

Note: Time allowed for section B and C is 2 hours and 40 minutes.

SECTION "B"

Marks: 32

II. Attempt any EIGHT Parts out of the following. Each Part carries equal marks.

- i. Why waves refract at the boundary of shallow and deep water?
- ii. What is the speed of sound in air at -20°C .
- iii. In which medium air (or) water an echo is heard sooner? Why?
- iv. Describe the term loudness, pitch and quality. Explain each by giving an example.
- v. Are rearview mirrors used in cars concave or convex?
- vi. The Sum of charges on both plates of a capacitor is zero. What does a capacitor store?
- vii. State and explain Ohm's law?
- viii. Differentiate between step-up and step-down transformers?
- ix. What is the function of an accelerating anode in an electron gun?
- x. How a flash drive is different from other storage devices?
- xi. If nuclear radiation is harmful. How it can be used for treatment diseases.

SECTION "C"

Marks: 21

Note: Attempt any THREE questions of the following. Each question carries equal Marks.

- III. (a) Using ripple tank explain reflection, refraction and diffraction of waves.
(b) Water waves with wavelength 2.8m, produced in a ripple tank, travel with a speed of 3.80m/s. what is the frequency of the straight vibrator that produce them.
- IV. (a) What is total internal reflection? How we can calculate the critical angle for total internal reflection? What are the conditions for total internal reflection?
(b) Explain the force on a current carrying wire in a magnetic field?
- V. (a) Describe the working principal of cathode Ray Oscilloscope (CRO) and make list of its uses.
(b) What is email and internet? List few uses of internet in daily life.
- VI. (a) What are radioisotopes? Explain their three uses for various applications?
(b) Iodine-131 is an important radioisotope for medical diagnostic and treatment procedures. The half life of ^{131}I is 8.02 days. Out of 100g of the sample how much will be left after 24 days.