

# WEEKLY TEST - 2080/04/28

XII (SCIENCE)

Subject: Physics

F. M.: 40

P. M.: 20

Time: 1.30 hrs.

Set : 'A'

Attempt all the Questions

## Group-A

[7x1=7]

1. S.I. unit of moment of inertia is (a)  $\text{kg}^2\text{m}$  (b)  $\text{kgm}^2$  (c)  $\text{kgm}^{-1}$  (d)  $\text{kg}^{-1}\text{m}^2$
2. A simple pendulum is set into vibrations. The bob of the pendulum comes to rest after some time due to (a) air friction (b) moment of inertia (c) the weight of the bob (d) a combination of all the above
3. Two bodies have their moments of inertia  $I$  and  $2I$  respectively about their axis of rotation. If their kinetic energies of rotation are equal, their angular momentum will be in the ratio: a) 1:2 b)  $\sqrt{2}:1$  c) 2:1 d)  $\frac{1}{\sqrt{2}}$
4. Kirchhoff's junction rule is based on the principle of conservation of (a) charge (b) energy (c) momentum (d) mass.
5. The motion of electron is affected (a) electric field only (b) magnetic field only (c) both electric & magnetic field (d) none
6. An electron is moving with a velocity 'v' & enters a uniform electric field perpendicularly. Its trajectory with in field will be (a) parabolic (b) circular (c) Hyperbolic (d) Elliptical
7. The K.E of a Particle executing SHM is Maximum when it is (a) at extreme position (b) at Mean Position (c) Midway Between Mean and extreme Position (d) KE remain Constant

## Group-B

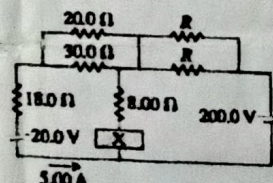
[5x5=25]

8. (a) Explain why spokes are fitted in the cycle wheel. [1]  
(b) A constant torque of 200 Nm turns a wheel about its centre. The moment of inertia about the axis is 100  $\text{kg m}^2$ . Find the angular velocity gained in 4 seconds and the kinetic energy gained after 10 revolutions. [2+2]
9. (a) What is simple pendulum? [1]  
(b) Show that motion of the simple pendulum is angular SHM. [2]  
(c) Derive the relation for time period of simple pendulum. [2]
10. (a) What do you mean by specific charge? [1]  
(b) Describe J.J. Thomson's experiment to determine the specific charge of an electron. [1]  
(c) What is the role of cross-field in J.J. Thomson's experiment? [3]
11. (a) What conditions must satisfy to achieve Simple Harmonic Motion? [1]  
(b) Calculate the total energy of a particle executing simple harmonic motion. [2]  
(c) A body is executing SHM with an amplitude of A. At what displacement from the mean position, its kinetic energy is half of its maximum energy? [2]
12. (a) Show that the path of an electron moving through a transverse uniform electric field is parabolic in nature. [3]  
(b) Electrons are accelerated from rest by a p.d of 100 V. What is their final velocity? [2]

## Group-C

[8x1=8]

13. (a) What is a Wheatstone bridge? Obtain the balanced condition for the bridge. Explain how resistance can be measured by a meter bridge. [1+3]  
(b) In figure, the current in the 20V battery is 5A in the direction shown and the voltage across  $8\Omega$  resistor is 16V, with the lower end of the resistor at higher potential. Find  
(i) the emf (including its polarity) of the battery X.  
(ii) the current  $I$  through the 200V battery.  
(iii) the resistance R. [2+1+1]



Good Luck