B.Sc Part-I Honours Examination 2020

PHSA

PAPER-2B

F.M.-50

UNIT-I (F.M.-20)

Answer any one question

Question 1. Moment of Inertia and Modulus of Rigidity

(a)Write down the relevent theory of the experiment - (5)

(b) Calculate the value of moment of Inertia and modulus of rigidity from the following data:-

Oscillating Body	Time period	Dimension of the body	Mass of the body	
EMPTY CRADLE	2.42 secs			
CRADLE + SQUARE BODY	2.58 secs	LENGTH=BREADTH= 5.08cm	486 gm	
CRADLE + CYLINDER	2.71 secs	DIAMETER OF CYLINDER=5.732cm	1016 gm	
Suspension wire		Length= 62 cm Diameter of wire=0.98mm		

Determine the moment of inertia of a metallic cylinder about an axis passing through its C.G. and perpendicular to its length from the above data. SQUARE BODY IS THE REFERENCE BODY
(10+5)

UNIT-II (F.M.-30)

Answer any one question

Question 1.

(a) Construct a half –adder using basic gates and verify the truth table, (theoretically)

(b) Construct a full –adder using basic gates and verify its truth table. (theoretically)

Distribution of marks:

(I)PIN configuration of the IC's containing basic gates
2+2+2

(ii) Theory +Truth Table+Circuit (Half adder)
4+4+4

(iii) Theory +Truth Table+Circuit (Full adder)
4+4+4

Question 2

Studying nature of dipolar field using a short bar magnet by magnetometer.

(a) Working formula of the above experiment to be written.
5

(b) Calculate the moment of inertia of the magnet from the given data
5

(c) Draw tanΘ versus $1/d^3$ from the given data
10

(d) Calculate the horizontal component B_H of the earth's magnetic field from the given data

5

(e) What are TAN A and TAN B position of magnets.
5

DATA FOR CALCULATION:-

MASS OF MAGNET-48 gm

DIMENSIONS OF THE MAGNET:- LENGTH=4.96cm, BREADTH=1.50cm

TIME PERIOD OF OSCILLATION OF MAGNET-5.04secs

DEPENDENCE OF DIPOLAR FIELD

d in m	Θ degree
0.209	35
0.197	40
0.185	45
0.175	50
0.165	55