647510 **BSc3PhyC301x** **Seat No :_____**

B.Sc. Semester - 3 (*CBCS*) Examination
Oct/Nov - 2025 [New Course]
Physics-P301(Core)

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

Instructions:

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

Que.1(A) Answer the following question (any two). (10)

(1) Write a short note on critical angle of propagation.

(2) Explain modes of propagation.

(3) Write applications of optical fiber .

Que.1(B) Answer the following question (any one). (04)

(1) Write a short note on optical fibers.

(2) Discuss fiber optic communication system.

Que.2(A) Answer the following question (any two). (10)

(1) Describe population inversion in production of laser.

(2) Write a note on principle pumping schemes.

(3) Write a note on Nd-YAG laser.

Que.2(B) Answer the following question (any one). (04)

(1) Explain optical resonant cavity.

(2) Write a note on ruby laser.

Que.3(A) Answer the following question (any two). (10)

(1) Describe base resistor method in detail.

(2) Explain the biasing with collector feedback resistor.

(3) Write a note on practical circuit of transistor amplifiers.

Que.3(B) Answer the following question (any one). (04)

(1) Discuss stabization of operating point

(2) For the transistor amplifier having R_c=2KΩ, R_L=1KΩ, R_{in}=1KΩ, β=100. Find the voltage gain.

Que.4(A) Answer the following question (any two). (10)

(1) Explain L-R series circuit for a.c. source.

(2) Write note on De Sauty's bridge.

(3) Write a note on Hartley oscillator.

Que.4(B) Answer the following question (any one). (04)

(1) What is the resonance frequency of a series L-C circuit if L=200μH and C=200 pF.

(2) Explain positive feedback and Barkhausen criterion.

Que.5(A) Answer the following question (any two). (10)

(1) Explain radio broadcasting, transmission and reception.

(2) Write a note on frequency modulation.

(3) Explain demodulation with its essentials.

Que.5(B) Answer the following question (any one). (04)

(1) Discuss limitations of amplitude modulation.

(2) Write a short note on superhetrodyne receiver.

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