

Quarterly Examination 2018-2019

Physics

Class : IX

Time : 2 hrs.+15min Reading Time

Full Marks : 80

Section-A [40 Marks]

Attempt are questions from this section.

Question-1

[2x5]

- What is the least count of a (i) vernier callipers (ii) standard laboratory micrometer screw gauge.
- A stop watch has 10 divisions graduated between the 0 and 5s. marks. What is its least count.
- The radius of a sphere is 1.945 cm. If the vernier has a negative error of 0.04 cm, calculate the corrected radius of sphere.
- Name two non-metric units of length which are bigger than a metre. How are they related to the metre.
- Name the any four fundamental qualities along with their units in S.I. system.

Question-2

[2x5]

- Define SI unit of pressure.
- The normal pressure of air is 76 cm of mercury. Calculate the pressure in SI units.
[Density of mercury = 13600 kg/m^3 and $g = 10 \text{ ms}^{-2}$]
- Why does nose start bleeding on high mountains.
- How does the pressure exerted by a solid and a fluid differ.

{Turn Over}

- (e) Name and state the principle on which the hydraulic brakes of a car work.

Question-3

[2x5]

- (a) Give an example of motion in which average speed is not zero, but the average velocity is zero.
- (b) Draw a displacement-time graph for a boy going to school with a uniform velocity.
- (c) Differentiate between heat and temperature. [any 2 diff.]
- (d) Name two substances which contract on heating.
- (e) Calculate the weight of a body of mass 10 kg in
(i) kgf and (ii) newton Take $g = 9.8 \text{ ms}^{-2}$

Question-4

[2x5]

- (a) (i) Explain the meaning of the following statement '1 kgf = 9.8 N'
- (ii) How are g and G related.
- (b) Two pendulums P and Q have equal lengths but their bobs weigh 10gF and 20gF respectively.
- (i) Compare their time periods.
- (ii) Give a reason for your answer.
- (c) Define uniform acceleration and give an example of a body having this motion.
- (d) Explain why it is easier to cut with a sharp knife than with a blunt one.
- (e) If I travel from Mumbai to Pune (150 km) in $2\frac{1}{2}$ hrs. via the

Express Highway and return to Mumbai via the old Highway (180 km) in $3\frac{1}{2}$ hrs., calculate the average velocity during the entire journey.

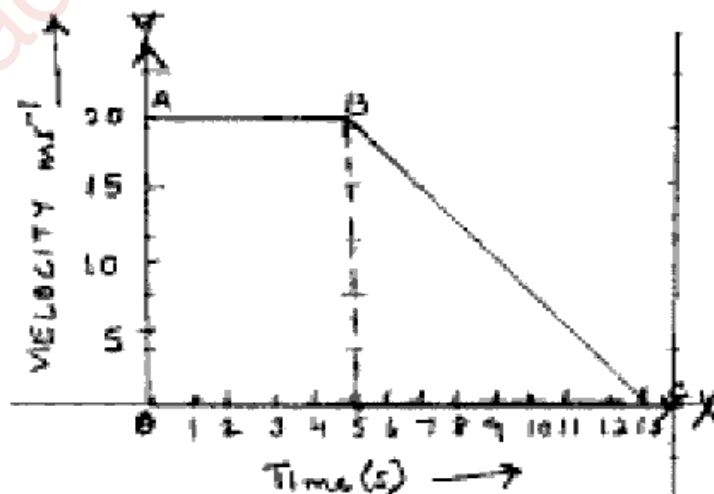
Section-B [40 Marks]

Attempt any four questions from this section.

Question-5

[3+3=4]

- (a) A cricket player holds a cricket ball of mass 100g by moving his hands backward by 0.75 m. If the initial velocity of the ball is 108 kmh^{-1} , find the retarding force applied by the player.
- (b) (i) How does the magnitude of non contact force on the two bodies depend on the distance of separation between them.
- (ii) How is the gravitation force of attraction between two masses affected if the separation between them is doubled.
- (c) A car travels with a uniform velocity of 20 ms^{-1} for 5s. The brakes are then applied and the car is uniformly retarded. It comes to rest in further 8s. Find :



{Turn Over}

- (i) the distance travelled in first 5s,
- (ii) the distance travelled after the brakes are applied.
- (iii) total distance travelled, and
- (iv) acceleration during the first 5s and last 8s.

Question-6

[3+3=4]

- (a) State three factor on which the pressure at a point in a liquid depends.
- (b) The area of pistons in hydraulic machine are 6cm^2 & 576cm^2 . What force on the smaller piston will support a load of 1152 N on the larger piston ?

State the assumption made in the above calculation

- (c) How does the liquid pressure on a diver change if :
 - (i) the diver move to the greater depth, and
 - (ii) the diver moves horizontally ?
 - (iii) calculate the equivalent height of a water barometer, if the pressure recorded by mercury barometer is 60 cm of mercury. Density of mercury is 13600kgm^{-3} and density of water is 1000kgm^{-3} .

Question-7

[3+3+4]

- (a) (i) Name the physical quantities which are measured in the following units :
ly ; ns ; Nm^{-2} , micron
- (ii) The wavelenth of light of a particular colour is 5920\AA . Express it in nanometre and metre.

- (b) State how does the time period of a simple pendulum depend on (i) mass of b of (ii) length of pendulum (iii) acceleration due to gravity.
- (c) The thimble of a screw gauge has 50 divisions. The spindle advances 2 mm when the screw is turned through four revolutions.
- (i) what is the pitch of screw gauge ?
- (ii) what is the least count of the screw gauge ?

Question-8

[3+4+3]

- (a) (i) Draw a diagram showing the temperature of various layers of water in an ice-covered pond.
- (ii) Name the phenomenon responsible for these temperatures mentioned in part (i)
- (b) (i) Name the C.G.S. and S.I. units of heat and how is the S.I. unit related to the unit calorie.
- (ii) At what temperature the density of water is maximum? State its value.
- (c) (i) A stone thrown vertically upwards, takes 4s to return to thrower. Calculate (i) initial velocity of the stone. [2+1]
- (ii) Maximum height attained by stone. [Take $g = 10\text{ms}^{-1}$]

Question-9

[3+3+4]

- (a) Explain the motion of a man on ground with the help of Newtons' third law.
- (b) (i) Name the two factors on which the force needed to stop a moving body in a given time, depends.

{Turn Over}

- (ii) Two balls A and B of masses m and $2m$ are in motion with velocities $2v$ and v respectively compare their inertia and momentum.
- (c) A car is moving with a uniform velocity 30ms^{-1} . It is stopped in 2s by applying a force of 1500 N through its brakes. Calculate : (i) the change in momentum of car (ii) the retardation produced in car (iii) the mass for car.

Question-10

- (a) In a vernier callipers 19 main scale divisions coincide with 20 vernier scale divisions. If the main scale has 20 divisions in a centimetre, calculate the least count when the two jaws are in contact, the zero of vernier scale is ahead of zero of main scale and 3rd division of vernier scale coincides with a main scale division. Find the zero error of the vernier callipers.
- (b) The pressure in water pipe on the ground floor of a building is 40000 pascals where as on the first floor its' $10,000$ pascals. Find the height of the first floor. [$g = 10\text{ms}^{-2}$]
- (c) What do the following indicate in a barometer regarding weather :
- (i) gradual fall in the mercury level,
 - (ii) sudden falling the mercury level,
 - (iii) gradual rise in the mercury level ?