

B.Sc. Semester - 3 (CBCS) Examination
Nov/Dec. -2021 [NEW COURSE]
Physics-P301(Core)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1 (a) Answer the following questions (any two). [10]

- (1) Explain critical angle of propagation for an optical fiber.
- (2) Explain types of an optical fiber.
- (3) Discuss fiber optics communication system in detail.

Q.1 (b) Answer the following questions (any one). [04]

- (1) Write advantages of an optical fiber.
- (2) An optical fiber refractive indices of core and cladding are 1.50 and 1.45 respectively. Calculate its critical angle of propagation and acceptance angle.

Q.2 (a) Answer the following questions (any two). [10]

- (1) What is Laser? Discuss three processes of Laser.
- (2) What is population inversion? Discuss about principle pumping schemes.
- (3) Explain construction and working Ruby Laser.

Q.2 (b) Answer the following questions (any one). [04]

- (1) Write a note on PN junction Laser.
- (2) Write a note on optical resonant cavity.

Q.3 (a) Answer the following questions (any two). [10]

- (1) Describe base resistor method for transistor biasing. Write its advantages and disadvantages.
- (2) Describe voltage divider bias method for transistor biasing.
- (3) What is phase reversal? Explain it in detail with graphical demonstration.

Q.3 (b) Answer the following questions (any one). [04]

- (1) Discussing stabilization of operating point, explain its need.
- (2) Write a note on frequency response of CE amplifier.

Q.4 (a) Answer the following questions (any two). [10]

- (1) Deriving an expression of current for L-C-R series a.c. circuit, discuss its special cases and explain series resonance and Q – factor.
- (2) Explain Maxwell's L-C bridge. Write its advantages and disadvantages.
- (3) Explain the action of Wien bridge Oscillator.

Q.4 (b) Answer the following questions (any one). [04]

- (1) Explain R–C series a.c. circuit.
- (2) Explain Shearing bridge.

Q.5 (a) Answer the following questions (any two). [10]

- (1) What is modulation? Why modulation is necessary in communication system?
- (2) What do you mean by demodulation? Explain with necessary operation.
- (3) Write a note on Superhetrodyne radio receiver.

Q.5 (b) Answer the following questions (any one). [04]

- (1) Write difference between AM and FM modulation.
- (2) Explain working of a transistor amplitude modulator.
