

B.Sc. Semester - 3 (CBCS) Examination
December. -2020 [NEW COURSE]
Physics-P301(Core)

Time: 1:30 Hours**Marks: 42****Instructions:**

1. Figure to the right indicate marks.
 2. There are five questions in the question paper.
 3. Answer any three of the following questions.
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1(a) Answer the following question (any two). (10)

- (1) Explain the structure and characteristics of:
 - (i) single mode step index fibre
 - (ii) multimode step index fibre
- (2) Deduce an expression for acceptance angle of an optical fibre.
- (3) Discuss the following applications of optical fibres:
 - (i) medical applications
 - (ii) communication system

1(b) Answer the following question (any one). (4)

- (1) Write a short note on optical fibre
- (2) Discuss modes of propagation in an optical fibre

2(a) Answer the following question (any two). (10)

- (1) Describe the three level and four level pumping schemes for laser actions.
- (2) Describe the construction and working of a solid state ruby laser.
- (3) Write a note on He-Ne laser

2(b) Answer the following question (any one). (4)

- (1) Explain the condition for stimulated emission to dominate spontaneous emission.
- (2) Write a note on PN junction laser.

3(a) Answer the following question (any two). (10)

- (1) Describe emitter bias circuit in detail.
- (2) Explain the biasing with collector feedback resistor.
- (3) Write a short note on d.c. loadline.

3(b) Answer the following question (any one). (4)

- (1) Discuss stabilization of operating point
- (2) Write a short note on frequency response.

4(a) Answer the following question (any two). (10)

- (1) Explain L-R series circuit for a.c. source.
- (2) Discuss general conditions for bridge balance.
- (3) Write a note on Hartley oscillator.

4(b) Answer the following question (any one). (4)

- (1) Discuss electrical resonance in series L C R circuit.
- (2) Explain: De Sauty bridge.

5(a) Answer the following question (any two). (10)

- (1) Explain radio broadcasting, transmission and reception.
- (2) Write a note on modulation.
- (3) Describe types of AM radio receiver.

5(b) Answer the following question (any one). (4)

- (1) Discuss limitations of amplitude modulation.
- (2) Describe essentials in demodulations.