SEAT NUMBER -

Dnyansagar Coaching Classes, A'nagar

Ist Preliminary

Std. - XII	Time - 2 hrs
Sub- Physics-I	Max Marks - 40

Q.1 **Select & write the most appropriate answer from the given alternatives for each sub question.** **8**

1. A particle is moving on a circular path with constant speed which of the following statement about the particle is true?
   a) It is possesses radial acceleration
   b) It possesses radial velocity
   c) It possessess tangential acceleration
   d) It does not possess tangential acceleration
2. According to Kepler's law, the areal velocity of a planet around the Sun always.
   a) increases b) decreases
   c) remains constant d) first increases and then decreases
3. Radias of gyration of a body is independent of its---
   a) mass b) axis of rotation
   c) size of the body d) distribution of mass.
4. The kinetic energy of a particle executing SHM is maximum, when it's displacement is equal to
   a) Zero b) amplitude/4
   c) amplitude/2 d) amplitude
5. In principle the poisson's ratio lies between
   a) -1 & 0.5 b) -1 & 0
   c) -1 & 0.5 d) -1 & +1
6. The reason of capillarity is
   a) viscus force b) surface tension force
   c) force d) Gravitational force.
7. If two waves are of frequencies n_1 = 200 Hz & n_2 = 205 Hz Superimpose then what is the value of beat frequency ?
   a) 6 b) 5
   c) 4 d) 3
8. The amount of energy radiated per second by a body dose not depend upon.
   a) nature of surface
   b) area of surface
   c) mass of the body
   d) temperature difference of the surface and surroundings.

Q.2 **A) Attempt any one.** **2**

1. A particle executing S.H.M. of amplitude 5cm & period of 2s .Find the speed of the particle at a point where its acceleration is half of its maximum value.
2. A sonometer wire of length 0.5 m is streached by a weight of 5 kg. The fundamental frequency of vibration is 100Hz .Determine the linear density of material of wire.

B) Attempt any two. **6**

1. What is banking of roads ? Derive an expression for the maximum speed with which a vehicle can be safely driven along a banked road ?
2. State & proove principle of perpendicular axes.
3. Deduce Boyle's law on the basis of kinetic throry of gases. What is meant by mean free path?

Q.3 A) Attempt any one. **2**

1. Distinguish between transverse & longitudinal waves?
2. What is perfectly black body ? How can it be realised in preactise ?

B) Attempt any two. **6**

1. Explain elastic limit & yield point on a stress strain graph.
2. What is surface energy? Obtain the relation between surface tension & surface energy.
3. Describe in brief an experiment to verify Newton's law of cooling.

Q.4 A) Attempt any two. **4**

1. State the conditions under which a satelight follows.
   (a) Parabolic path (b) an elliptical path
2. Define phase of S.H.M. & angular S.H.M.
3. What are overtones & harmonics?

B) Attempt any one. **4**

1. Define simple pendulum. Show that the period of a simple pendulum does not depend upon it's mass.
2. Describe the melde's experiment to determine the frequency of a tuning fork when arranged in parallel position.

Q.5 Attempt any two.

1. The equation of motion of a body performing S.H.M. is $x = 10 \sin (3\pi t + \frac{\pi}{6})$ m. **4**
   Find it's amplitude, period, frequency and phase constant of the motion.
2. A hot metal sphere cools from 60^0c to 52^0c in 5 minutes and from 52^0c to 44^0 c in the next 7.5 minutes. Determine its temperature after the next 10 minutes. **4**
3. A flywheel of mass 4 kg & radius 10 cm. rotating with a uniform angular velocity of 5 rads is subjected to a torque of 0.01 Nm for 10 seconds. If the torque increases the speed of rotation. Find- **4**
   i) the final angular velocity of flywheel
   ii) the change in its angular velocity
   iii) the change in its angular momentum
   iv) the change in it's kinetic energy.

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