

Seat No. 

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मक्षिका - 004

## Engineering Physics - II (102111)

P. Pages : 3

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** subquestions from each unit.
5. Assume suitable data wherever necessary and state the assumptions made.
6. Diagrams/ sketches should be given wherever necessary.
7. Use of logarithmic table, drawing instruments and nonprogrammable calculator is permitted.
8. Figures to the right indicate full marks.

### UNIT - I

1. a) State the requirements of acoustically good hall and Explain the factors affecting architectural acoustics and it's remedies. 8
- b) i) State the following terms: 4
  - a) Limits of audibility
  - b) Piezoelectric effect
  - c) Sabine's formula
  - d) Acoustic intensity
- ii) Calculate the length of iron rod which can be used to produce ultrasonic waves of 40 kHz. [Given, Density of iron =  $7.23 \times 10^3 \text{ kg/m}^3$  Young's modulus  $Y = 11.6 \times 10^{10} \text{ N/m}^2$ ] 4
- b) i) State the applications of ultrasonics. 4
- ii) Calculate resultant intensity level in dB when 70 dB sound is added to 80 dB sound. 4

### UNIT - II

2. a) Define Hysteresis, draw hysteresis curve and state the properties, applications and examples of soft magnetic and hard magnetic materials. 8



- b) i) What are matter waves ? State it's properties and dissimilarities between matter wave and EM-waves. 4
- ii) Calculate the lowest energy level in eV and momentum of electron when trapped in a rigid box of width  $1 \text{ \AA}$ . 4
- c) i) State Heisenberg's uncertainty principle and give it's illustration by electron diffraction experiments. 4
- ii) An electron at rest is accelerated through a potential difference of 100 Volt. Calculate. 4
- a) Velocity of electron.
- b) Phase velocity.
- c) De-Broglie's wavelength.

**UNIT - V**

5. a) What are nanomaterials ? Explain in brief any four properties of nanomaterials. 8
- b) What are various methods of synthesis of nanomaterials and explain chemical vapour deposition method. 8
- c) i) State the applications of nanomaterials. 4
- ii) What are advantages of nanomaterials. 4

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