

- iii. R.D. of material of the body
- c. A metal cube of 5cm edge and R.D. 7.5, is suspended by a thread in a liquid of density 1.2, such that it is completely immersed in liquid. Find the tension in thread.

Question 10 (3+3+4)

- a. i. The R.D. of silver is  $10^8$ . Find its density
- ii. Differentiate between density & relative density of a substance.
- b. i. A cell of potential difference 12V is connected to a bulb. The resistance of filament of bulb when it glows, is  $24\Omega$ . Find the current drawn from the cell.
- ii. 'The resistance of a wire is 1 ohm'. Explain the meaning of this statement.
- c. A wooden block floats in water with two third of its volume submerged
- i. Calculate density of wood
- ii. When the same block is placed in oil, three quarters of its volume is immersed in oil. Calculate density of oil.

## Half Yearly Examination - 2018-19

### Physics

Class : IX

Time : 2 Hrs. + 15 min. reading time

Full Marks : 80

(Section A - 40 marks)

(2x5)

(Attempt all questions from this Section)

Question 1

- a. Name the physical quantities which are measured in the following units :
- i. pascal    ii.  $\text{Kg m}^{-1}\text{s}^{-2}$     iii. coulomb    iv.  $\text{JC}^{-1}$
- v.  $\text{VA}^{-1}$     vi. calorie    vii. erg    viii. kelvin
- b. A person standing on an oscillating swing, sits down. How does the time period of swing get affected? What happens to its frequency of oscillation
- c. The length of a second's pendulum 100 cm. Find the length of another pendulum whose time period is 2.4 sec.
- d. The circular scale of a screw gauge has 50 divisions. Its spindle moves by 2 mm on sleeve scale, when given four complete revolutions. Calculate
- i. pitch    ii. least count
- e. Explain why big boulders are carried by fast moving rivers, over hundreds of kilometers.

Question 2

- a. Which of the following solar radiations pass through the atmosphere of the earth :
- x rays, ultraviolet rays, visible light rays, infrared radiation

Question 4

- a. Explain why icebergs floating in sea are dangerous for ships.
- b. State whether upthrust will increase or decreases if
  - i. the volume of solid increases
  - ii. the density of liquid in which solid is immersed decreased.
- c. Calculate the resistance of a conductor, if 1 mA current flows through a conductor when a potential difference of 2 volt is applied across its ends.
- d. Write symbols and state functions of each of following components in an electric circuit
  - i. rheostat
  - ii. voltmeter
- e. State and define the S.I. unit of current

SECTION B (40 Marks)

Attempt any four questions from this Section

Question 5 (3+3+4)

- a.
  - i. How can a temperature in degree celcius be converted into S.I. unit of temperature.
  - ii. Name the factor on which the heat flow between two bodies depends - quantity of heat or temperature difference
- b. State the law which governs the energy flow in an ecosystem
- c.
  - i. State the volume changes observed when a given mass of water is heated from  $0^{\circ}\text{C}$  to  $10^{\circ}\text{C}$ . Sketch a temperature - volume graph to show the behaviour.

- ii. Why are soft drink bottles not filled completely?

Question 6 (3+3+4)

- a.
  - i. What is responsible for the flow of current through a metallic conductor, an electrolyte
  - ii. How much is the charge on an electron?
- b.
  - i. How is the current flowing in a conductor changed if the resistance of conductor is doubled keeping the potential difference across it the same
  - ii. How is the resistance of a wire affected if its length is doubled, radius is doubled.
- c. A conductor carries a current of 0.2A
  - i. Find the amount of charge that will pass through the cross section of conductor in 30 sec.
  - ii. How many electrons will flow in this time interval.

Question 7 (3+3+4)

- a.
  - i. How much longer is a multimetre then a nanometre
  - ii. Express 5 parsec in light years
- b.
  - i. When a golf ball is lowered into a measuring cylinder containing water, the water level rises by  $40\text{ cm}^3$  when the ball is completely submerged. If the mass of ball in air is 44 gm, calculate its density
  - ii. A kg sheet of tin sinks in water but if the same sheet is converted into a boat it floats, give reasons.
- c.
  - i. A body is fully immersed in water to a depth of 2m, 4m and then 5m, in turn. Will the loss in its weight be equal or different in three cases? If different, in which case will it be least.

- b. State the effect of global warming in coastal region.
- c. Name any one nuclear power plant in India. State any one disadvantage of using nuclear energy for producing electricity
- d. Explain why a hollow glass sphere which floats with its entire volume submerged in water at  $4^{\circ}\text{C}$ , sinks when water is heated above  $4^{\circ}\text{C}$ .
- e. Temperature of two bodies differ by  $1^{\circ}\text{C}$ . How much do they differ in Fahrenheit scale?

#### Question 3

- a. Give an example to explain that the use of modern eco-friendly technologies is more efficient and less polluting.
- b. What amount of work is needed in moving  $2\text{C}$  charge through a potential difference of  $8\text{v}$ .
- c. Two conductors A and B are joined by a copper wire. State the direction of flow of electrons in each of the following cases :
  - i. If A is negatively charged & B is uncharged
  - ii. If A is positively charged & B is negatively charged.
- d. A man first swims in sea water and then in river water.
  - i. Compare the weights of seawater and river water displaced by him.
  - ii. Where does he find it easier to swim and why?
- e. A body whose volume is  $150\text{ cm}^3$ , weighs  $1200\text{ gf}$  in air. Calculate its weight in water.

- ii. Why is it difficult to hold a school bag having a strap made of a thin and a strong string?

#### Question 8

- a.
  - i. A sphere of iron and another of wood, both of same radius are held under water. Compare the upthrust on the two spheres
  - ii. If both are placed on the surface of water, state which of the two will sink? Give reason to your answer.
- b. A body weighs  $20\text{ gf}$  in air,  $18.2\text{ gf}$  in a liquid and  $18.0\text{ gf}$  in water. Calculate :
  - i. R.D. of solid    ii. R.D. of liquid
- c.
  - i. For a floating body, how are its weight  $W$  and upthrust  $F_B$  related
  - ii. A body of weight  $W$  is floating in a liquid. What will be its apparent weight.
  - iii. A body floats in a liquid A of density  $P_1$  with part of it submerged inside liquid while in liquid B of density  $P_2$  totally submerged inside liquid. How are the densities related?
  - iv. Why is floating ice less submerged in brine than in water.

#### Question 9

- a. 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 water is heated. Give reason.
- b. A body weighs  $W\text{gF}$  in air and  $W_1\text{gF}$  when it is completely immersed in water. Find :
  - i. volume of the body
  - ii. upthrust on the body