

## 10<sup>th</sup> ICSE Physics Mock Test 3

### SECTION-I (40 Marks)

1.
  - (a) How do we calculate work done when force is variable?
  - (b) Define Radioactivity?
  - (c) Calculate the power of a motor which can pump up 2000 litres of water to a height of 15 m in 5 minutes ( $g = 10 \text{ ms}^{-2}$ ).
  - (d) State the Law of levers.
  - (e) What is the ideal mechanical advantage of a single movable pulley? Obtain the result (10)
  
2.
  - (a) Draw separate diagrams to show refraction of light from (i) air to glass and (ii) glass to water. Label it.
  - (b) Comment on the statement The refractive index of water is  $\frac{4}{3}$ .
  - (c) A coin lies at the bottom of a trough in which the height of water  $\left(\mu = \frac{4}{3}\right)$  is 15 cm. Find out how much it seems to be raised from the bottom.
  - (d) The magnification of an object placed in front of a convex lens of focal length 20 cm is +2. To obtain a magnification of - 2, by what distance the object will have to be moved
  - (e) State three actions that a total reflecting prism can produce. (10)
  
3.
  - (a) Arrange the following electromagnetic waves in the order of their increasing wavelength. X-rays, infrared rays, radio waves, y-rays and microwaves.
  - (b) State two factors on which velocity of a longitudinal wave in a medium depends.
  - (c) Explain the term simple harmonic motion.
  - (d) Specific latent heat of fusion of lead is  $27 \times 10^3 \text{ kg}^{-1}$ . What do you understand by the statement?
  - (e) Why does weather become pleasant when it starts freezing in cold countries? (10)
  
4.
  - (a) How does the resistivity of (i) a metallic wire, (ii) semiconductor, (iii) an alloy such as constantan, depend on temperature?
  - (b) A current of 1.2 A flows through a conducting wire for 5 minutes. How many electrons will flow?
  - (c) Why radium painting consisting of zinc sulphide and a trace of radium salt, glows in the dark?
  - (d) What a change will you expect to take place in the nucleus of an atom if it emits:
    - (i)  $\alpha$ -radiations only,
    - (ii)  $\beta$ -radiations only,
    - (iii)  $\gamma$ -radiations only.
  - (e) The nucleus of an element X which has a symbol  ${}_{92}^{235}\text{X}$  emits  $\alpha$  and  $\beta$  radiations. The final nucleus is  ${}_a^b\text{Y}$ . Find 'a' and 'b'.

(10)

**SECTION-II (40 Marks)**

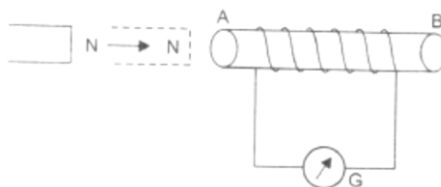
5. (a) A boy lifts 400 N through a vertical height of 5 m in 10 seconds by a fixed pulley by applying an effort of 480 N at the other end. Find: (i) Velocity ratio, (ii) M.A., (iii) Efficiency, (iv) Energy gained by the load, (v) Power developed by the boy, (vi) The justification of using the pulley?  
 (b) Plot a graph of KE Vs momentum for constant mass and KE Vs mass for constant momentum  
 (c) Define centripetal force and how is it different from centrifugal force. Are they action & reaction. (10)

6. (a) How does the angle of deviation produced by a prism depend on the angle of incidence of light at the prism surface? Draw a graph for it. Explain why there are 2 angles of incidence for a single value of angle of deviation  
 (b) A monochromatic ray of light traveling from water strikes the surface of a transparent medium at an angle of incidence  $60^\circ$  and gets refracted into the medium at an angle of refraction  $45^\circ$ . What is the refractive index of the medium?  
 (c) How will you investigate the existence of radiation beyond the red and violet extremes of the spectrum? (10)

7. (a) What do you understand by damped vibrations? Give one example and draw a displacement-time graph to illustrate them.  
 (b) (i) An electromagnetic wave has a frequency of 500 MHz and a wavelength 60 cm. Calculate the velocity of the wave. Name the medium through which it is travelling.  
 (ii) What will be its velocity in a medium whose refractive index is 2.0.  
 (c) With which of the following frequencies does a tuning fork of 256 Hz resonate?  
 288 Hz, 314 Hz, 250 Hz, 333 Hz, 512 Hz. (10)

8. (a) 0.5 kg of lead at  $327^\circ\text{C}$  is cooled at  $27^\circ\text{C}$ , when it gives off 22,500 calories of energy. Calculate the specific heat capacity of lead in  
 (i) Calories (ii) Joules.  
 (b) What is the effect of increase in pressure on the melting point of ice and boiling point of water?  
 (c) (i) Which contains more heat 1 gm of water or 1 gm of steam at  $100^\circ\text{C}$ ?  
 (ii) Which contains more heat 1 gm of ice at  $0^\circ\text{C}$  or 1 gm of water at  $0^\circ\text{C}$ ? (10)

9. (a) The diagram shows a coil connected to a centre zero galvanometer G. The galvanometer shows a deflection to the right when the N-pole of a powerful magnet is moved to the right as shown below:



- (i) Explain why the deflection occurs in the galvanometer?  
 (ii) Does the directions of the current on the coil appear clockwise or anticlockwise when viewed from end A?  
 (iii) State the observation in G when the coil is moved away from N.  
 (iv) State the observation in G when the coil and the magnet are moved to the right at the same speed.  
 (b) (i) State three factors on which the magnitude of force on a current carrying conductor placed in a magnetic field depends.  
 (ii) Under what condition a current carrying conductor placed in a magnetic field experiences no force?  
 (c) What are the causes of energy losses in a transformer? (10)