Roll No. .....

Total No. of Questions : 06] [Total No. of Printed Pages : 04

EYS-84

B. Tech. (CSE, IT & Elect.) Examination, 2024

(Second Semester)

ENGINEERING PHYSICS

BE-201

Time : 3 Hours] **[Maximum Marks : 60**

Note : All questions are compulsory and carry equal marks. Internal choice is given from Q. Nos. 2 to 6.

1. Choose the correct answer :

(i) Uncertainty principle was discovered by :

(a) Bohr

(b) de-Broglie

(c) Heisenberg

(d) Schrödinger

(ii) Light beam after reflection from an optically denser medium undergoes a phase change of :

(a) π

(b) 0

(c) $\pi/2$

(d) 2π

(iii) Electrons can be accelerated by very high energies by means of :

(a) Cyclotron

(b) Betatron

(c) Synchrotron

(d) None of the above

(iv) In a P-type semiconductor, majority carriers are :

(a) holes

(b) electrons

(c) Both the above

(d) None of the above

(v) A laser beam is monochromatic. It means it has :

(a) single frequency

(b) narrow width

(c) wide width

(d) several colours

2. (a) Discuss compton effect with necessary theory.

Or

Compute the energy of the lowest three levels for an electron in a square well of width 2Å.

(b) By applying uncertainty principle, explain non-existence of electrons in atomic neucleus.

Or

Derive an expression for Schrödinger time independent wave equation.

3. (a) What is Diffraction ? Explain clearly the diffcrence between interference and diffraction.

Or

Explain the Phenomenon of Fraunhofer diffraction at a single split.

(b) In a plane transmission grating the angle of diffraction for second order maxima for wavelength 5×10^{-5} cm is 30°. Calculate the number of lines in one centimeter of the grating surface.

Or

Explain the working of Michelson interferometer.

4. What is Betatron ? Derive the betatron condition for successful acceleration of electrons.

Or

Write down the facts of nuclear liquid drop model and nuclear shell model.

5. Write a short note on Hall effect and its applications.

Or

Based on band theory of solids, distinguish among conductors, semiconductors and insulators.

6. Draw a neat diagram of He-Ne laser and describe its method of working. What are the characteristics of laser beam ? Discuss its important applications.

Or

Explain the basic principle of optical fibre. What is meant by acceptance angle of an optical fibre ? Derive the expression for the acceptance angle.