

Time Allowed: 2.40 Hours"Section - B"Marks: 32

Q-2. Write short answers to any eight (8) of the following parts. All parts carry equal marks:-

- (i) Define longitudinal waves. Give three examples.
- (ii) Why sound produced by simple pendulum is not heard?
- (iii) What is speed of light in water having index of refraction as 1.33?
- (iv) Are rearview mirror used in cars concave or convex?
- (v) Normally objects with large number of electrons are electrically neutral why?
- (vi) What is electrical resistance? Write any three factors on which it depends?
- (vii) Define mutual induction and write its unit.
- (viii) Differentiate between analogue and digital electronics.
- (ix) A sound wave of wave length $1.7 \times 10^{-2} \text{m}$ is travelling with velocity of 343.4 m/s calculate the frequency of sound.
- (x) How electrostatic painting is better than conventional spray painting?
- (xi) Draw truth table and symbol of "NAND" and "OR" gates.

"Section - C"Marks: 21

Note: Answer any three (3) questions. All questions carry equal marks:-

- Q-3. (a) Show that mass spring system execute simple harmonic motion.
- (b) A mass hung from a spring vibrates 15 times in 12S. Calculate the frequency and time period of vibration.
- Q-4. (a) Derive spherical mirror formula ($\frac{1}{f} = \frac{1}{p} + \frac{1}{q}$).
- (b) A 1.50cm high object is placed 20cm from a concave mirror with radius of curvature 30cm find the position of image formed
- Q-5. (a) Explain the force on a current carrying coil in a magnetic field.
- (b) A 1.5cm long wire carries a current of 5A at right angle to a uniform magnetic field of magnitude 0.04T. Calculate the force exerted on the wire.
- Q-6. (a) Describe the construction and working of electron gun.
- (b) What are the algebraic Boolean expressions to represent the output of "AND" "OR" "NAND" and "NOR" gates.