

B.Sc. Sem.-2 Examination**103 - Electronics****Time : 2-30 Hours]****May - 2025****[Max. Marks : 70**

- Instructions :** (1) All questions are compulsory.
 (2) All question carry equal marks.
 (3) Symbols carry their usual meaning.

- 1 (a) Explain the mechanism of current flow in a PNP and NPN transistor. 07
 (b) Explain the different modes of operation of a transistor. 07
- OR**
- 1 (a) Define and explain stability factor S. Obtain the expression for stability factor S. 07
 (b) Draw the circuit of voltage divider bias and obtain stability factor 'S'. 07
- 2 (a) Considering a transistor as a 4 terminal active network, define and explain the hybrid or h-parameters. Also draw and explain the h-parameter equivalent circuit. 14
- OR**
- (a) Explain the difference between d.c. load line and a.c. load line. Why is it necessary to draw a.c. load line for calculating the voltage gain of an amplifier. 07
 (b) In a transistor amplifier, $R_c = 10K\Omega$, $R_L = 30K\Omega$ and $V_{CC} = 20V$. The value of R_1 and R_2 are so as to fix the operating point at 10V, 1mA. Draw the d.c. and a.c. load lines. Assume R_c is negligible. 07
- 3 (a) State and prove reciprocity theorem. 07
 (b) Give conversion between T-network to π network and π -network to T-network. 07
- OR**
- 3 (a) Explain series resonance with suitable circuit diagram. Derive the equation of impedance. 07
 (b) Explain Bandwidth of antiresonant circuit. 07
- 4 (a) Explain Pairs, Quad and Octets with suitable example. 07
 (b) Explain BCD to decimal decoder with proper circuit diagram and truth table. 07
- OR**
- 4 (a) Draw 16-to-1 multiplexer and explain its operation. 07
 (b) Explain sum of product method to reduce the logic equation with example. 07
- 5 Answer any seven : 14
- (1) Draw the schematic symbol for PNP and NPN transistor.
 (2) In which configuration, amplifier has lowest voltage gain?
 (3) Why is base made thin?
 (4) In which configuration, amplifier has lowest input impedance.
 (5) Give the units of Z-parameters and Y-parameters.
 (6) What is an active region in the characteristics of a transistor amplifier?
 (7) What is the condition for maximum power transfer?
 (8) Give the statement of superposition theorem.
 (9) By using which theorem, can we replace the whole circuit network by a voltage and resistor network?
 (10) How does Ex-OR gate differ from an OR gate?
 (11) Define Don't care condition.
 (12) What is the full form of ROM?