BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

YELAHANKA, BENGALURU-560 064

DEPARTMENT OF PHYSICS

LABORATORY MANUAL

I/II SEMESTER (CBCS SCHEME)

SUBJECT: ENGG. PHYSICS LAB

SUBJECT CODE: 18PHYL 16/26

PREPARED BY:

Staff members, Department of Physics,
BMSIT&M.

December 2020

PERFORMANCE SHEET

NAME OF THE CANDIDATE:

SECTION: **SEMESTER: I/II**

ROLL NO/USN:

Max. Marks for each expt. 30

Sl. No.	Name of the Experiment	Marks	Initial of staff
1.	TORSIONAL PENDULUM		
2.	TRANSISTOR CHARACTERISTICS		
3.	FERMI ENERGY OF COPPER		
4.	SERIES AND PARALLEL LCR CIRCUITS		
5.	NEWTON'S RINGS		
6.	YOUNG'S MODULUS BY SINGLE CANTILEVER		
7.	DIELECTRIC CONSTANT		
8.	LASER DIFFRACTION GRATING		
9.	NUMERICAL APERTURE		
10.	DETERMINATION OF SPRING CONSTANT		
11.	PHOTO DIODE		
12.	MAGNETIC INTENSITY		

	ALONG THE AXIS OF A COIL		

Signature of Batch in charge **Signature of Head of the Dept.**

DEPARTMENT OF PHYSICS

DOs

- Bring observation book, Lab manual & record book regularly.
- Write the write up of the experiment in advance in the observation book before coming to the practical class.
- Bring calculator to the practical class regularly.
- Handle the apparatus/equipment gently and carefully.
- Return the apparatus collected, to lab instructor before leaving the lab.

DON'Ts

- Dumping your bag on the work table.
- Giving your observation book and record books to others.
- Forgetting to check your belongings before leaving the lab.
- Spoiling of the apparatus/equipment as it is meant for your benefit only.
- Switch on electronic equipment before getting the approval by the teacher/instructor.
- Bringing mobile phones inside the Laboratory.

Instructions to students:

1. All calculations must be carried out using SI units.
2. All entries in the observation book should be done using pen only.
3. Wherever graphs have to be plotted plotting has to be done using pencil only.

CONTENTS

1. TORSIONAL PENDULUM

AIM: To determine the moment of inertia of an irregular body and to calculate the rigidity modulus of the material by the principle of torsional pendulum.

FORMULA:

Moment of Inertia of an irregular body is given by

$$I_0 = \left(\frac{I}{T^2}\right)_{mean} \times T_0^2 \qquad \text{kgm}^2 \tag{1}$$

Where I_0 is the moment of Inertia of an irregular body in kg.m^2

I is the moment of inertia of regular body in kg.m^2

T is the period of torsional oscillation of regular body in s.

T_0 is the period of oscillation of an irregular body in s.

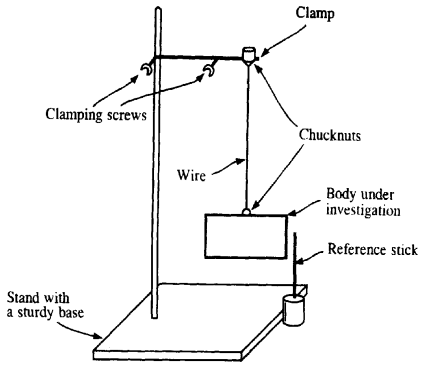
The rigidity modulus of the material of the wire is given by

$$\eta = \left(\frac{8\pi l}{r^4}\right)\left(\frac{I}{T^2}\right)_{mean} \qquad \text{N/m}^2 \tag{2}$$

Where l is the length of the wire in m.

r is the radius of the wire in m.

FIGURE:



TORSIONAL PENDULUM

Fig. 1

PRINCIPLE: The moment of inertia of a body about a given axis of rotation is defined as the product of mass of the body and the square of radius of gyration. The ratio of moment of inertia to the square of period of oscillation is constant for different axes of regular bodies will be constant for a given length of the wire. There is no direct formula to determine the moment of inertia of an irregular body about any axis. Hence, by the principle of torsional pendulum (I/T^2) of a regular body = ($I_0/T_0^{2)}$ of irregular body. By knowing the mean (I/T^2) for regular bodies & the period of oscillation of an irregular body, the moment of inertia of irregular body can be calculated using the formula.

PROCEDURE:

- The mass (M_1) of the given circular disc and mass (M_2) of rectangular plate are indicated on the respective plates. The radius of the circular disc (R), length (L) and breadth (B) of the rectangular plate are also indicated on the respective plates. The moment of inertia values of the bodies about the respective axes are determined using the formulae indicated in the tabular column.
- The circular disc is suspended using the check nuts of the experimental wire such that the axis of suspension is perpendicular to the plane of the disc. A convenient reference mark is made on the edge of disc, using a piece of chalk and a reference pointer is placed just in front of the circular disc. The base of the chuck nut is twisted through a small angle **(small amplitude)** such that torsional oscillations are setup. A stop clock is started when the reference mark on the body crosses the reference stick in a particular direction. The time taken for the reference mark on the plate to cross the reference pointer in the same direction is taken as time for one oscillation. The time taken for 5, 10 and 15 such oscillations is noted using a stop clock. The period of oscillations is calculated by dividing the time taken for 10 oscillations by 10 and the mean period of oscillation is calculated.
- Again, suspend the circular disc in such a way that, the axis of the suspension passes through the diameter of the disc. The mean period of oscillation is calculated by repeating the above procedure.
- Then circular disc is removed from the wire and the rectangular plate is suspended, first about an axis perpendicular to the plane of the plate, next about an axis perpendicular to the length and lastly about an axis perpendicular to its breadth.
- The mean period of oscillation is calculated in each case separately. For each axis of suspension of circular & rectangular bodies, the ratio of moment of inertia to the square of period of oscillation i.e. (I/T^2) is calculated and hence, the mean value of (I/T^2) is calculated.

PART I: To determine moment of inertia of irregular body

- The given irregular body is suspended by the experimental wire, with an axis of suspension perpendicular to its plane or its length or its breadth of the irregular body. The body is set in to torsional oscillation and the period of oscillation (T_0) is calculated.
- The moment of inertia of the irregular body (I_0) about an axis is calculated by taking the mean value of (I/T^2) from the regular bodies using the formula.

$$I_0 = \left(\frac{I}{T^2}\right)_{mean} \times T_0^2 \qquad \text{kgm}^2$$

PART II: To determine the rigidity modulus of the material of the experimental wire.

- The length (l) of the wire between the two chuck nuts is found by using a thread or scale. Using the radius of the wire which is given and by noting the mean value of (I/T^2) of regular bodies, the rigidity modulus of the material of the wire is calculated using the formula

$$\eta = \left(\frac{8\pi l}{r^4}\right)\left(\frac{I}{T^2}\right)_{mean} \qquad N/m^2$$

OBSERVATIONS

Mass of the circular plate	M_1 = --------- Kg
Radius of the circular plate	R = --------- $x10^{-2}$ m
Mass of rectangular plate	M_2 = --------- Kg
Length of the rectangular plate	L = ------- $x10^{-2}$ m
Breadth of the rectangular plate	B = ------ $x10^{-2}$ m
l is the length of the wire	l = ------- $x10^{-2}$ m
r is the radius of the wire	r = 0.45 x 10^{-3} m

TABULAR COLUMN

1. Calculation of moment of inertia of regular bodies

Body	Axis of suspension	Moment of Inertia (I) kgm^2	No. of oscillations	Time 't' (sec)	No. of oscillations	Time 't' (sec)	Time (t) take For 10 oscillati	Avg. Time (t) taken for 10 oscillations	Period T =t/10 sec	T^2	(I / T^2) Kgm^2/S^2
Circular plate	Perpendicular to the plane	$I_1 = (M_1R^2) / 2$	0 5		10 15				T_1		I_1/T_1^2=
	Along the diameter	$I_2 = (M_1R^2) /4$	0 5		10 15				T_2		I_2/T_2^2=
Rectangular plate	Perpendicular to the plane	$I_3 = [M_2 (L^2+B^2)] / 12$	0 5		10 15				T_3		I_3/T_3^2=
	Perpendicular to the length	$I_4 = (M_2 L^2) / 12$	0 5		10 15				T_4		I_4/T_4^2=
	Perpendicular to the breadth	$I_5 = (M_2 B^2) / 12$	0 5		10 15				T_5		I_5/T_5^2=

Mean value of (I/T^2) = ---------- kgm^2/s^2

2. Calculation of moment of inertia of an irregular body

Axis of	No. of	Time	No. of	Time	Time (t) taken	Avg. Time (	Period	T_0^2	Moment of inertia of

suspension	oscillations	't' sec	oscillations	't' sec	For 10 oscillation	taken for 10 oscillations	$T_0 = t/10$		irregular body $I_0 = (I/T^2)_{mean} \times T_0^2$
Perpendicular to its plane	**0** **5**		**10** **15**						I_0 = -------

Length of the wire between the chuck nuts l = - - - - - cm

= - - - - - x 10^{-2} m

Calculation of Rigidity modulus $\eta = \left(\frac{8\pi l}{r^4}\right)\left(\frac{I}{T^2}\right)_{mean}$

= ---------- N/m^2

RESULT:

1. The moment of inertia of the given irregular body about an axis perpendicular to its plane is found to be I_0 = ---------- kgm^2

2. The rigidity modulus of the material of the wire is η = -------- N/m^2.

PRECAUTION:

While changing the axis of the plates care should be taken to see that the wire does not break. Therefore the chuck nut should be removed from the top.

BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

YELAHANKA BENGALURU – 560064

DEPARTMENT OF PHYSICS

Academic year 2020-2021

Date: 22/10/2020

Course Name: Engineering Physics Lab

course code: 18PHYL16/26

Course Outcomes (COs):

At the end of the course , the students are able to

CO1: Understand the concepts required for measurement of physical parameters related to engineering.

CO2: Identify the experiments to verify physical laws applicable to engineering and technology.

CO-PO Matrix :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										
CO2	3	2										

HoD, Physics 22/10/2020

BMS
Institute of Technology and Management
Avalahalli, Yelahanka – 560 064

DEPARTMENT OF PHYSICS

Date: 19/08/2019

ENGINEERING PHYSICS LAB (18PHYL16), I SEM AUG.2019

RUBRICS

Headings	Description	Marks distribution	Max. Marks
Observation	Formula with units and explanation of terms	1	5
	Tabular column with units and ranges	2	
	Circuit / ray diagram with labelling	1	
	Least count formula / specimen graph	1	
Circuit connection	Independent correct connections	5	5
	Connections with minor error	3	
	Connections with major error	2	
Readings	All reading / trials taken	5	10
	100% Expected readings	5	
	25% deviation in readings	3	
	50 % deviation in readings	2	
Calculation	Formula and Substitution	1	5
	Simplification	1	
	Result with units	1	
	Accuracy (tolerance ±10%)	2	
Approval /Record submission	Observation approval intime (same day or next working day)	3	5
	Record submission (next working lab)	2	

Total Marks = 30

19/8/2019

HoD, Dept. of Physics

PROFESSOR AND HEAD
DEPARTMENT OF PHYSICS

B.M.S. INSTITUTE OF TECHNOLOGY AND MANAGEMENT

Yelahanka, Bengaluru - 560 064.

RECORD OF PRACTICAL WORK

NAME	I BHARGAV TEJA	UNIVERSITY SEAT NUMBER (USN)	1BY20CS067
PROGRAMME	Computer Science Engineering	SEMESTER / SECTION	I/B
COURSE CODE	18PHYL16	COURSE NAME	Engineering Physics Lab

B.M.S. INSTITUTE OF TECHNOLOGY AND MANAGEMENT
Yelahanka, Bengaluru - 560 064.

LABORATORY CERTIFICATE

This is to Certify that Mr./~~Ms.~~ I BHARGAV TEJA

has Satisfactorily completed the course of experiments in Practical

ENGINEERING PHYSICS LAB Prescribed

by the Visvesvaraya Technological University for I

Semester COMPUTER SCIENCE Course in the Laboratory of the college

in the year 2020 - 2021

Head of the Department

Staff incharge of the Batch

Date :

Marks	
Maximum	Obtained
040	037

Name of the Candidate : I BHARGAV TEJA

Roll No. : 28 USN : 1BY20CS067

Signature of the Candidate

Particulars of the Experiments Performed

CONTENTS

Expt No.	Date	Experiment	Marks Obtained	Page No.
1	10/02/2021	To determine the young's modulus of the material of the given beam by the method of single cantilever	28/30	01-04
2	17/02/2021	Determination of Fermi energy of copper using a Wheatstone metre bridge	29/30	04-08
3	17/02/2021	a) To determine spring constant for the material of the given spring and b) To determine spring constant in series and parallel combination	29/30	09-13
4	19/02/2021	To determine the wavelength of laser light by diffraction technique using a plane diffraction grating	29/30	10-16
5	19/02/2021	To determine the dielectric constant of the given dielectric material by the method of charging and discharging	28/30	17-19
6	24/02/2021	To determine the acceptance angle and Numerical apperture of an optical fiber	30/30	20-22

Particulars of the Experiments Performed

CONTENTS

Total: 346/360

Date.....

Expt. No. ..... Page No. .....

Avg. Record 28.8 Test

Record Test Total Final I.A

29/30 + 08/10 = 37/40

Teacher's Signature : .....

Date...10/02/2021.....

Expt. No. .....01..... Page No. .....01.....

YOUNG'S MODULUS BY SINGLE CANTILEVER

Aim:- To determine the young's modulus of the material of the given beam by the method of single cantilever.

Apparatus:- Single cantilever setup, slotted weights, travelling microscope, reading lens and lamp.

Principle:- ~~Single~~ The experiment is based on the theory of bending moment of beams.
Bending moment of a beam depends on the following factors:
a) Young's modulus of the material of the beam
b) The cross section geometry of the beam.

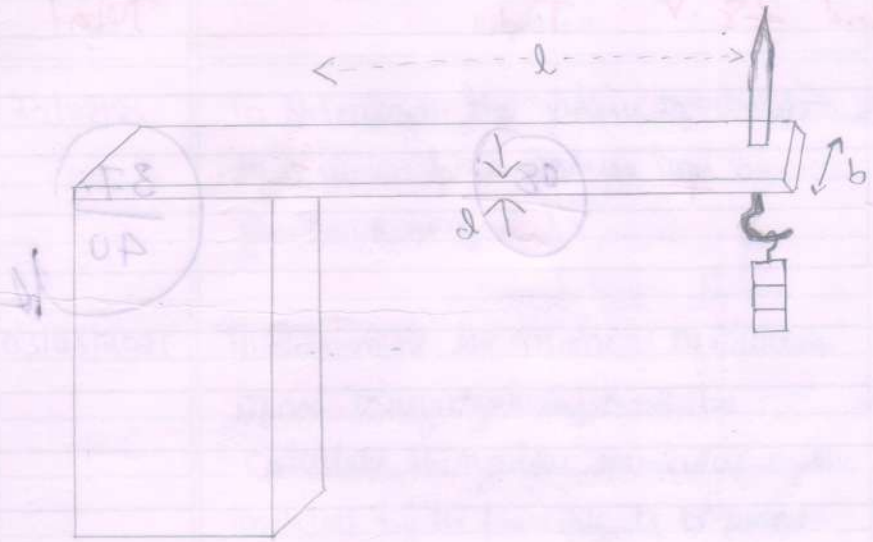
Formula:

$$Y = \frac{4Mgl^3}{bd^3\delta} \ N/m^2$$

Where, M - mass for which depression is found (in kg)
g - acceleration due to gravity ($= 9.8 ms^{-2}$)
l - distance between the needle and fixed end (in m)
b & d - breadth and thickness of the wooden scale (in m)
δ - Mean elevation produced (in m).

Teacher's Signature : .....

Diagram



Tabular column to find elevation

Load in hanger (g)	Load increasing MSR (cm)	CVD	TR (cm)	Load Decreasing MSR (cm)	CVD	TR (cm)	Mean R_1 (cm)	Load in hanger (g)	Load increasing MSR (cm)	CVD	TR (cm)	Load Decreasing MSR (cm)	CVD	TR (cm)	Mean R_2 (cm)	Depression $\delta = R_1 - R_2$ (cm).
X+0	5.6	4	5.604	5.6	18	5.618	5.611	X+60	4.95	42	4.992	4.95	48	4.998	4.995	0.616
X+20	5.4	3	5.403	5.3	20	5.32	5.361	X+80	4.75	25	4.775	4.75	28	4.778	4.7765	0.585
X+40	5.2	24	5.224	5.2	30	5.23	5.227	X+100	4.55	5	4.555	4.55	5	4.555	4.555	0.672

Mean depression, $\delta = 0.6243 \times 10^{-2}$ m

Date.....

Expt. No. .....01..... Page No. .....02.....

Procedure :-

- The tip of the needle (inverted image) on the single cantilever is made to coincide with the intersection of the cross wire of the travelling microscope (with no load in the hook).
- Note down the readings of the travelling microscope in the tabular column as the dead load readings (i.e. x g)
- Now add some weight to the hook (say 20g). Again coincide the tip of the needle to the intersection of the cross wire and corresponding readings are noted in the tabular column.
- This is repeated upto 100g in steps of 20g every time and corresponding readings are noted in the tabular column.
- The experiment is repeated by decreasing the load in the weight hanger in steps of 20g and the corresponding readings are taken and are tabulated.
- The depression or deflection of the cantilever beam 'δ', for load 'M' in kg is found out from the tabular column.
- By using the breadth(b) and thickness(d) of the bar, the young's modulus of the material of the beam is calculated.

Least count of travelling microscope:

LC = Value of 1 MSD − Value of 1 VSD (or) $LC = \frac{\text{Value of 1 MSD}}{\text{Number of VSD}}$

$TR = MSR + (CVD \times LC)$.

Result :- Young's modulus of the material of the beam is found to be $Y = 16.32 \times 10^{10}$ N/m²

17/2/21

Teacher's Signature : .....

Calculations :-

LC = 0.001cm. TR = MSR + (CVD × LC)

Load increasing

TR = 5.6 + (14 × 0.001) TR = 5.14 + (3 × 0.001) TR = 5.2 + (22 × 0.001)

= 5.6 + 0.014 = 5.14 + (0.003) = 5.2 + 0.022

= 5.614 cm. = 5.143 cm = 5.222 cm

TR = 4.95 + (42 × 0.001) TR = 4.75 + (25 × 0.001) TR = 4.55 + (0.005)

= 4.95 + 0.042 = 4.75 + 0.025 = 4.55 + 0.005

= 4.992 cm. = 4.775 cm = 4.555.

Load decreasing

TR = 5.6 + (18 × 0.001) TR = 5.3 + (20 × 0.001) TR = 5.2 + (30 × 0.001)

= 5.6 + 0.018 = 5.3 + (0.020) = 5.2 + (0.030)

= 5.618 cm = 5.32 cm. = 5.23 cm.

TR = 4.95 + (48 × 0.001) TR = 4.75 + (28 × 0.001) TR = 4.55 + (5 × 0.001)

= 4.95 + 0.048 = 4.75 + (0.028) = 4.55 + (0.005)

= 4.998 cm = 4.778 cm = 4.555 cm

$\delta = 5.611 - 4.995 = 0.616$ cm $\delta = 5.361 - 4.776 = 0.585$ cm $\delta = 5.227 - 4.555$

$\delta = 0.616$ cm $\delta = 0.585$ cm $\delta = 0.672$ cm

$$Y = 4Mgl^3/bd^3\delta \ N/m^2$$

$$= \frac{4 \times 60 \times 9.8 \times (12 \times 10^{-2})^3 \times 10^{-3}}{2.4 \times 10^{-2} \times (0.55 \times 10^{-3})^3 \times 0.643 \times 10^{-2}}$$

$$= \frac{240 \times 9.8 \times 1728 \times 10^{-6} \times 10^{-3}}{2.4 \times 10^{-2} \times 0.1663 \times 10^{-9} \times 0.6243 \times 10^{-2}}$$

$$= 4.064 \times 10^{-3} / 0.249 \times 10^{-13}$$

$Y = 16.32 \times 10^{10} \ N/m^2$

Date.....

Expt. No. ..... Page No. .....03.....

Viva Questions

1. Define Young's modulus

-> It is a measure of elasticity, equal to the ratio of the stress acting on a substance to the strain produced.

W – 5/5
C – 5/5
R – 14/15
Cal –
Record – 4/5
28
30

2. How many types of stresses are there?

-> Three types:-

i) Normal stress
ii) Tangential stress or Shearing stress
iii) Hydraulic stress.

3. What is elasticity? Give an example for an elastic body.

-> It is ability of deformed materid body to return to its original shape and size when the forces causing the deformation are removed.
Ex: Quartz fibre and Phosphor bronze.

4. Explain the term stress, strain.

-> ~~Str~~ Stress: It is ratio of force experienced by the body to Area of cross section of body.

-> Strain: It is the change in the shape of an Object when stress is applied

5. State Hook's law.

-> According to Hook's law, body's strain is directly proportional to the applied force. if the applied force is within an elastic limit

Teacher's Signature : .....

BMS INSTITUTE OF TECHNOLOGY & MANAGEMENT - BANGALORE

DEPARTMENT OF PHYSICS

Course: **Engineering Physics lab** **course code: 18PHYL26**

ACADEMIC YEAR : **2020-21**
I semester **(EVENSEM)**
FACULTY INCHARGE: **Dr. Daruka Prasad B**
Branch: **ECE**
Section: **H**

Target for co attainment

60% of students scoring 60% of marks : grade 3
55% of students scoring 60% of marks : grade 2
50% of students scoring60% of marks : grade 1

DIRECT ATTAINMENT

	Sl No	Name	Internal	Percentage	Grade	Target>=60%	External	Percentage	Grade	Target>=60 %
1	1BY20EC001	Aakash Kumar Singh	13	32.5	1		35	58	2	
2	1BY20EC002	Aashritha	23	57.5	2		45	58	2	
3	1BY20EC003	Abhay Singh	40	100	3	y	50	75	3	y
4	1BY20EC004	Abhishek K	27	67.5	3	y	50	83	3	y
5	1BY20EC005	Abhishek Kumar	17	42.5	1		49	83	3	y
6	1BY20EC006	Abhishek Nagesh Shett	36	90	3	y	48	82	3	y
7	1BY20EC007	Abhishek Yadav	32	80	3	y	48	80	3	y
8	1BY20EC008	Achyuth Rao H	27	67.5	3	y	48	80	3	y
9	1BY20EC009	ACHYUTHA GOWDA C P	33	82.5	3	y	50	80	3	y
10	1BY20EC010	A TEJA	30	75	3	y	47	83	3	y
11	1BY20EC011	ADITHYA R	40	100	3	y	50	78	3	y
12	1BY20EC012	ADITYA SRINIVAS K	26	65	3	y	49	83	3	y
13	1BY20EC013	Aishwarya N	36	90	3	y	50	82	3	y
14	1BY20EC014	Ajay Basha Komali	20	50	2		45	83	3	y
15	1BY20EC015	AKHIL MP	30	75	3	y	50	75	3	y
16	1BY20EC016	Akhilesh N	33	82.5	3	y	49	83	3	y
17	1BY20EC017	Akshata Dabrabad	23	57.5	2		49	82	3	y
18	1BY20EC018	Akshatha S	34	85	3	y	49	82	3	y
19	1BY20EC019	Akshay goudar	13	32.5	1		48	82	3	y
20	1BY20EC020	AKSHAYA SUBRAHMAN	38	95	3	y	49	80	3	y
21	1BY20EC021	ALLA VAMSI KRISHNA	38	95	3	y	49	82	3	y
22	1BY20EC022	Aman Kumar	32	80	3	y	48	82	3	y
23	1BY20EC023	AMOGH DIXIT	25	62.5	3	y	49	80	3	y
24	1BY20EC024	AMULYA M KAUSHIK	40	100	3	y	49	82	3	y
25	1BY20EC025	Anand A B	39	97.5	3	y	49	82	3	y
26	1BY20EC026	ANANYA.R	30	75	3	y	49	82	3	y
27	1BY20EC027	Aniket Sharma	31	77.5	3	y	50	82	3	y
28	1BY20EC028	A SASI SEKHAR	19	47.5	1		37	83	3	y
29	1BY20EC029	Anubhav Kumar	31	77.5	3	y	49	62	3	y
30	1BY20EC030	APOORV SHANDILYA	32	80	3	y	48	82	3	y
31	1BY20EC031	Archana B	37	92.5	3	y	50	80	3	y
32	1BY20EC032	ARUNABH RANJAN	21	52.5	2		48	83	3	y
33	1BY20EC033	Arya Murali	33	82.5	3	y	49	80	3	y
34	1BY20EC034	Ashish Srinivasan	30	75	3	y	49	82	3	y
35	1BY20EC035	Ashwin Ajay	NE	#VALUE!	#VALUE!	#VALUE!	0	82	3	y
36	1BY20EC036	Asif Ayoub Bhatti	30	75	3	y	45	82	3	y
37	1BY20EC037	ATISH MARAGUR	33	82.5	3	y	50	0	0	
38	1BY20EC038	B Meghana	40	100	3	y	49	75	3	y
39	1BY20EC039	Bhaswati Talukdar	34	85	3	y	50	83	3	y
40	1BY20EC040	Bhavitha D S	35	87.5	3	y	50	82	3	y
41	1BY20EC041	Bheemireddy Harini	32	80	3	y	42	83	3	y
42	1BY20EC042	Bhumika R	NE	#VALUE!	#VALUE!	#VALUE!	0	83	3	y
43	1BY20EC043	Bhumika T V	26	65	3	y	49	70	3	y
44	1BY20EC044	Bhuvan A R	25	62.5	3	y	49	0	0	
45	1BY20EC045	Bhuvana H	24	60	3	y	47	82	3	y
46	1BY20EC046	Bittu Kumar	25	62.5	3	y	47	82	3	y
47	1BY20EC047	Chandana A	38	95	3	y	50	78	3	y
48	1BY20EC048	CHANDNI KUMARI	27	67.5	3	y	45	83	3	y
49	1BY20EC049	Chandu B R	35	87.5	3	y	50	75	3	y
50	1BY20EC050	CHARAN G S	31	77.5	3	y	49	83	3	y
51	1BY20EC051	Chirag Kumar N	32	80	3	y	50	82	3	y
52	1BY20EC052	Deekshitha B S	36	90	3	y	50	83	3	y
53	1BY20EC053	Deepak Darshan P	27	67.5	3	y	49	83	3	y
54	1BY20EC054	Deepika R	31	77.5	3	y	50	82	3	y
55	1BY20EC055	deepti hp	39	97.5	3	y	49	83	3	y
56	1BY20EC056	Devaraj	24	60	3	y	49	82	3	y
57	1BY20EC057	Dharani S	33	82.5	3	y	49	82	3	y
58	1BY20EC058	Divyashree.S	25	62.5	3	y	50	82	3	y
59	1BY20EC059	Duggasani venkata pra	16	40	1		44	83	3	y
60	1BY20EC060	Enosh J	40	100	3	y	49	73	3	y
61	1BY20EC061	G MEENAKSHI	40	100	3	y	50	82	3	y
62	1BY20EC062	G THARUN	29	72.5	3	y	49	83	3	y
63	1BY20EC063	Gagandeep S	22	55	2		45	82	3	y
64	1BY20EC064	GANDLAPARTHI NAVYA	37	92.5	3	y	49	75	3	y
					No. OF Y	52			No. OF Y	66

	% Of attainme	attained grade	ATTAINED
CO1	72	3	Y
CO2	72	3	Y

	% Of attair	attained grade
CO1	91.66667	3
CO2	91.66667	3

	Internal attainment	External attainment	
CO1	3	3	3
CO2	3	3	3

Cii	0

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										
CO2	3	2										

Final CO-PO mapping:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										
CO2	3	2										
Ciii	3	2										

Final Subject-PO mapping:
Enter Average attainment for the CO

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Engg Physics lab	3	2.00										