

BTPH101

B. Tech. [CE/EC/EC- IoT/ RA/IT/CSE-AIMLM/CSE-MA/CSE-ICS/CSE-ES]

B. Tech. + M.B.A. / B. Tech. + M. Tech. [CSE/CSE-BDA/CSE-CF/CSE-CC]

II Semester Examination, July - August 2022**Applied Physics**

Choice Based Credit System (CBCS)

Duration: 3 Hrs.**Maximum Marks: 60****Minimum Pass Marks: 24**

- Note:* (1) All questions carry equal marks, out of which part 'A' and 'B' carry 3 marks and part 'C' carries 6 marks.
(2) From each question, part 'A' and 'B' are compulsory and part 'C' has internal choice.
(3) Draw neat diagram, wherever necessary.
(4) Assume suitable data wherever necessary.

- Q.1.(A)** Define Heisenberg Uncertainty principle. **03**
(B) Define energy and momentum operators. **03**
(C) Define group velocity and phase velocity. Derive expression for them and relation between them. **06**

OR

What is Compton shift? Derive expression for it.

- Q.2.(A)** What are ideal diodes? **03**
(B) Explain V-I characteristics of Zener diode. **03**
(C) What are semiconductor materials? Define n- type and – p type semiconductors. **06**

OR

What is Hall's Effect? Derive expression for Hall voltage and Hall coefficient.

- Q.3.(A)** What are magic numbers in nuclear shell model? **03**
(B) What is the use of Betatron? How it is different from Cyclotron. **03**
(C) Give construction and working of Cyclotron? Discuss its limitations. **06**

OR

Discuss construction and working of Bainbridge mass-spectrograph.

Contd.....

- Q.4.(A)** What do you mean by population inversion? Discuss its significance. **03**
(B) What is the principle of light propagation through an optical fibre? **03**
(C) What are Einstein's Coefficients? Derive relation between them. **06**

OR

Discuss acceptance angle and numerical aperture. Derive expression for numerical aperture.

- Q.5.(A)** What is meant by resolving power of an optical instrument? Discuss Rayleigh criteria. **03**
(B) What is the difference between interference and diffraction of light? **03**
(C) Give a complete description of Newton's ring experiment and explain why the rings are circular in shape. **06**

OR

What do you understand by polarization of light? Discuss double refraction, optic axis and plan of polarization?

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