

Roll No. : _____

Code No. : 4202-B

ENGLISH VERSION

APPLIED PHYSICS-II

Time Allowed : 3:00 Hours

Maximum Marks : 60

Notes: (i) Attempt all questions.

(ii) Students are advised to specially check the numerical data of question paper in both versions. If there is any difference in Hindi translation of any question, the students should answer the question according to the English version.

(iii) Use of Pager and Mobile Phone by the students is not allowed.

PART-A

(Objective Type Choice Questions)

Q.1. Attempt **any ten** questions. Each question carries equal marks.

[10×1=10]

- (i) Which one of the following is not the characteristic of a wave?
- (a) Wavelength (b) Phase
(c) Frequency (d) Medium
- (ii) It is possible to observe total internal reflection when light travels from :
- (a) Air to Water (b) Air to Glass
(c) Water to Glass (d) Glass to Water
- (iii) 1 Electron volt is equal to :
- (a) 2×10^{-18} joule (b) 1.5×10^{-19} joule
(c) 1.6×10^{-19} joule (d) 2.4×10^{-19} joule
- (iv) In metals, the electric conduction is due to which particles?
- (a) Ion (b) Electron
(c) Proton (d) All of these

Fill in the blanks with suitable word/words :

- (v) Kirchhoff's second law deals with conservation of (charge/energy/potential)
- (vi) To form p-type semiconductor, a impurity element is added. (trivalent/tetravalent/Pentavalent)
- (vii) The light emitted from a LASER is typically..... (monochromatic/dichromatic/polychromatic)
- (viii) Unit of specific conductance is (ohm/ohm-metre/ohm⁻¹ metre⁻¹)

One Word/One Sentence Question

- (ix) What is essential for sound wave propagation?
- (x) Which wire thin or thick has less resistance?
- (xi) Which instrument is used to measure current in a circuit?
- (xii) Write the unit of specific resistance.

PART-B**(Very Short Answer Type Questions)****Note :** Answer **any five** of the following questions. Each question carries equal marks.

[5×2=10]

- Q.1 Define Ultrasonic Waves.
 Q.2 Write Snell's Law.
 Q.3 Write the name of the phenomenon in which nature of light resembles that of a wave.
 Q.4 Write the minimum possible value of electric charge.
 Q.5 Write the SI unit and dimension of electric charge.
 Q.6 Write Lenz's law.
 Q.7 What is Semiconductor? Give two names for example.

PART-C**(Short Answer Type Questions)****Note :** Answer **any eight** of the following questions. Each question carries equal marks. [8×2½=20]

- Q.1 Give the differences between ordinary light and LASER beam.
 Q.2 Write the formulae for velocity and acceleration of a particle executing simple harmonic motion in terms of displacement(y).
 Q.3 What is the basic reason for refraction? Write the formula of relationship between critical angle(c) and refractive index(μ).
 Q.4 What do you mean by quantization of electric charge?
 Q.5 Define Wheatstone's Bridge. Draw a circuit diagram of it.
 Q.6 Write Biot-Savart law.
 Q.7 Draw diagram of series combination of capacitors. Write also the formula of their equivalent capacitance.
 Q.8 What is Transistor? Mention their types. Give their symbolic representation.
 Q.9 What is LASER? What are the characteristics of LASER?
 Q.10 Write the conditions of total internal reflection.

PART-D**(Descriptive and Narrative Type Questions)****Note :** Answer **any four** of the following questions. Each question carries equal marks.

[4×5=20]

- Q.1 What is meant by Oscillatory Motion? In SHM 'a' and 'y' are amplitude and displacement. In which positions is the total energy wholly kinetic or wholly potential? State by formulae.
 Q.2 Two capacitors of $5\ \mu\text{F}$ each are connected in parallel. This parallel combination is further connected in series with $10\ \mu\text{F}$ and $20\ \mu\text{F}$. Calculate the total capacitance of the circuit.
 Q.3 Define Electric Flux. Write its SI unit. State the Gauss law of electrostatics.
 Q.4 Define Potential difference and Electric potential. State and define their SI units.
 Q.5 With a circuit diagram, explain briefly how a meter-bridge can be used to find the resistance of a given wire? Write the formula used.
 Q.6 Describe the formation of a p-n junction diode. Explain the formation of depletion region and potential barrier.

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