

RPET

SAMPLE PAPER 2008

PHYSICS

1. The variation of angular momentum with time for a rigid body rotating about an axis is as shown in the figure.

The torque at $t = 40$ seconds is :

- (1) 1 Joule
- (2) 1 Newton
- (3) Zero
- (4) 0.75 Joule

2. The Pendulum of a grand-father's clock swings 10 cm from side to side per second. Assuming it to be a simple pendulum, show that the peak velocity of the bob (in cm/sec) is nearly :

- (1) 16
- (2) 12
- (3) 8
- (4) 4

3. Ball I having 1 kg mass strikes a glancing blow to another ball II at rest in an elastic collision with a speed of 5m/s. Ball I then moves off at right angle to its initial direction at a speed of 4 m/s. The momentum of ball II after collision in magnitude would be nearly :

- (1) 5
- (2) 6
- (3) 1
- (4) 2

4. For a gm molecule of hydrogen and helium gases two specific heats (C_p and C_v) are found. Choose the correct statement concerning these specific heats:

- (1) The ratio C_p / C_v for both gases is equal
- (2) The ratio C_p / C_v for helium is more than for hydrogen.
- (3) The ratio C_p / C_v for hydrogen is more than for helium
- (4) The difference ($C_p - C_v$) for both is Unequal

5. Two slits are placed 2 mm apart and 300 cm from the screen. When light of 6000 angstroms is used, the bright lines of the interference pattern will be separated by a distance in mm equal to :

- (1) 3.1
- (2) 4.15
- (3) 0.90
- (4) 9.00

6. Two locomotives moving with a speed of 36 km/ hr recede from each other, One of the locomotives whistles with a frequency of 200 Hz. Taking velocity of sound in air to be 340 m/s, the pitch of whistle (in Hz) as heard by an observer in the other locomotive will be :

- (1) 188
- (2) 212
- (3) 200
- (4) 224

7. What is the maximum charge (in coulombs) that can be conveyed to a conducting sphere of diameter 10 cm, if the breakdown voltage of air. is 2×10^6 volts/m ?

- (1) 2.0×10^{-4}
- (2) 5.6×10^{-7}
- (3) 5.6×10^{-2}
- (4) 2.0×10^2

8. In a potentiometer a long uniformly thick resistance wire is used to have

- (1) high resistance of potentiometer
- (2) small heating of the wire
- (3) high potential drop along the wire
- (4) uniform and small potential gradient

9. Voltage of a power line at a given place is 220V. The peak voltage (in volts) will nearly be :

- (1) 440
- (2) 220
- (3) 310
- (4) 345

10. The wave length of first line of the Lyman series of a ten times ionized Na atom ($Z = 11$) is about (the first of the Lyman series for hydrogen is 1216 \AA or $1.216 \times 10^{-7} \text{ m}$) :

- (1) 0.1 \AA
- (2) 10 \AA
- (3) 103 \AA
- (4) 100 \AA