

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Bachelor of Technology (Computer Engineering) SEMESTER - 2 Summer 2026 (Regular)

Course :Bachelor of Technology (Computer Engineering) Branch : Engineering and Technology

Semester : SEMESTER - 2

Subject Code & Name: 24AF1PHYBS202 - ENGINEERING PHYSICS

Time : 3 Hours]

[Total Marks : 60

Instructions to the Students:

1. Each question carries 12 marks.
2. Question No. 1 will be compulsory and include objective-type questions.
3. Candidates are required to attempt any four questions from Question No. 2 to Question No.6
4. Use of non-programmable scientific calculators is allowed.
5. Assume suitable data wherever necessary and mention it clearly.

Q1. Objective type questions. (Compulsory Question)

12

- 1 The wavelength of the Ultrasonic waves is of the order of.....
a) 0.0175 m b) 0.175 m c) 0.00175 cm d) 1.75 m
- 2 The standard unit of the sound absorption coefficient is,
a) Decibel b) Watt c) Sabine d) Hertz
- 3 Specific rotation is measured using,
a) Spectrometer b) Polarimeter c) Telescope d) Microscope
- 4 Wavelength of He-Ne LASER is.....
a) 6943 Å b) 6328 Å c) 6493 Å d) 6349 Å
- 5 The fundamental unit of information in quantum computing is,
a) qubit b) bit c) byte d) quantum byte
- 6 The de- Broglie wavelength associated with a particle of mass m moving with velocity v is
a) hmv b) h/mv c) mv/h d) 1/hmv
- 7 The nearest neighbor distance in the case of BCC structure is,
a) $a/\sqrt{2}$ b) a c) $a\sqrt{3}/2$ d) $a\sqrt{3}/4$
- 8 The Miller indices of the plane parallel to the X-axis and Y-axis are ,
a) (100) b) (010) c) (001) d) (111)
- 9 In case of radioactive element, the radiations emitted by alpha particles are _____
a) Positively charged particles b) Negatively Charged particles
c) Neutral d) Photons
- 10 The phenomenon of sudden disappearance of electrical resistance at certain low temperatures is,
a) Superconductivity b) Coercivity c) retentivity d) both b & c
- 11 Semiconductors are used in,
a) Zener Diode b) LED c) Photovoltaic cell d) all of the above

- 12 FESEM stands for ____
- a) Field Emission Scanning Electron Microscope
 - b) Field Electron Scanning Emission Microscope
 - c) Fourier Emission Scanning Electron Microscope
 - d) Fourier Electron Scanning Emission Microscope

Q2. Solve the following.

- A) State any three factors affecting architectural acoustics. What are the remedial measures to remove it? 6
A hall has a volume of 2400 m^3 and total absorption of 300 sabins. Calculate the reverberation time using Sabine's formula.
- B) What is Magnetostriction effect? Describe the production of ultrasonic waves by using Magnetostriction method. 6

Q3. Solve the following.

- A) Derive the expression for interference in thin film due to reflected light with neat labelled ray diagram. 6
- B) Distinguish between Spontaneous and Stimulated emission of radiations. 6

Q4. Solve Any Two of the following.

- A) What is wave function? State the properties of wave function ' Ψ '. Give its physical significance. 6
- B) Derive an expression for Schrodinger time independent wave equation. 6
- C) What is difference between Classical computing and Quantum computing? 6

Q5. Solve Any Two of the following.

- A) Define atomic radius and atomic packing density of crystal structure. Obtain number of atoms for SC, BCC and FCC crystal structure. 6
- B) Show that for cubic lattice, the lattice constant ' a ' given by $a^3 = n M / N \rho$ where symbols have usual meaning. 6
Lithium has BCC structure. Calculate the lattice constant, given that the atomic weight and density are 6.94 and 530 kg/m^3
- C) State the properties of alpha, beta and gamma rays. 6

Q6. Solve Any Two of the following.

- A) What are nanomaterials? Explain top-down and bottom-up approach. 6
- B) Give the statement of Hall Effect with neat diagram. 6
The mobilities of carriers in intrinsic germanium sample at room temperature are $\mu_e = 3600 \text{ cm}^2/\text{Volt-sec}$, $\mu_p = 1700 \text{ cm}^2/\text{Volt-sec}$. If the density of electrons is same as holes and is equal to $2.5 \times 10^{13} / \text{cm}^3$. Calculate the conductivity.
- C) Prove that superconductors are perfectly diamagnetic using Messiner Effect. 6

*** End ***