

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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