

## Quarterly Examination 2017-2018

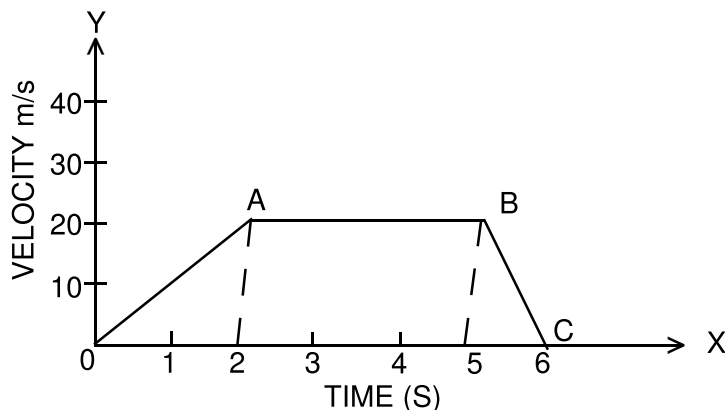
Std. : IX  
Subject : Physics

Full Marks : 80  
Time : 2hrs.+15min

### (Section - A) [40 Marks]

#### (Attempt all questions)

- Q1.** (a) Name the physical quantities which are measured by the following units : [2]  
(i) n m    (ii) torr    (iii) parsec.    (iv) k
- (b) A brass ball is hanging from a stiff cotton thread. Draw a neat labelled diagram showing the forces acting on the brass ball and the cotton thread. [2]
- (c) The distance between two bodies is doubled. How is magnitude of gravitational force between them get affected ? [2]
- (d) Give two differences between speed and velocity. [2]
- (e) A body initially at rest travels a distance 100 m in 5 seconds with a constant acceleration. Calculate the (i) acceleration and (ii) final velocity at the end of 5 seconds. [2]
- Q2.** (a) Name and define the SI unit of pressure. [2]
- (b) Why does a fountain pen leak at high altitude ? [2]
- (c) Why are dust particles removed from a carpet by beating it ? [2]
- (d) State two factors which affect the pressure at a point in a liquid. [2]
- (e) Give two differences between mass and weight. [2]
- Q3.** (a) Study the graph below and answer the questions [4]



Find

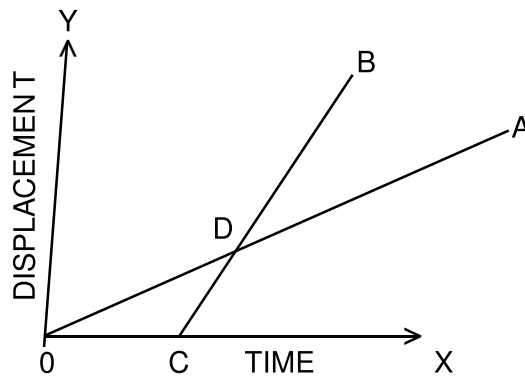
- (i) the distance travelled in the first 2 seconds.
- (ii) the retardation in the last 1 second.
- (iii) State the type of motion in part labelled AB
- (iv) Calculate the distance travelled in part labelled OABC.

- (b) Explain why a gas bubble released at the bottom of a lake grows in size as it rises to the surface of the lake.
- (c) Two bodies A and B of the same mass are moving with velocities  $v$  and  $2v$  respectively. Compare their (i) inertia (ii) momentum (give reasons). [2]
- (d) What do the following indicate in a barometer regarding the weather.
- (i) sudden fall in the mercury level.
- (ii) gradual rise in the mercury level. [2]

- Q4.** (a) Give an example of a non-contact force which is always attractive in nature. How does the magnitude of this non-contact force on the two bodies depend on the masses of the two bodies ? [2]
- (b) How is the barometric height of a simple barometer affected if (i) the tube is slightly tilted from the vertical (ii) a drop of water is inserted inside the tube : [2]
- (c) State and define the principle of a hydraulic press. [2]
- (d) A pebble thrown vertically upward with an initial velocity of  $50\text{m/s}$  comes to rest in 5 seconds. Find the retardation. [2]
- (e) Is it possible to have an accelerated motion with a constant speed ? Name such type of motion and give one example. [2]

**(Section - B) [40 Marks]**  
**(Attempt any four questions)**

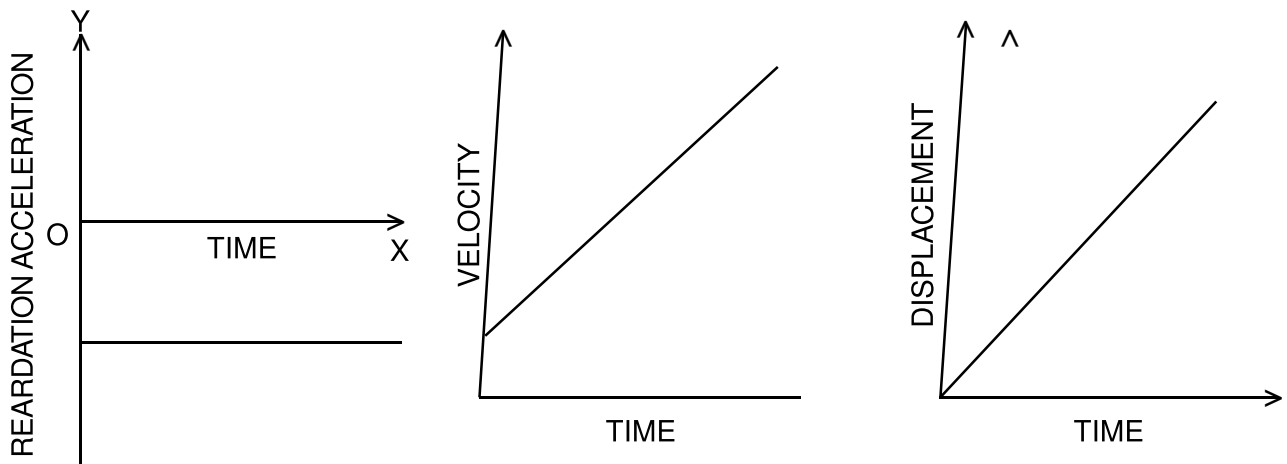
- Q5.** (a) The figure shows a displacement time graph of two vehicles A and B moving along a straight road.



- (i) Which vehicle moves faster ? Give a reason.
- (ii) Which vehicle starts later ? Give a reason.
- (iii) Do the vehicles meet ? Give a reason. [3]
- (b) A body moves from rest with a uniform acceleration and travels  $270\text{m}$  in 3 seconds. Find the velocity of the body at 10 seconds after the start. [3]
- (c) A block of wood floats on water with  $\frac{2}{5}$  th of its volume above the water surface. Calculate the density of wood. (density of water  $1\text{g/cc}$ ) [4]

**Q6.** (a) Identify the type of motion from the following.

[3]



(b) A ball is thrown vertically upwards. It returns 6 seconds later. Calculate (i) the greatest height reached by the ball and (ii) the initial velocity of the ball. (Take  $g = 10\text{m/s}^2$ ). [3]

(c) A block of wood is so loaded that it just floats in water at room temperature. What change will occur in the state of floatation if [4]

- (i) some salt is added to water.
- (ii) water is heated. (give reason)

**Q7.** (a) (i) Is pressure is scalar or vector quantity ?

(ii) How is pascal related to the fundamental unit ? [1+2]

(b) A body is dropped freely under gravity from the top of a tower of height 78.4 cm. Calculate:

- (i) the time taken to reach the ground.
- (ii) the velocity with which it strikes the ground  $g=10\text{m/s}^2$  [3]

(c) (i) Why do sea divers need special protective suits ?

- (ii) How does the liquid pressure on the diver change if (i) the diver moves to a greater depth.
- (ii) the diver moves horizontally. [2+2]

**Q8.** (a) (i) Is density a scalar or vector quantity ? [1]

(ii) Derive the relation between the SI and CGS unit of density. [2]

(b) A solid weighs 120gf in air and 105 gf when it is completely immersed in water. Calculate the relative density of the solid. [3]

(c) At a given place, a mercury barometer records a pressure of 0.70m of Hg. What would be the height of water column if the mercury in the barometer is replaced by water ?

$G_{\text{Hg}} = 13.6 \times 10^3 \text{Kg/m}^3$  [4]

- Q9.** (a) (i) State Archimedes principle.  
(ii) It is easier to lift a heavy stone under water than in air. Explain. [1½+1½]
- (b) Differentiate between scalar and vector quantities. Give one example of each. [1½+1½]
- (c) A block of iron floats on mercury. Find the fraction of volume which remains immersed in mercury. (Densities of iron and mercury are 7.8 g/cc and 13.6g/cc respectively) [4]
- Q10.** (a) A cube of each side 5cm is placed inside a liquid. The pressure at the centre of one face of the cube is 20Pa. Calculate the thrust exerted by the liquid on this face. [3]
- (b) (i) State the factors on which the magnitude of upthrust on a body due to a liquid depends. [2]  
(ii) At which point is upthrust considered to act. [1]
- (c) The diameter of the neck and bottom of a bottle are 2cm and 10cm respectively the bottle is completely filled with oil. If the cork in the neck is pressed in with a force of 4.1 kgf, what force is exerted on the bottom of the bottle. [4]