

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  $\alpha$  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  $\pi$ -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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