



Federal Board HSSC-I Examination Physics Model Question Paper

Time allowed: 2.35 hours

Total Marks: 68

Note: Sections 'B' 'C' and 'D' comprise pages 1-2 and questions therein are to be answered on the separately provided Answer Book. Use supplementary answer sheet i.e., sheet B if required. Write your answers neatly and legibly.

SECTION – B (Marks 21)

(Chapters 1 to 5)

- Q.2 Attempt any SEVEN parts. All parts carry equal marks. (7 × 3 = 21)
- i. Show that the famous Einstein's equations $E = mc^2$ is dimensionally consistent.
 - ii. Give the draw backs to use the period of a pendulum as a time standard.
 - iii. Under which circumstances would a vector shall have components of same magnitude?
 - iv. Explain briefly why buses and heavy trucks have large steering wheels?
 - v. What is Head-on Collision? Explain briefly with an example.
 - vi. What is the angle of projection for a projectile for which the maximum height reached and corresponding range are equal?
 - vii. Does a hydrogen-filled balloon possess P.E? Explain briefly.
 - viii. A bucket is taken to bottom of a well; does the bucket possess any P.E? Explain briefly.
 - ix. Why the fly wheel of an engine is made heavy at the rim?
 - x. A ball is just supported by a string without breaking. If it is set swinging, it breaks. Why?

SECTION – C (Marks 21)

(Chapters 6 to 10)

- Q.3 Attempt any SEVEN parts. All parts carry equal marks. (7 × 3 = 21)
- i. Why a sports car has oblong shape design?
 - ii. Describe the working of an engine carburetor.
 - iii. Give two applications from daily lives of phenomenon in which resonance plays an important role.
 - iv. What will be the frequency of a simple pendulum if its length is 1m?
 - v. What are the conditions for constructive and destructive interference?
 - vi. How one can locate the position of nodes and anti-nodes in a vibrating string?
 - vii. Can we apply Huygens Principle to radar waves? Explain briefly.
 - viii. How you can explain Brewster's Law of Polarization?
 - ix. What are the conditions for a process to be reversible?
 - x. Entropy has often called as "times arrow". Explain briefly.

SECTION – D (Marks 26)

Note: Attempt any **TWO** questions. All questions carry equal marks. (2 × 13 = 26)

- Q.4 a. Prove that Absolute $P.E = \frac{GmM_e}{R_e}$ (8)
- b. A man whose mass is 70 kg walks up to the third floor of a building which is 12 m above the ground in 20 Sec. Find his power in watts and hp. (5)
- Q.5 a. Derive equation for kinetic and potential energy of a body executing S.H.M for a mass-spring system. (8)
- b. What should be the length of a simple pendulum whose time period is one second? What is its frequency? (5)
- Q.6 a. Describe the experimental arrangement for the production of interference fringes by young's double slit method, and get an expression for the fringe spacing. (8)
- b. In a certain X-rays diffraction experiment the first order image is observed at an angle of 5° for a crystal plane spacing of 2.8×10^{-10} m. What is the wave length of X-ray used? (5)
-