

Reg. No.				_

I Semester M.Sc. Degree Examination, March/April - 2025

PHYSICS

Electronic Circuit and Devices (CBCS Scheme 2020-21)

Paper: Phy 104

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Answer ALL the questions.

- 1. a) Define depletion capacitance. Derive an expression for depletion capacitance in a pn junction.
 - b) Explain the working principle of SCR.
 - c) Mention the factors affecting the efficiency of LED.

(7+4+4)

(OR)

- **2.** a) Write a note on Ohmic contacts.
 - b) Explain the construction, working principle and characteristics of MESFET. (5+10)
- 3. a) Explain the V-I characteristics of transistor in common emitter configuration.
 - b) Discuss the working of darlington pair configuration.

(8+7)

(OR)

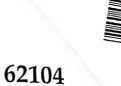
- 4. a) Discuss the significance of DC load line and optimum point in a transistor circuit.
 - b) Explain the dc analysis of dual input and dual output configuration of transistor difference amplifier. (5+10)
- 5. a) Draw the circuit diagram of first order low pass filter using op amp and discuss the phase and frequency response of the circuit.
 - b) Explain the working of Op-Amp as differentiator.

(10+5)

(OR)

6. With neat circuit diagram explain the working of an op-amp in the inverting configuration and hence derive an expression for closed loop gain, input impedance and output impedance.

[P.T.O.







Answer any FIVE of the following.

 $(5 \times 5 = 25)$

- 7. a) Explain in brief the band structure of pn junction at thermal equilibrium.
 - b) Discuss the working principle of photo diode.
 - c) Explain the working of transistor as voltage regulator.
 - d) Explain CMRR and difference mode gain.
 - e) Discuss the working of an Op-Amp as Summing amplifier.
 - f) Simplify using Karnaugh map $F(A,B,C,D) = \sum_{m} (1,2,3,6,8,9,10,12,13,14)$