

Seat No. : _____

AC-110
April-2019
B.Sc., Sem.-II
103 : Electronics

Time : 2:30 Hours]

[Max. Marks : 70

- Instructions :** (1) All questions carry **equal** marks.
(2) Figures on the right indicate marks.
(3) Symbols have their usual meaning.

1. (a) Explain the mechanism of current flow in a PNP and NPN transistor. 7
(b) Draw the circuit of voltage divider bias and obtain stability factor 'S'. 7

OR

- (a) Explain the current components in a common base transistor with necessary diagrams. 7
(b) Draw the circuit of transistor connected in CE configuration with collector to base bias. Obtain stability factor 'S'. 7
(c) Answer in short any **four** 4
(1) Define stability.
(2) What is transistor biasing ?
(3) Name the three possible transistor connections.
(4) Define α of a transistor.
(5) Why is base made thin ?
(6) Give full form of BJT.

2. (a) Draw practical circuit of CE transistor amplifier and discuss how dc load line and operating point can be opted on output characteristics. 7
(b) Derive the general formula for input resistance, voltage gain and current gain in terms of 'h' parameter and load. 7

OR

- (a) Discuss impedance Z parameters and obtain Z_{11} , Z_{12} , Z_{21} and Z_{22} . 7
(b) Draw a circuit of common emitter amplifier. Drive the equation of current gain (A_i) and input resistance (R_i) from its h-parameter equivalent circuit. 7

- (c) Answer in short (any **four**). 4
- (1) Define Q point.
 - (2) Which type of amplifier has highest input impedance ?
 - (3) Why 'h' parameters are called hybrid ?
 - (4) In which configuration amplifier has lowest voltage gain ?
 - (5) Which is the smallest of four 'h' parameters of transistor ?
 - (6) How many types of transistor circuit configurations are there ?
3. (a) Explain the method to convert a T-network into its equivalent π -network and vice-versa. 7
- (b) Explain parallel resonance circuit and derive the expression of resonance frequency. 7
- OR**
- (a) State and explain Norton's theorem. 7
- (b) Obtain the equation of bandwidth $\Delta f = \frac{f_r}{Q}$ in the series resonance circuit. 7
- (c) Answer in short (any **three**) 3
- (1) What is bandwidth ?
 - (2) Give the statement of Thevenin's theorem.
 - (3) What is the condition for maximum power transfer ?
 - (4) Define impedance.
 - (5) Write the equation of impedance in series resonance.
4. (a) Explain Pairs, Quad and Octets with suitable example. 7
- (b) Explain BCD to decimal decoder with proper circuit diagram and truth table. 7
- OR**
- (a) Draw 16-to-1 multiplexer and explain its operation. 7
- (b) Explain sum of product method to reduce the logic equation with example. 7
- (c) Answer in short (any **three**) 3
- (1) On a Karnaugh map, a pair contain how many 1's ?
 - (2) Give full form of BCD.
 - (3) Define Don't care condition.
 - (4) What is overlapping in K-map ?
 - (5) Give full form of ROM.
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