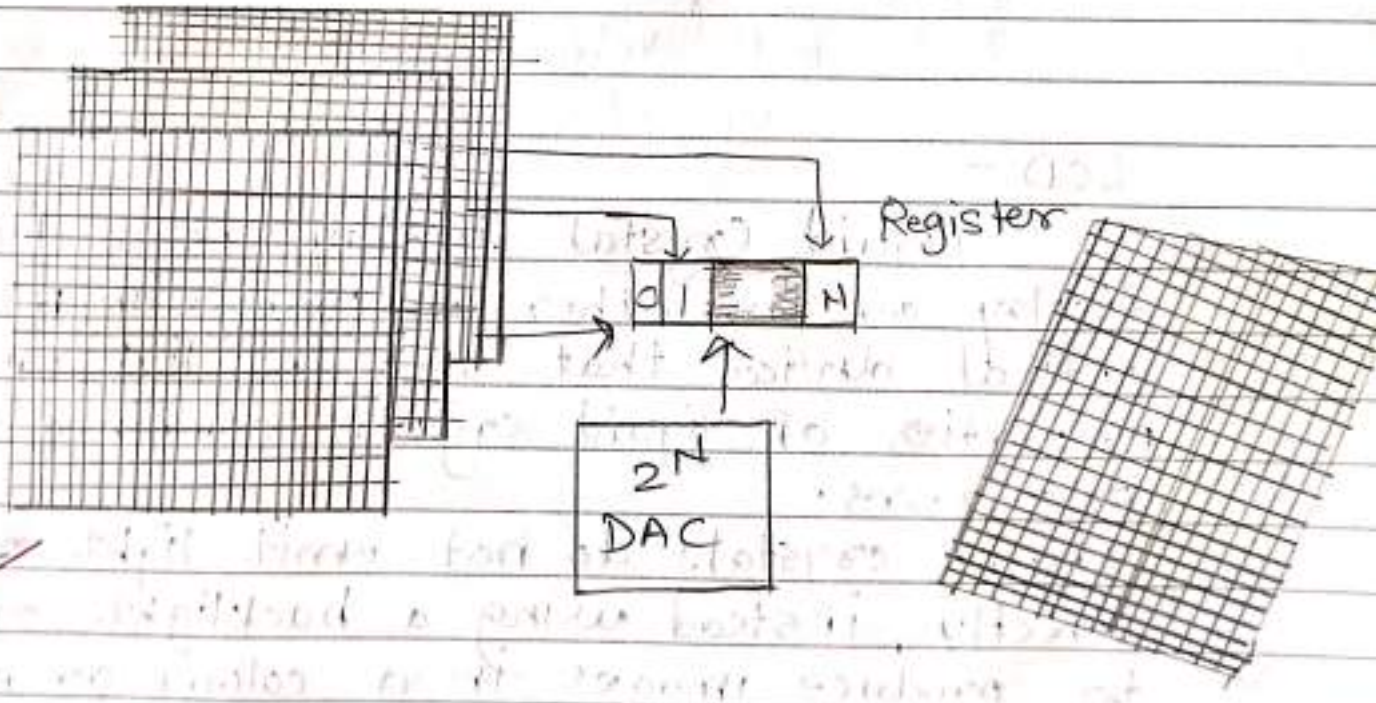
Subject : Computer Graphics 12/20

Q .1) Explain Frame buffer with diagram.

→ A frame buffer is a portion of random access memory (RAM) containing a bitmap that drives a video display. It is a memory buffer containing data representing all the pixels in a complete video frame.

Modern video cards ~~coi~~ contain framebuffer circuitary in their cores.

It is a part of random access memory.



Adv - ?

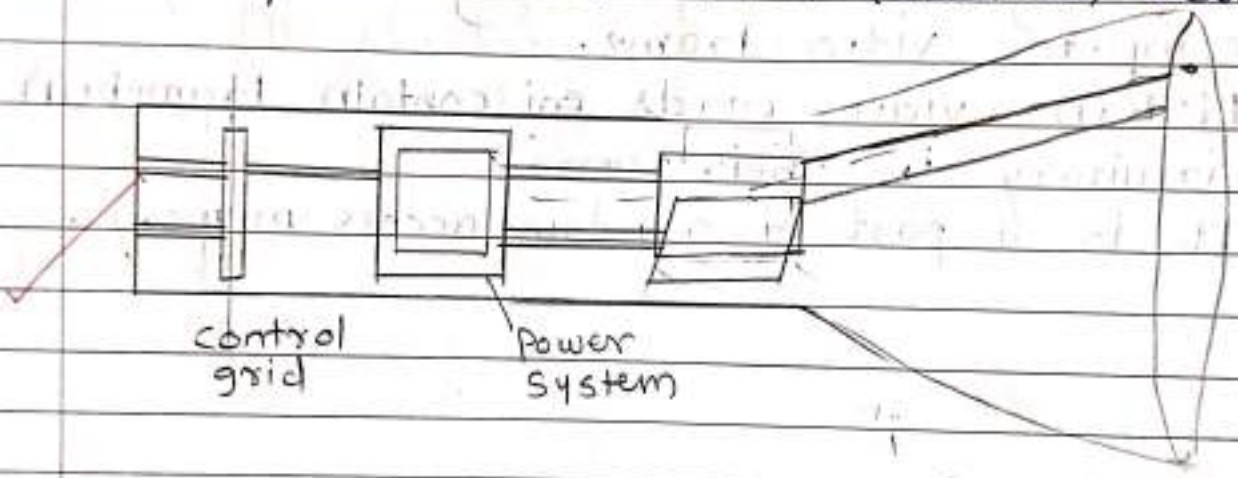
Q.2) Explain CRT and LCD with diagram.

→

CRT –

CRT (Cathode ray tube) is a specilized vaccum tube in which an image are produc contain one or more electrons which are use to emit electron beam strikes a phosphores surface.

Most computer display make use of CRTs. The CRT in a computer display is similar t the "picture tube" in a television receiver.



LCD –

Liquid Crystal display is a flat-panel display or the other electronically modulated optical device that uses the light-modulating properties of liquid crystal combined with polarizers.

Liquid crystals do not emit light ~~crystal~~ directly, instead using a backlight or reflector to produce images in a colour or monochrome.

4 dial

(Q.4)

d) Polygon –

Polygons are used in computer graphics to compose image that are three-dimensional in apperance.

Usually triangular, polygons arises when an object surface is modeled, vertices are selected and the object is rendered in a wire frame model.

Types of polygons :–

i) Concave Polygon –

A polygon ~~is~~ with one or more angle is greater than 180 degrees is knowns as concave polygon.

ii) Convex Polygon –

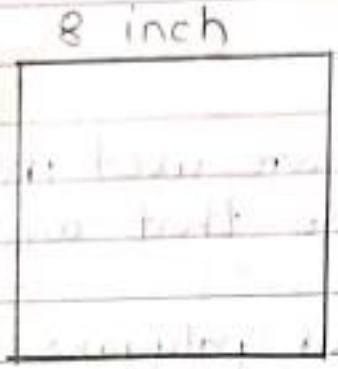
A polygon of which all interior angles are less than 180° degrees is known as Convex polygon.

a) Pixels –

Pixels are the smallest unit in ~~picture~~ ~~display~~ digital display. Upto millions of pixels make up an image or video on a devices screen. Each pixels comparieses a subpixel that emits a red, green and blue (RGB) colour which displays at different intensities.

c) Aspect Ratio –

Aspect ratio is the ratio of ~~weidht~~ to height. It is used in number fields but i.e most commonly used when ~~talking~~ talking about image.



Aspect ration = 8/6
= 1.33

b) Rasterization –

Rasterization or rasterization is the task of taking an image described in a vector graphics format and converting it into a raster image.

5

SRES's

SHREE RAMCHANDRA COLLEGE OFENGINEERING

Lonikand, Pune – 412216

Department of Artificial Intelligence and Data Science Engineering.

Termwork Assessment sheet

Class: SE **Sem: II** **Subject : DSAL(25 Marks)** **A.Y: 2021-2022**

Exam Seat No.	Name of Student	Total (25)	Submission(05)	Assessment Regularity (05)	Practical Performance (05)	Practical Attendance(05)	Theory Attendance(05)
S190962001	AHIRE RUPESH ASHOK	20	4	4	4	4	4
S190962003	BAGAL ADITYA GIRIDHAR	20	4	4	4	4	4
S190962004	BARKADE RUSHIKESH ATMARAM	23	5	4	5	4	5
S190962005	BENDRE RUSHANT BHAUSAHEB	20	4	4	4	4	4
S190962006	BHAGWAT SUDHAMANI SANTOSH	23	5	4	5	4	5
S190962007	BHIL SURAJ NAGNATH	23	5	4	5	4	5
S190962008	BHUJBAL PRASHANT SUBHASH	21	5	4	4	4	4
S190962009	BHUJBAL SANKET MOHAN	21	5	4	4	4	4
S190962010	BOMBLE SAKSHI MAHADEV	22	4	5	4	4	5
S190962011	BORSE DARSHAN SANJAY	23	5	4	5	4	5
S190962012	CHOUGULE PRIYANKA UTTAM	21	4	5	4	4	4
S190962013	DALAVI SAURABH SATYAVAN	22	4	5	4	4	5
S190962014	DESHMANE UTKARSH MADHAV	22	4	5	4	4	5
S190962015	DHANANJAY VISHNU TANGTODE	23	5	4	5	4	5
S190962016	DHARMADHIKARI ATHARV S	23	5	4	5	4	5
S190962017	DHAVALE JAYDIP MOHAN	23	5	4	5	4	5
S190962018	GAIKWAD ANAND ASHOK	21	4	5	4	4	4
S190962019	GARAD GAURAV ANAND	20	4	4	4	4	4
S190962020	GELYE OMKAR SUNIL	22	4	5	4	4	5
S190962021	GHULE ABHILESH DAGADU	22	4	5	4	4	5
S190962022	GOLE ATHARVA SATISH	20	4	4	4	4	4
S190962023	HINGMIRE SHIVALI ARUN	22	4	5	4	4	5

S190962024	HIVRALE ROHAN MACHHINDRA	21	4	5	4	4	4
S190962025	INGALE ROHIT KALIDAS	23	5	4	5	4	5
S190962026	ITHAPE RUTUJA SAMBHAJI	22	4	5	4	4	5
S190962027	JADHAV DIKSHA GULAB	21	4	5	4	4	4
S190962028	JADHAV OMKAR BHARAT	22	4	5	4	4	5
S190962029	JADHAV PRASAD RAJENDRA	20	4	4	4	4	4
S190962031	KAZI ARMAAN GOUSMOHIDDIN	23	5	4	5	4	5
S190962032	KHERDEKAR KSHITIJA P	22	4	5	4	4	5
S190962033	LOKHANDE SANDHYA SATISH	21	4	5	4	4	4
S190962034	MASARE SHAILESH SHAMRAO	20	4	4	4	4	4
S190962035	MORE PRATIK RAJESH	22	4	5	4	4	5
S190962036	MORE RUSHIKESH ANIL	22	4	5	4	4	5
S190962037	NAGARGOJE REVATA SHIVDAS	20	4	4	4	4	4
S190962038	NAIKADE OMKAR BALU	23	5	4	5	4	5
S190962039	NALDURGKAR AASHISH SUDHIR	20	4	4	4	4	4
S190962040	NIKALJE DIVYA POPAT	20	4	4	4	4	4
S190962041	NIKAM RAHUL RAJARAM	22	4	5	4	4	5
S190962042	PADGHANKAR KIRAN SUDHAKAR	21	4	5	4	4	4
S190962043	PALANGE PARTH MAHENDRA	22	4	5	4	4	5
S190962044	PANDIT PRASAD HIMMAT	22	4	5	4	4	5
S190962045	PATIL ABHISHEK ASHOK	21	4	5	4	4	4
S190962046	PATIL NIKHIL SANJAY	20	4	4	4	4	4
S190962047	PAWAR ROHAN DEEPAK	21	4	5	4	4	4
S190962048	PAWAR RUTURAJ SAMBHAJI	21	4	5	4	4	4
S190962050	PHADTARE AKASH SOPAN	21	4	5	4	4	4
S190962051	PRATHAMESH C PARMAR	23	5	4	5	4	5
S190962052	PUJARI GAYATRI PANDIT	21	4	5	4	4	4
S190962053	RAUT PRASHANT KADU	21	4	5	4	4	4
S190962054	RITESH RAJARAM MALI	20	4	4	4	4	4
S190962055	SABNE NARSING DILIP	21	4	5	4	4	4
S190962056	SANMANE SAURABH SIDDHARAM	21	4	5	4	4	4
S190962057	SARVADE HRUSHIKESH RAJESH	22	4	5	4	4	5

S190962058	SAVANT DIPALI PARMESHWAR	20	4	4	4	4	4
S190962059	SAWANT SARTHAK DATTATRAY	22	4	5	4	4	5
S190962060	SAYALI DNYANESHWAR KAMBLE	23	5	4	5	4	5
S190962061	SAYKAR ADESH RAMDAS	22	4	5	4	4	5
S190962062	SHAYAN ASIF SAYYAD	22	4	5	4	4	5
S190962063	SHELKE PRADIP NIVRUTTI	23	5	4	5	4	5
S190962064	SHETYE SATISH GAJANAN	22	4	5	4	4	5
S190962065	SHINDE ADESH SANJAY	21	4	5	4	4	4
S190962066	SHINKAR RUTUJA SUBHASH	22	4	5	4	4	5
S190962067	TAMBARE NANASAHEB BABAN	21	4	5	4	4	4
S190962068	THAKARE ANKUSH AMBADAS	21	4	5	4	4	4
S190962069	THORAT ABHIJEET RAJENDRA	18	4	3	4	3	4
S190962070	WAGHDHARE ATHARVA DILIP	22	4	5	4	4	5
S190962071	WAGHMARE VISHAL MUNJABHAU	23	5	4	5	4	5
S190962072	WANI HIMANSHU SANDESH	20	4	4	4	4	4
S190962073	ZENDE PRATIK RAVINDRA	22	4	5	4	4	5

Prof. Dr. Sujatha Rao
HOD

HOD
Dept. of AI & DS Engg.,
S.R.C.O.E., PUNE

SRES's

SHREE RAMCHANDRA COLLEGE OF ENGINEERING

Lonikand, Pune – 412216

Department of Mechanical Engineering

Unit Test No. 2

Class: TE (MECH) **Subject: Mechatronics(2019 Pattern)**

Date: /09/2022 **Max. Marks: 20**

Que. No. 1. What is signal communication? Enlist type of signal communication 05 Marks

OR

Que. No. 2. Explain parallel communication and its working principal 05 Marks

Que. No. 3 List the analog to digital converter and explain any one in detail 05 Marks

OR

Que. No. 4. Write comparison between different A/D converters 05 Marks

Que. No. 5. What is signal conditioning? 05 Marks

OR

Que. No. 6. Explain signal isolation? 05 Marks

Que. No. 5. Explain in brief. (Any 4) 05 Marks

a. DAQ in Household Application (Washing Machine System)
b. Digital Pressure Gauge
c. Digital Flow Measurement
d. Digital Video Broadcast (DVB)
e. Amplitude Modulation (AM)/ Frequency Modulation (FM)

SRES's

SHREE RAMCHANDRA COLLEGE OF ENGINEERING

Lonikand, Pune – 412216

Department of Mechanical Engineering

Unit Test No. 2

Class: TE (MECH) **Subject: Mechatronics(2019 Pattern)**

Date: /09/2022 **Max. Marks: 20**

Que. No. 1. What is signal communication? Enlist type of signal communication 05 Marks

OR

Que. No. 2. Explain parallel communication and its working principal 05 Marks

Que. No. 3 List the analog to digital converter and explain any one in detail 05 Marks

OR

Que. No. 4. Write comparison between different A/D converters 05 Marks

Que. No. 5. What is signal conditioning? 05 Marks

OR

Que. No. 6. Explain signal isolation? 05 Marks

Que. No. 5. Explain in brief. (Any 4) 05 Marks

a. DAQ in Household Application (Washing Machine System)
b. Digital Pressure Gauge
c. Digital Flow Measurement
d. Digital Video Broadcast (DVB)
e. Amplitude Modulation (AM)/ Frequency Modulation (FM)

Shree Ramchandra College of Engineering Pune

SRES's

SHREE RAMCHANDRA COLLEGE OF ENGINEERING

Lonikand, Pune – 412216

Department of Mechanical Engineering

Unit Test No. 1

Class: TE (MECH) **Subject: Mechatronics(2019 Pattern)**

Date: /08/2022 **Max. Marks: 20**

Que. No. 1. Define mechatronics. Give an overview of mechatronics discipline. 05 Marks

OR

Que. No. 2. What is the difference between sensor and transducer? 05 Marks

Que. No. 3. What are the basic characteristics of a measuring device? 05 Marks

OR

Que. No. 4. Write a short note on selection criteria of sensors. 05 Marks

Que. No. 5. Enlist types of strain gauges and explain it in detail. 05 Marks

OR

Que. No. 6. How strain gauge is measured? 05 Marks

Que. No. 5. Write the difference between load cell and strain gauge. 05 Marks

OR

Que. No. 6. List types of flow sensor. 05 Marks

SRES's

SHREE RAMCHANDRA COLLEGE OF ENGINEERING

Lonikand, Pune – 412216

Department of Mechanical Engineering

Unit Test No. 1

Class: TE (MECH) **Subject: Mechatronics(2019 Pattern)**

Date: /08/2022 **Max. Marks: 20**

Que. No. 1. Define mechatronics. Give an overview of mechatronics discipline. 05 Marks

OR

Que. No. 2. What is the difference between sensor and transducer? 05 Marks

Que. No. 3. What are the basic characteristics of a measuring device? 05 Marks

OR

Que. No. 4. Write a short note on selection criteria of sensors. 05 Marks

Que. No. 5. Enlist types of strain gauges and explain it in detail. 05 Marks

OR

Que. No. 6. How strain gauge is measured? 05 Marks

Que. No. 5. Write the difference between load cell and strain gauge. 05 Marks

OR

Que. No. 6. List types of flow sensor. 05 Marks

823/07.09.18/10 lacs/402/A4/4 pages/2018-19

SAVITRIBAI PHULE PUNE UNIVERSITY

Verified all entries & found correct

Jr. Supervisor's Name, Singature & Date

PDQ

PRACTICAL EXAMINATION IN Oct - Nov 2022

AT THE SRCOE EXAMINATION

CANDIDATE'S SEAT No. (In figures) S190962520 SECTION.....

CANDIDATE'S SEAT No. (In words) .....

INSTRUCTIONS TO CANDIDATES

1. Read the question carefully and perform the experiment as required.
2. If there be anything in the apparatus that you do not know, ask the examiner or the laboratory assistance to help you.
3. Before doing any electrical experiment, it is absolutely essential that you make a neat working sketch of all apparatus actually provided and of the necessary connection, and obtain the examiner's permission to proceed.
4. Express all observations in a tabular form.
   It is also desirable that all intermediate calculations and results should be entered as neatly and clearly as possible.
5. No numerical figures should be written over either in the preliminary or final observations. If any figure is sought to be discarded it should be run through and the desired figure written near to it.
6. Please see that your table is in good order before you leave the laboratory.

(Begin writing here)

Aim :- Study of op-amp as ZCD, comparator & schmitt trigger.

Apparatus :-

1) DC regulated power supply.
2) C.R.O.
3) function generator.
4) comparator, ZCD & schmitt trigger.
5) Digital Multi Meter.

Circuit Diagram.

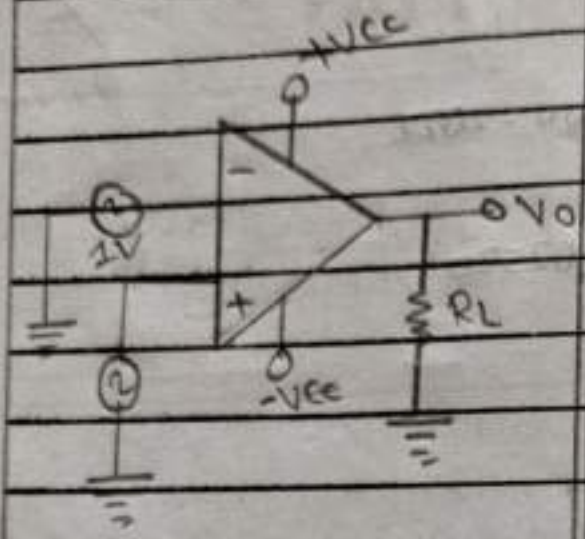


fig- comparator.

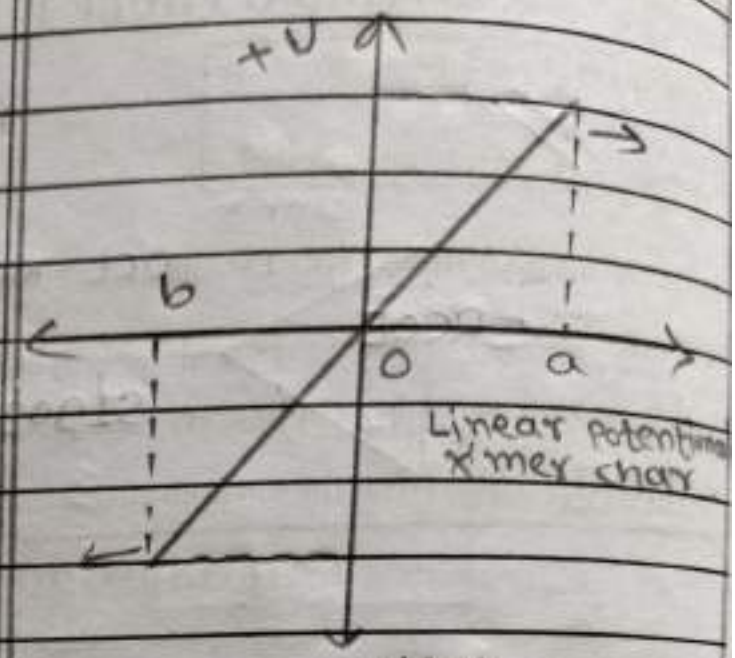
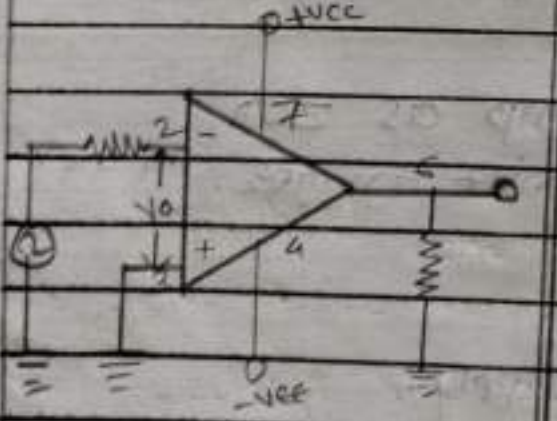
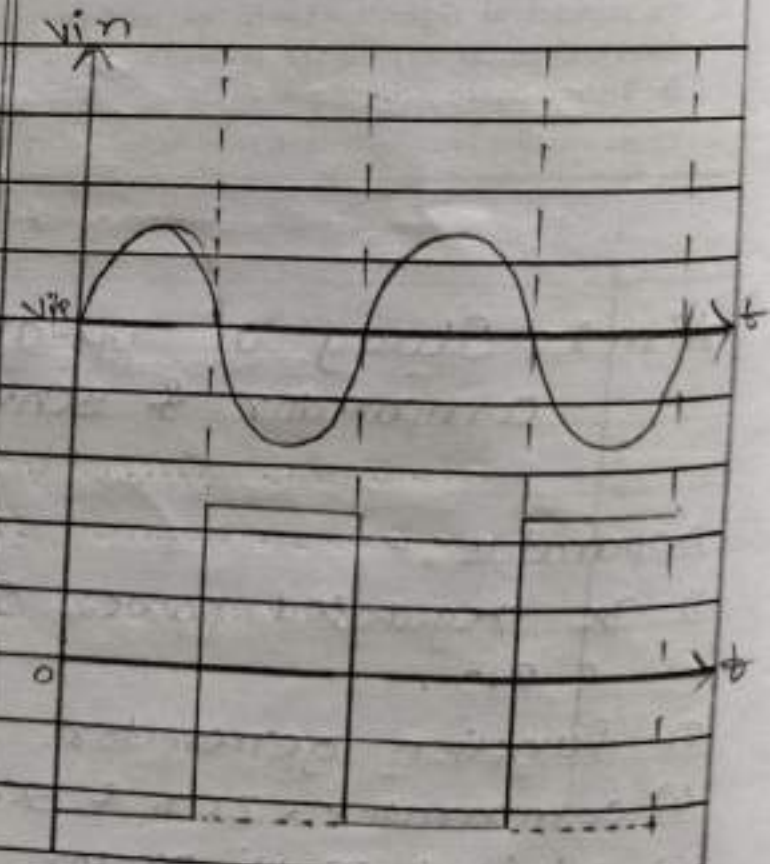


fig - Transfer char comparator



zero crossing detector



Ilp & olp waveform.

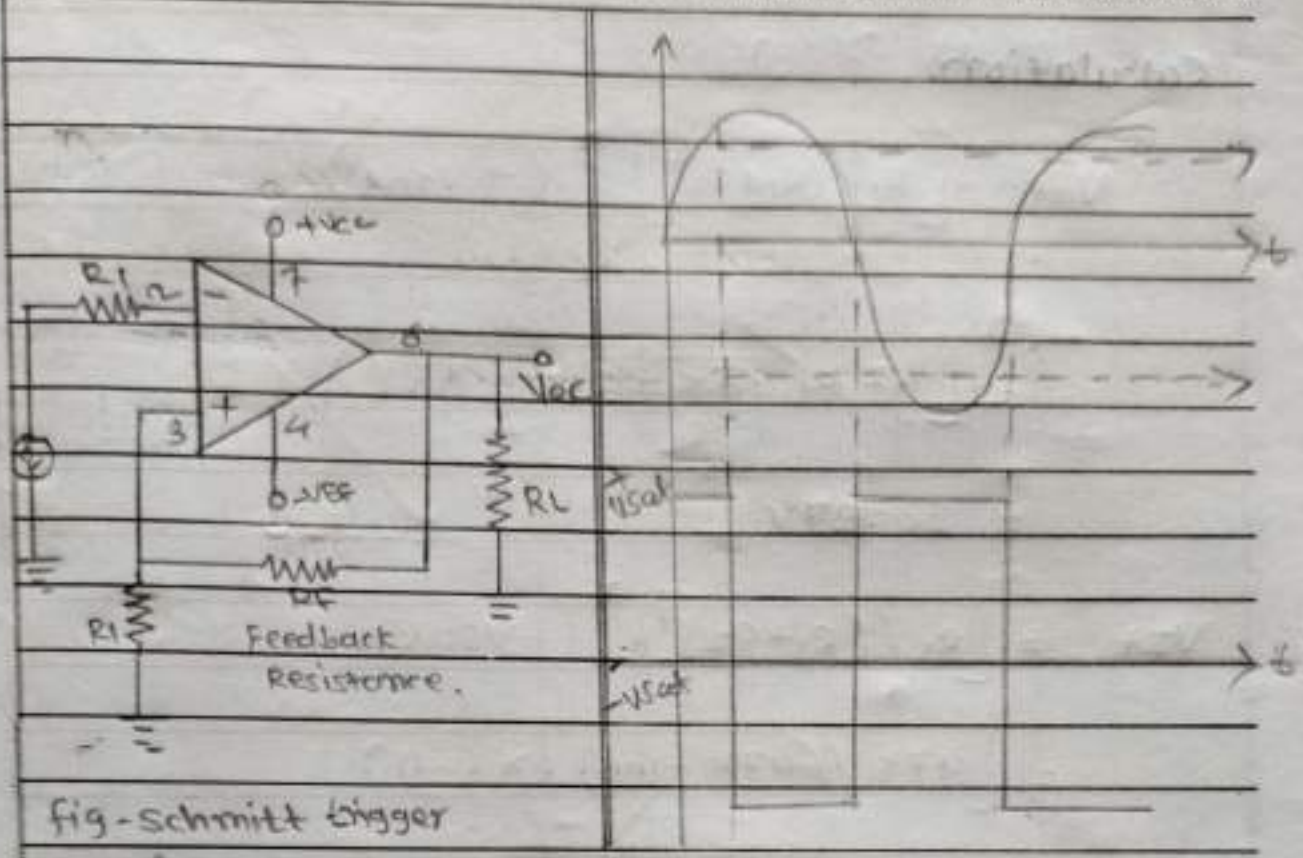


fig - Schmitt trigger

Component value Table.

Sr. No.	Name of component	Value	Unit.
1)	Vin :- Alternating I/p voltage	2	V
2)	Vref :- Reference voltage.	0.5	V
3)	R_1 :- Biasing Resistor.	47	Ω
4)	R_2 = Biasing	100	KΩ
5)	+Vcc	+12	V
6)	-VEE.	-12	V

RL

Calculation.

$$V_{ut} = \left[R_1/(R_1+R_2)\right] * (+V_{sat})$$

$$= \left[47k/(47k+100)\right] \times (11)$$

$$= 10.97V$$

$$V_{It} = \left[R_1/(R_1+R_2)\right] * (-V_{sat})$$

$$= \left[47k/(47k+100)\right] \times (-11)$$

$$= 10.97V$$

$$V_{hy} = V_{ut} - V_{It}$$
$$= 10.97 + 10.97$$
$$= 21.95$$

Conclusion.

We studied the op-amp as zero cross detector schmitt trigger, comparator and output & Input waveform.

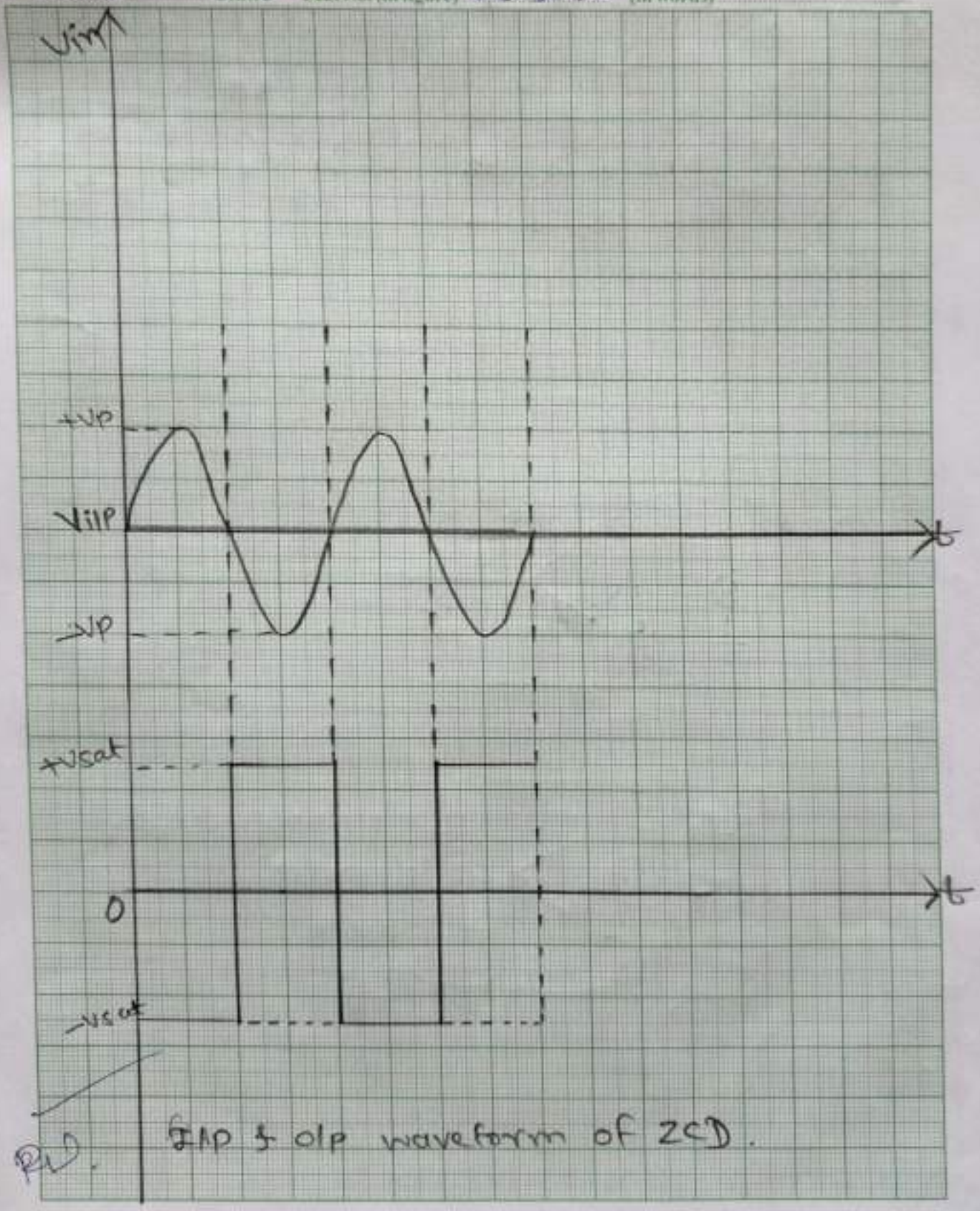
SAVITRIBAI PHULE PUNE UNIVERSITY

Signature of the Junior Supervisor (with Date)

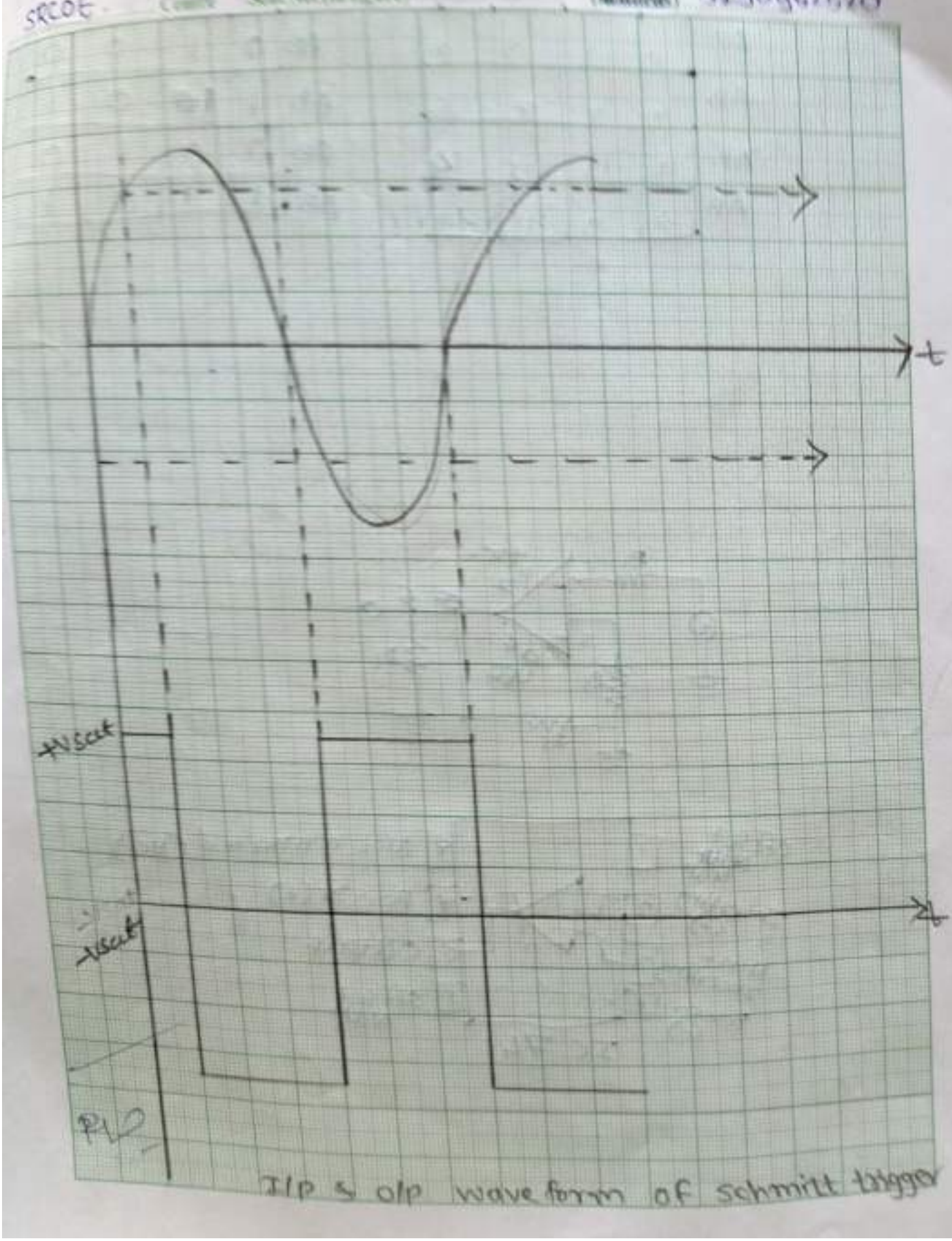
Q. No. .....

..... Examination

SRCOE ..... Centre Seat No. (in figure) S190950520 (in words) .....



RD. I/P & o/p waveform of ZCD.



25/11.09.17/15 lacs/224/A/A4/4 pages/2017-18

M.TL.

SAVITRIBAI PHULE PUNE UNIVERSITY

Verified all entries & Found correct
Jr. Supervisor' Name, Singature & Date

PCS

PRACTICAL EXAMINATION IN End sem- power system-II

AT THE SRCOE EXAMINATION

CANDIDATE'S SEAT NO. (In figures) T190962523 SECTION

CANDIDATE'S SEAT NO. (In words) T one nine zero nine six two five two three.

INSTRUCTIONS TO CANDIDATES

1. Read the question carefully and perform the experiment as required.
2. If there be anything in the apparatus that you do not know, ask the examiner or the laboratory assistance to help you.
3. Before doing any electrical experiment, it is absolutely essential that you make a neat working sketch of all apparatus actually provided and of the necessary connection, and obtain the examiner's permission to proceed.
4. Express all observations in a tabular form.
   It is also desirable that all intermediate calculations and results should be entered as neatly and clearly as possible.
5. No numerical figures should be written over either in the preliminary or final observations. If any figure is sought to be discarder if should be run throungh and the desired figure written near to it.
6. Please see that your table is in good order before you leave the laboratory.

(Begin writing here)

Aim :- measurement of ABCD parameter of a medium transmission line

Apparatus :-

SR	Name of Equipment	Range	Quantity
1	medium trans. line	pie model	1
2	Ammeter	0-1A	2
3	voltmeter	0-230V	2
4	wattmeter	300V-1A	1
5	connecting wires	-	-

*circuit diagram

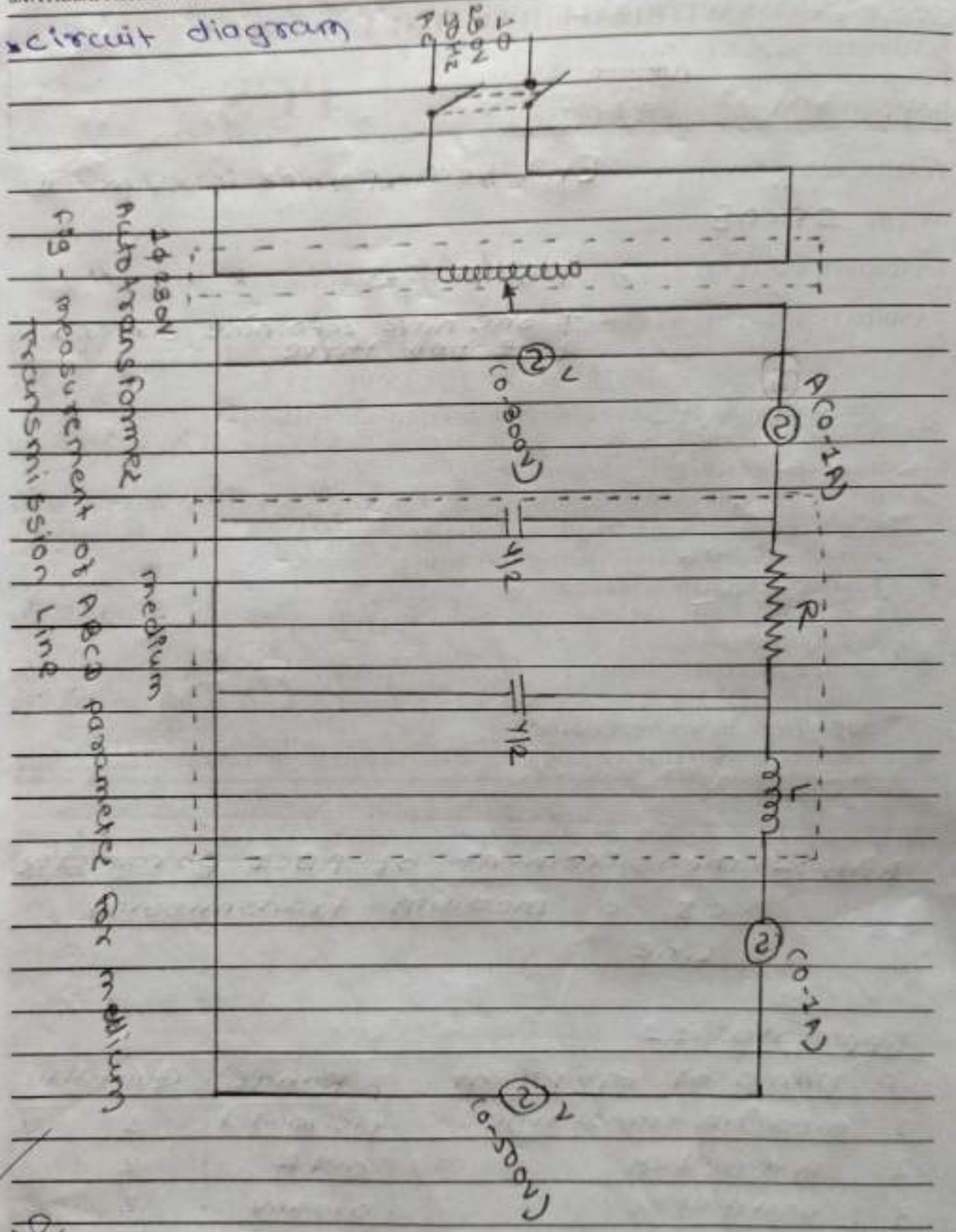


Fig - Measurement of ABCD parameters for medium Transmission Line medium

RD.

Observation Table

SR	Input	case	VS (V)	IS (A)	VR (V)	IR A)
1	Sending end	Receiving end open	218	0.092	218	0
2	Sending end	Receiving short	51	4.045	0	4.043
3	Receiving end	sending opn	220	0	220	0.078
4	Receiving end	sending end	0	1.495	220	1.418

Calculation :-

R = 4Ω

L = 110mH

C = 0.047 μF

F = 50 Hz

practically,

VS = AVR + BIR

IS = CVR + DIR

1) $A \left.\frac{V_S}{V_R}\right|_{I_R=0} = \left.\frac{218}{218}\right|_{I_R=0}$ A = 1

2) $B \left.\frac{V_S}{I_R}\right|_{V_R=0} = \left.\frac{51}{4.045}\right|_{V_R=0}$ B = 12.61Ω

3) $C \left.\frac{I_S}{V_R}\right|_{I_R=0} = \left.\frac{0.078}{220}\right|_{I_R=0}$ C = 3.54 X 10^{-4} Ω

4) $D \left.\frac{V_S}{I_R}\right|_{V_R=0} = \left.\frac{1.418}{1.495}\right|_{V_R=0}$ D = 1.054

$V_S = AV_R + BI_R$

$I_S = CV_R + DI_R$

We derive the parameter of medium transmission line as

$$A = \left[\frac{Y}{2} \quad Z+1\right]$$

$$B = Z$$

$$C = Y\left[\frac{Y}{4} Z+1\right]$$

$$D = \left[\frac{Y}{2} \quad Z+1\right]$$

Result :-

SR	parameter	Theoritical value	practical value
1	A	$1<-0.016$	1
2	B	$347 \angle 83.39\,\Omega$	$12.61\,\Omega$
3	C	$1.16\times10^{-8} \angle 89\,\Omega$	$2.54\times10^{-4}\,\Omega$
4	D	$1<0.016$	1

Conclusion - Thus we have studied ABCD parameter of medium transmission line.

PL2

SRES's

SHREE RAMCHANDRA COLLEGE OFENGINEERING

Lonikand, Pune – 412216

Department of Mechanical Engineering

Termwork Assessment sheet

lass: BE **Sem: VII** **Subject : Data Analytics Laboratory (50 Marks)** **A.Y: 2022-2023**

Exam Seat No.	Name of Student	Submission(10)	Assessment Regularity (10)	Practical Performance (10)	Practical Attendance(10)	Theory Attendance (10)	Total (50)
B190960801	AJINKYA BAJRANG PATIL	8	7	9	8	9	41
B190960802	ASHUTOSH SAHOO	9	9	9	8	9	44
B190960803	BAHIRAT SHUBHAM VIJAY	7	8	8	8	8	39
B190960805	BHAIRAVKAR SAURABH PRAVIN	6	8	9	9	7	39
B190960806	BURKUNDE AJAY SHIVRUDRA	6	7	8	8	9	38
B190960807	CHAVAN VIJAY BALASAHEB	8	8	7	9	8	40
B190960808	DEVGAONKAR KIRAN MANIKRAO	9	9	8	8	8	42
B190960809	DHIWAR RUSHIKESH PRAMOD	9	8	9	9	9	44
B190960810	DHOLE ROSHAN RAKHAMAJI	9	7	8	8	7	39
B190960811	DHUMAL TRUPTI TATYASO	8	9	8	8	9	42
B190960812	GAIKWAD SWAPNIL SHIVAJI	5	7	8	8	9	37
B190960813	GHANVAT JIVAN RAMDAS	7	7	7	7	8	36
B190960814	GODSE TEJAL GOVIND	8	8	9	9	9	43
B190960815	HOGADE SHIVANAND DHANRAJ	9	9	8	8	8	42
B190960816	INGALE SHUBHAM GOPAL	6	8	7	9	9	39
B190960817	INGOLE SUGAT VISHWANATH	0	6	5	4	6	21
B190960818	JEDHE ABHISHEK SOMNATH	7	9	9	7	8	40
B190960819	JEDHE RAJLAKSHMI ANIL	9	9	8	9	9	44
B190960820	KADAM VISHAL MANOHAR	0	3	6	5	5	19
B190960821	KALE GAURAV ANIL	9	9	8	9	9	44
B190960822	KHAIRE SANKET SUBHASH	8	7	8	8	7	38
B190960823	KHARWADE RAHUL BHAUSAHEB	9	7	8	7	8	39
B190960824	KULDHARME JAYANT UTTAM	9	9	9	8	9	44
B190960825	KUNALE KULDIP UTTAM	8	9	8	7	8	40

Shree Ramchandra College of Engineering Pune

B190960826	MANE RISHIKESH BHARAT	9	9	7	8	9	42
B190960827	MEMANE ANIKET BHANUDAS	0	5	4	6	5	20
B190960828	MISAL SONALI ANKUSH	8	7	7	7	7	36
B190960829	MISTARY HARSHAL AJAY	7	7	8	7	9	38
B190960830	MORE SHIVDEEP VILAS	8	6	9	8	8	39
B190960831	MUDHOL KIRAN VITTHALRAO	0	6	5	4	5	20
B190960832	NIKAM SHYAMSUNDAR ASHOK	8	8	7	8	8	39
B190960833	NITESH KUMAR	9	7	8	8	8	40
B190960834	PATIL DURGESH ANIL	7	6	7	8	7	35
B190960835	PATIL ROHIT RAJENDRA	7	7	8	9	8	39
B190960837	RANE PRANEET VIJAY	8	7	8	7	8	38
B190960838	ROLE AKASH ANKUSH	9	8	8	8	7	40
B190960839	SAKUNDE PRIYANKA VINAYAK	9	9	7	7	8	40
B190960840	SATHE PRITAM RAMESH	7	8	8	8	8	39
B190960841	SHEVALE SHIVRAJ ARJUN	0	6	5	4	4	19
B190960843	SHINDE HARSHAD SANJAY	8	7	7	9	9	40
B190960844	SHINDE OMKAR VIJAY	8	8	9	8	8	41
B190960845	SHINDE SACHIN TANAJI	8	9	8	7	9	41
B190960846	SHUBHAM BALASO KONDE	0	6	4	5	4	19
B190960847	SURYAWANSHI SURAJ NAGNATH	0	4	5	4	3	16
B190960848	SUSMITA GAJANAN MANE	7	7	8	8	8	38
B190960849	THORAT PRASHANT MAHADEV	8	8	8	8	7	39
B190960850	THORAT SANDESH PANDURANG	7	7	7	8	8	37
B190960851	UGALE DINESH ANNA	8	7	8	8	9	40
B190960852	UMESH SUBHASH SHINDE	9	8	7	9	8	41
B190960853	VAIBHAV VILAS LADEKAR	8	8	9	8	9	42
B190960854	VIJAPURE PRAFULL SIDHARAM	8	9	8	9	9	43
B190960855	VISHAL SANJAY THETE	9	8	9	8	8	42
B190960856	WADIKAR NILESH PARMANAND	8	9	8	8	8	41
B190960857	WAGHMARE ADITYA VITTHAL	8	8	9	8	7	40
B190960858	YEDE AKASH ASHOK	7	6	8	8	8	37

Prof. A.B. Bhave
Subject Teacher

Prof. M.K. Jadhav
H.O.D

Sinhgad Institutes
Late Ramchandra College of Engineering
Pune

Savitribai Phule Pune University

UG CHOICE BASED CREDIT SYSTEM

RULES AND REGULATIONS

Extract from Affiliating University Web site Course structure, Evaluation Scheme for C.B.C. System.

FOR

UNDER GRADUATE ROGRAMME IN ENGINEERING

UNDER

FACULTY OF SCIENCE AND TECHNOLOGY

WITH EFFECTIVE FROM A.Y. 2019-20

Shree Ramchandra College of Engineering * Pune

Principal
Shree Ramchandra Education Society's
Shree Ramchndra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

Course Structure, Guidelines, Rules and Regulations

Preamble

Economic progress of country is strongly linked with quality of technical education. Engineering education is gaining new heights and it contributes substantial share in overall education system. Engineering graduates are to be educated and trained with a view of employability and sustainability. With the advent of technology and ever-changing expectations from the Industry and Society, revision of curriculum is need of the day, making it contemporary and relevant. In a bid to fine tune our technical education system to the global standards & practices, the Credit-Grade based performance and assessment system has been already implemented with effect from June 2015 onwards for all the Under Graduate Programme (UG) under the Faculty of Science & Technology.

To fulfill the necessities, the youngsters pursuing engineering studies need to be well equipped and acquaint with the latest technological trends and industrial requirements. This is possible only when the students undergo studies with an updated and evolving curriculum to match global scenario. The faculty of Science & Technology has shouldered the idea of incorporating latest advances and to upgrade the course contents with latest and relevant topics and know-how. Accordingly the new structure and curriculum are being introduced to be implemented from the academic year 2019-20 for First Year Engineering and the process will continue for subsequent years for second, third and fourth year engineering.

General Guidelines

1. All undergraduate programmes in Engineering under faculty of Science & Technology will be of **four years** duration and **eight semesters**.
2. The total number of credits required to earn for the **completion of the programme is 170 credits** in a minimum period of **eight semesters**.
3. All UG programme, under Faculty of Science & Technology shall be offered with **170 credit**; one credit is approximately equivalent to 15 contact hours.
4. Assessments in Choice based Credit System consists of
   A) In-semester examination
   B) End-semester examination
   C) Continuous assessment for various examination heads.
   Assessment and Evaluation is to be done as per guidelines provided by competent authority.
5. Semester 1 and semester 2 will be part of First Year of Engineering (FE),
   Semester 3 and semester 4 will be part of Second Year of Engineering (SE),
   Semester 5 and semester 6 will be part of Third Year of Engineering (TE),
   Semester 7 and semester 8 will be part of Final Year of Engineering (BE)
6. **Induction Program**

   Induction programme for first year students is introduced to familiarize them to the new environment and encourage them to learn beyond classrooms. Objective is to help new students adjust and feel comfortable in the new environment, inculcate in them the ethos and culture of the institution, help them build bonds with other students and faculty members, and expose them to a sense of larger purpose and self exploration. Induction Program should be preferably of 3 weeks **(2 weeks at beginning first semester and 1 week at the beginning of second semester)**. In order to implement the (SIP) in the College the following activities can be taken at College.

   - Physical Activity: - This would involve a daily routine of physical activity with games and sports.
   - Creative Arts: - Every students would chose one skill related to arts whether visual arts or performing arts.
   - Mentoring and Universal Human values:-Mentoring and connecting the students with faculty members and other students is the most important part of student induction. This can be effectively done by forming a group of 22-24 students with a

Shree Ramchandra College of Engineering Pune

Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

faculty mentor each. This can be implemented through group discussion and real life activities rather than only lecturing.

- Familiarization with College, Department and Branch :-The incoming student should be told about the credit, grading system and scheme of the examination. They should be explained how the study in College differs from the study in school. They should be taken on College tour and shown important facilities such as library, canteen, gymkhana etc. They should be shown their own department.
- Literary Activity:-Literary Activity would compass reading book, writing a summary, debating, enacting a play etc.
- Proficiency modules: - The modules can be designed to overcome some critical lacunas that students might have like English Speaking, Computer familiarity etc.
- Lectures by Eminent People: - The lectures of Eminent people be organized to expose the students to social activity and public life.
- Visit to local Area:-A couple of visits to the landmarks of the city or a hospital are orphanage could be organized.
- Extracurricular activities in College:-The new students should be introduced to the extracurricular activities at the College.
- Feedback and Report on the program:-Students should be asked to give their mid program Feedback wherein each group of 22-24 students should be asked to prepare a single report on their experience of the program.

To summarize the above activity the sequence of activities can be planned as given below:

- Address by Principal, HOD's and other functionaries and welcome the new students along with their parents.
- The branch wise allocation of students to be done and a group of 22-24 students is to be formed along with one faculty as mentor.
- A detail time table of various activities is to be prepared and displayed for all students. The timetable should give details of location and details of faculty in charge of the activity.
- The visit to local areas can be arranged on Saturdays.
- The various activities to be carried out can be divided into three phases :-
  1. Initial phase:- Which may include Address by Principal, HOD's and other functionaries College and Dept Visit, interaction with parents Forming of students group and assigning of mentor mentee.
  2. Regular Phase:- This phase may include the activities such as creative arts / universal Human values Games & Sports in the morning session and in the afternoon session. Literary activities, Proficiency module, Lectures & workshop, Extracurricular Activities etc. can be scheduled.
  3. Closing Phase:- This phase may include taking feedback of students, preparation of Report by each group, Test of creative Arts, Human Values can be taken.

These are summarized guidelines to be given to the student inducing induction programme (SIP). Please refer SIP Manual published by AICTE for detail guidelines[2].

7. **Project based Learning:**

For better learning experience, along with traditional classroom teaching and laboratory work based learning, project based learning has been introduced with an objective to motivate students to learn by working in groups **(5 to 6 students per group)** courteously to

Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

solve a problem. Students may undertake a problem which can be theoretical, practical, social, technical, symbolic, cultural and/or scientific and grows out of students' wondering within different disciplines and professional environments. A chosen problem has to be **exemplary**. The problem may involve an interdisciplinary approach in both the analysis and solving phases. Such practice will also increase their capacity and learning through shared cognition. [3] [5].

8. **Laboratory Course:**
   The laboratory work will be based on completion of experiments/ lab assignments confined to the related companion courses of the semester.
9. **Seminar:**
   Seminar shall be on state-of-the-art topic selected by student and approved by the authority. The student shall submit the duly certified seminar report in standard format, for satisfactory completion of the work by the concerned Guide and head of the department/institute.
10. **Project Work at Final Year:**
    Project work in the seventh semester is an integral part of the project work. The project work shall be based on the knowledge acquired by the student during the graduation and preferably it should meet and contribute towards the needs of the society. The project aims to provide an opportunity of designing and building complete system or subsystems based on area where the student likes to acquire specialized skills. The student shall prepare the duly certified final report of project work in standard format for satisfactory completion of the work by the concerned guide and head of the Department/Institute.
11. **Internship**
    Internships are educational and career development opportunities, providing practical experience in a field or discipline. Internships are far more important as employers are looking for employees who are properly skilled. They are structured, short-term, supervised placements often focused around particular tasks or projects with defined time scales. Core objective is to expose technical students to the industrial environment, which cannot be simulated/experienced in the classroom and hence creating competent professionals in the industry and to understand the social, economic and administrative considerations that influence the working environment of industrial organizations. Student may choose to undergo Internship at Industry/Govt./NGO/MSME/Rural Internship/ Innovation/ IPR/Entrepreneurship. Student may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/NGO's/Government organizations/Micro/Small/ Medium enterprises to make themselves ready for the industry [4]. Conduction, monitoring, assessment, and evaluation is to be done as per guidelines provided by AICTE [4].
12. **Abbreviations:**
    TW: Term Work **TH:** Theory **OR:** Oral **TUT**: Tutorial **PR**: Practical
    Sem: Semester, **PROJ**: Project Work, **ESE**: End Semester Examination **ISE**: In Semester Examination, CA: Continuous Assessment, **DW:** Drawing.

Definition of Credit [1]:**

1 Hour Lecture (L) per week	1 credit for 1 Hour
Tutorial (T) per week	1 credit for 1 Hour
Practical (P) per week 2 Hours Practical(Lab)/week	1 credit for 2 Hours

** The head of Tutorial and Practical (as a special case) may be merged for common credit with the permission of authority.

Shree Ramchandra College of Engineering Pune

Principal
Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

This document includes following sections-

I. Undergraduate Engineering Programme Structure
II. Examination Scheme
III. Structure of Question Paper
IV. Assessment
V. Rules of Passing
VI. Rules of ATKT (Allowed To Keep Term)
VII. Assessment and Grade Point Average
VIII. Performance Indices
IX. Result
References

1) UG Programme Structure and Credit Distribution:

Each B.E. / B. Tech. programme is of 4 years duration. The minimum total number of credit requirement for each programme is 170. In the structure, the credits are distributed over 8 semesters. The open elective included, gives the student a wide choice of subjects from other programme. The Credit structure for Bachelor of Engineering programme is given below in Table 1.

TABLE 1: Credit Structure for UG programme in Engineering

Credits offered									
Course Work	Semester								Total
	I	II	III	IV	V	VI	VII	VIII	
Professional Theory Courses *	17	16	15	15	12	06	06	06	90
Elective Courses^	-	-	-	-	03	03	06	06	18
Laboratory Courses/ continuous assessment/TW	05	04	07	05	05	05	06	02	42
Seminar &Communication Skills	-	-	-		01	01		-	02
Project Work	-	-	-	-	-	02	02	06	10
Project Based Learning		02		02	--	--	--	--	04
Internship$	--	--	--	--		04	--	--	04
Total	22	22	22	22	21	21	20	20	170
Mandatory Non_Credit_Graded_Audit Course# per semester									
Induction Program at first year Engineering	3 week duration (2 week at the beginning of Sem-I & 1 week at the beginning of Sem-II)								

*: Professional Courses include - Engineering Science Courses including Workshop, Drawing, basics of Electrical/Electronics/Mechanical/Computer/Civil Engineering, Humanities and Social Sciences including Management/Finance Management courses, Basic Science courses and Professional core courses.

^: Professional Elective courses relevant to chosen specialization/branch and Open Electives (interdisciplinary and /or emerging technology)

#: There will be mandatory **Non_Credit Course** per Semester viz- Environmental Studies, Indian Constitution, Essence of Indian Traditional Knowledge, financial Management and courses introduced time to time by university or apex bodies.

$: Internship to be completed after semester 5 and to be assessed in semester 6. Internship will be of 4 to 6 weeks maximum.

Shree Ramchandra College of Engineering Pune

Principal
Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

TABLE -2 First Engineering _Structure for Semester-I

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107001	Engineering Mathematics-I	03	--	01	30	70	25	--	--	125	03	--	01	04
107002/ 107009	Engineering Physics / Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
102003	Systems in Mechanical Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
111006	Workshop[@]	--	02	--	--	--	--	25	--	25	--	01	--	01
	Total	16	10	01	150	350	25	125	--	650	16	05	01	22
101007	Audit Course 1[&]	02	Environmental Studies-I											

Induction Program : 2 weeks at the beginning of semester-I and 1 week at the beginning of semester-II

TABLE -3 First Engineering_ Structure for Semester-II

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107008	Engineering Mathematics-II	04	--	01	30	70	25	--	--	125	04	--	01	05
107002/ 107009	Engineering Physics/ Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
102012	Engineering Graphics[!]	01	02	01	--	50	25		--	75	01	01		02
110013	Project Based Learning[§]	--	04	--	--	--	25	50	--	75	--	02	--	02
	Total	15	12	02	120	330	75	125	--	650	15	05	02	22
101014	Audit Course 2[&]	02	Environmental Studies-II											
107015		--	Physical Education-Exercise and Field Activities											

Shree Ramchandra College of Engineering Pune

Principal
Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Ramnagar Road, Lonikand, Pune-412216

Instructions:

- PR/Tutorial must be conducted in three batches per division.
- Minimum number of required Experiments/Assignments in PR/ Tutorial shall be carried out as mentioned in the syllabi of respective subjects.
- Every Student should appear for Engineering Physics, Engineering Chemistry, Engineering Mechanics, Basic Electrical Engineering, Basic Electronics Engineering, Programming and Problem solving during the year.
- College is allowed to distribute Teaching workload of subjects Engineering Physics, Engineering Chemistry, Basic Electrical Engineering, Basic Electronics Engineering, Engineering Mechanics, Programming and Problem solving in semester I and II dividing number of FE divisions into two appropriate groups.
- Assessment of tutorial work has to be carried out as term-work examination. Term-work Examination and Practical Examination at first year of engineering course **shall be internal continuous assessment only.**

Ω 1 Credit for Engineering Graphics theory has to be awarded on the basis of End semester examination of 50 marks while 1 credit of tutorial and practical **shall be awarded on internal continuous assessment only.**

@ Credit for the course of workshop practical is to be awarded on the basis of continuous assessment / submission of job work.

§ Project based learning (PBL) requires continuous mentoring by faculty throughout the semester for successful completion of the tasks selected by the students per batch. While assigning the teaching workload a load of 2 Hrs/week/batch needs to be considered for the faculty involved. The Batch needs to be divided into sub-groups of 5 to 6 students. Assignments / activities / models/ projects etc. under project based learning is carried throughout semester and Credit for PBL has to be awarded on the basis of internal continuous assessment and evaluation at the end of semester.

& Audit course for Environmental Studies and II (As per D.O.No.F.13-1/2000 (EA/ENV/COS-I) dated 14 May, 2019) is mandatory but non-credit course. Examination has to be conducted at the end of Sem I & II respectively for award of grade at college level. Grade awarded for audit course shall not be calculated for grade point &CGPA.

Audit course for Physical education is mandatory non-credit course. Examination has to be conducted at the end of Semester for award of grade at college level. Grade awarded for audit course shall not be calculated for grade point &CGPA.

TABLE -4 Structure for Semester-III

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	15	150	350			15
PR/OR/Tut	14			100	100	07
Total	29	150	350	100	100	22

TABLE -5 Structure for Semester-IV

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	15	150	350			15
PR/OR/Tut	10			100	50	05
Project based learning	04				50	02
Total	29	150	350	100	100	22

Principal

Shree Ramchandra Education Society's
Shree Ramchndra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

TABLE -6 Structure for Semester-V

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	15	150	350			15
PR/OR/Tut	10			100	50	05
Seminar	01				50	01
Total	26	150	350	100	100	21

TABLE -7 Structure for Semester-VI

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	12	120	280			12
PR/OR/Tut	10			100	100	05
Internship	04				100	04
Total	26	120	280	100	200	21

TABLE -8 Structure for Semester-VII

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	**TW Marks**	Credits
Theory	12	120	280			12
PR/OR/Tut	08			100	50	04
Moocs etc.					50	02
Project Stage-1	04			50	50	02
Total	24	120	280	150	150	20
Credits of MOOCs Courses shall be awarded based on completion of relevant course (recommended by college / University) of equivalent or more credits and submission of Certificate to college. College shall submit the same to university through online process to be followed in due course.						

TABLE -9 Structure for Semester-VIII

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	12	120	280			12
PR/OR/Tut	04			100	50	02
Project Stage-2	12			50	100	06
Total	28	120	280	150	150	20

Note: Any Course offered (Semester-III to Semester-VIII) should be of minimum 2 credits.

2. Examination Scheme:

R.21

The theory examination shall be conducted in two phases for all the subjects of semester-I to semester-VIII.

R2.1.1: Phases of Examination

Phase I as In-Semester Examination of 30 marks written theory examination based on Unit-1 and Unit-2 of course syllabus scheduled by univ[illegible]

Shree Ramchandra College of Engineering Pune

Principal
Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

Phase II as End-Semester Examination of 70 marks written theory examination based on unit number 3, 4, 5, 6 of course syllabus scheduled by university.

3. Structure of Question Paper:

R3.1 Two units (Unit1 and Unit 2) will be covered for 30 Marks for Phase 1 (ISE). Equal weightage will be given to both the units (15 Marks each)

R3.2 Four units (Unit 3, Unit 4, Unit 5 and Unit 6) shall have weightage of 70 Marks for Phase 2 (ESE). Marks weightage for the unit 3, unit 4, unit 5 and unit 6 shall be as shown in Table no.10

- Marks weightage to be given for questions per unit is as –

TABLE -10. Marks weightage per unit for examination

Unit Number	Phase I ISE Marks Weightage	Phase II ESE Marks Weightage
1	15	--
2	15	--
3		18
4	-	17
5	--	18
6	-	17

R3.3 Paper will have only one section and two questions for ISE and four questions for ESE. For each question there will be alternate Question based on same unit and of the same marks.

R3.4 Framing of questions should be according to Anderson/Blooms Taxonomy and disseminated through the question papers with a mention of course outcomes as well.

4. Assessment

A. Theory:

R4.1

ISE assessment will be done at the centralized assessment programme (CAP) Centre of the College by the Expert who is appointed as an examiner for the courses as per 48(3) panel of Maharashtra public university act 2016.

R4.2

ESE assessment will be done at the CAP Centre designated by the University by the Expert who is appointed as an examiner for the subject as per 48(3) panel.

B. Term work:

R4.3

Term Work assessment shall be conducted for the Lab Practice, Project, Tutorials and Seminar. Term work is continuous assessment based on work done, submission of work in the form of report/journal, timely completion, attendance, and understanding. It should be assessed by subject teacher of the institute for first to sixth semester and by the external examiner at seventh and eighth semester. At the end of the semester, the final grade for a Term Work shall be assigned based on the performance of the student and is to be submitted to the Savitribai Phule Pune University (SPPU). A student who fails in the Term Work on account of unsatisfactory performance shall be given F grade and on the account of inadequate attendance shall be given FX grade. Failing in a particular course Term Work shall not be the criteria for detention in the semester.

C. Practical/Oral/Presentation:

R.4.5

Practical/Oral/presentation is to be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at

Principal
Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

least one pair of examiners appointed as examiners by the Savitribai Phule Pune University. The examiners will prepare the mark / grade sheet in the format as specified by the Savitribai Phule Pune University and authenticate it.

D. Project Based Learning

R4.6

It is recommended that the all activities are to be record and regularly, regular assessment of work to be done and proper documents are to be maintained at college end by both students as well as mentor (you may call it PBL work book). Continuous Assessment Sheet (CAS) is to be maintained by all mentors/department and institutes.

Recommended parameters for assessment, evaluation and weightage:

- Idea Inception **(5%)**
- Outcomes of PBL/ Problem Solving Skills/ Solution provided/ Final product **(50%)** (Individual assessment and team assessment)
- Documentation (Gathering requirements, design & modeling, implementation/execution, use of technology and final report, other documents) **(25%)**
- Demonstration (Presentation, User Interface, Usability etc) **(10%)**
- Contest Participation/ publication **(5%)**
- Awareness /Consideration of -Environment/ Social /Ethics/ Safety measures/Legal aspects **(5%)**

PBL workbook will serve the purpose and facilitate the job of students, mentor and project coordinator. This workbook will reflect accountability, punctuality, technical writing ability and work flow of the work undertaken.

E. Internship

R4.7

Student may choose to undergo Internship at Industry/Govt./NGO/MSME/Rural Internship/ Innovation/ IPR/Entrepreneurship. Student may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/NGO's/Government organizations/Micro/Small/ Medium enterprises to make themselves ready for the industry[4].

Every student is required to prepare a maintain documentary proofs of the activities done by him. The evaluation of these activities will be done by Programme Head/Cell In-charge/ Project Head/ faculty mentor or Industry Supervisor based on- Overall compilation of internship activities, sub-activities, the level of achievement expected, evidence needed to assign the points and the duration for certain activities.

Based on internship the assessment and evaluation parameters may include as-

- Working for consultancy/ research project,
- Participation at Events (Technical / Business)
- Participation in innovation related completions for eg. Hackathon etc.),
- Contribution in Incubation/ Innovation/ Entrepreneurship Cell/ Institutional Innovation Council,
- Learning at Departmental Lab/Tinkering Lab/ Institutional workshop,
- Development of new product/ Business Plan/ registration of start-up,
- Participation in IPR workshop/Leadership Talks/ Idea/ Design/ Innovation/ Business Completion/ Technical Expos.

It is necessary to produce participation certificate, if applicable.

F. Seminar and Communication Skills

R4.8

Seminar is the first formal curricular activity at the UG level, where students are supposed to exhibit their communication skills and knowledge by undertaking the study of the chosen topics. Core objective is to explore the basic principles of communication (verbal and non-verbal) and

Shree Ramchandra College of Engineering Pune

Principal
Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

active, empathetic listening, speaking and writing techniques. It exposes the student to new technologies, researches, products, and services.

Authorities/ examiner (optional) along with a guide would be assessing the seminar work based on various parameters which may include- Topic selection, Contents and Presentation, regularity, Punctuality and Timely Completion, Question and Answers, Report, Paper Presentation/Publication, Attendance and Active Participation in overall class activity.

G. Project Work at Final Year

R4.9

Progress of project work is monitored regularly on weekly project slot/project day. Regular interval presentations are to be arranged to review and assess the work. During process of monitoring and continuous assessment AND evaluation the individual and team performance is to be measured.
Project work is monitored and continuous assessment is done by guide and authorities. During university examination Internal examiner (preferably the guide) and External examiners jointly, evaluate the project work. Recommended performance measure parameters may include-Problem definition and scope of the project, Literature Survey, Appropriate Engineering approach used, Exhaustive and Rational Requirement Analysis, Comprehensive Implementation- Design, modeling, documentation, Usability, Optimization considerations(Time, Resources, Costing), Thorough Testing, Project Presentation and Demonstration(ease of use and usability), Social and environment aspects, Presentation of work in the form of Project Report(s), Understanding individual capacity, Role & involvement in the project, Team Work (Distribution of work, intra-team communication and togetherness), Participation in various contests, Publications and IPR, Manuals(Project Report, Quick reference, System, Installation guide) among other parameters.

5. Rules of Passing

R5.1

To pass the Term Work / Practical / Oral/ presentation the student has to earn Minimum of 40 percent marks in each respective examination head.

R5.2

To pass the Theory Subject head the student has to earn minimum of 40 percent marks in End-Semester examination and 40 percent total marks (In-Semester Examination and End-Semester Examination).

R5.3

The failing student can repeat the End-semester examination to pass the head in any semester and the In-Semester Examination marks will be retained as it is. OR the failing student can repeat for the End-Semester Examination as well as In-semester examination for the head of Even semester in the Even semester only and for the head of Odd semester in the Odd semester only for the theory head

R5.4

To earn credits of a course (Theory/term work/practical/oral/presentation) student must pass the course with minimum passing marks/grade.

R5.5

Student can apply only for the Revaluation/Photocopying of End-Semester theory examination.

6. Rules of ATKT (Allowed To Keep Term):

R6.1

A student can register for the third semester (SE), if he/she earns minimum 50% credits of the total of first and second semesters (FE).

R6.2

A student can register for the fifth semester (TE), if he/she earns minimum 50% credits of the total of third and forth semesters (SE) and all the credits of first and second semester (FE).

R6.3

A student can register for the seventh semester (BE), if he/she earns minimum 50% credits of the total of fifth and sixth semesters(TE) and all the credits of third and forth semester(SE).

Shree Ramchandra College of Engineering Pune

Principal
Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

R6.4

A student will be awarded the bachelor's degree if he/she earns 170 credits and clears all the mandatory non credit courses in respective semesters

7. Assessment and Grade Point Average:

R7.1 Marks/Grade/Grade Point

A grade is assigned to each head based on marks obtained by a student in examination of the course. The marks obtained in In-semester and end-semester examination are considered together to calculate the grade of the course. These grades, their equivalent grade points are given in Table 11.

TABLE 11. Grade and Grade Point

Grade	Grade Point	Percentage of Marks Obtained	Remarks
O	10	90-100	Outstanding
A	9	80-89	Very Good
B	8	70-79	Good
C	7	60-69	Fair
D	6	50-59	Average
E	5	40-49	Below Average
F	0	Below 40	Fail
FX	0	–	Detained, Repeat the Course
IC	0	–	Incomplete Course-- Absent for Exam but continue for the course
AC	–	–	Audit Course Completed
ACN	–	–	Audit Course Not Completed

7. Passing Grade:

- The grades O, A, B, C, D, E are passing grades.
- A candidate acquiring any one of these grades in a course shall be declared as PASS. And student shall earn the credits for a course only if the student gets passing grade in that course.
- F Grade -The grade F shall be treated as a failure grade.
- The student with F grade will have to pass the concerned course by re-appearing for the examination.
- The student with F grade for any stage of the Project Work, will have to carry out additional work/ improvement as suggested by the examiners and re-appear for the examination.
- AC and ACN Grade -The student registered for audit course shall be awarded the grade AC after satisfactory completion of audit course and shall be included in the Semester grade report for that course, provided student has the minimum attendance as prescribed by the SPPU and satisfactory In-semester performance and secured a passing grade in that course. Student who is unable to complete audit course will be awarded as ACN grade.
- FX Grade-The grade FX in a course is awarded by the college, if a student does not maintain the minimum attendance in the Lecture / Tutorial class as prescribed by the SPPU and/or his performance during the semester is not satisfactory and/or he/she fails in the Term Work head of that course.
- The student with FX grade in a given course is not permitted to take the end of semester examination in that course. Such a student will have to re-register for the course.
- The student with F / FX in a course shall not be awarded any credits for that course.

Shree Ramchandra College of Engineering Pune

Principal
Shree Ramchandra Education Society's
Shree Ramchandra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412216

8. Performance Indices:

R8.1

The semester end grade sheet will contain grades for the courses along with titles and SGPA. Final grade sheet and transcript shall contain CGPA.

R8.2

SGPA -The performance of a student in a semester is indicated by a number called the Semester Grade Point Average (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses, seminars and projects registered by the student during the semester.

Semester Grade Point Average (SGPA) = $\frac{\sum_{i=1}^{P} CiGi}{\sum_{i=1}^{P} Ci}$

$$\text{SGPA} = \frac{\sum \text{GradePointsEarnedXCreditsForEachCourse}}{\text{TotalCredits}}$$

For Example: suppose in a given semester a student has registered for five courses having credits C1, C2, C3, C4, C5 and his / her grade points in those courses are G1, G2, G3, G4, G5 respectively. Then students

$$\text{SGPA} = \frac{C1G1+C2G2+C3G3+C4G4+C5G5}{C1+C2+C3+C4+C5}$$

SGPA and CGPA is calculated up to two decimal places by rounding off.

R8.3

CGPA- The CGPA is the weighted average of the grade points obtained in all the courses (Theory/term work/practical/oral/presentation) of first semester to eighth semester for the students admitted in the First year and third to eighth semester for the students directly admitted at Second year.

CGPA is calculated in the same manner as the SGPA.

R8.4

In case of a student passing a failed course or in case of improvement, the earlier grade would be replaced by the new grade in calculation of the SGPA and CGPA.

9. Result:

R9.1

Based on the performance of the student in the semester examinations, the Savitribai Phule Pune University will declare the results and issue the Semester Grade sheets. The class shall be awarded to a student on the CGPA calculated. The award of the class shall be as per Table 12.

Table 12. 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

X. References

[1] https://www.aicte-india.org/sites/default/files/Vol%20I_UG.pdf

[2] https://www.aicte-india.org/sites/default/files/induction-guide-jun17-aicte%20(1).pdf

[3]https://www.aicteindia.org/sites/default/files/ FINAL%20BEST%20PRACTICES% 20 IN %20AICTE%20APPROVED%20INSTITUTUIONS.pdf

[4] https://www.aicte-india.org/sites/default/files/AICTE%20Internship%20Policy.pdf

[5] https://www.aicte-india.org/sites/default/files/ExaminationReforms.pdf

[6] https://www.aicte-india.org/education/model-syllabus

Principal
Shree Ramchandra Education Society's
Shree Ramchndra College of Engineering
Pune-Nagar Road, Lonikand, Pune-412...