

Seat No. : \_\_\_\_\_

**15G-102**

May-2015

**B.Sc., Sem.-II**

**Core Course-3 : Electronics**

**Paper-103**

**Time : 3 Hours]**

**[Max. Marks : 70**

- Instructions :** (1) All questions carry equal marks.  
(2) Symbols are used have their meaning as usual.

1. (a) Explain different modes of operation of a transistor. 7

**OR**

- (i) Draw a common base configuration of a PNP transistor. Explain current gain in common base configuration. 4

- (ii) A transistor has a  $I_C$  of 1.0 mA and  $I_B$  of 0.02 mA. What is the value of  $\alpha_{dc}$ ? 3

- (b) Name the different transistor biasing method. Explain base resistor method to bias transistor. 7

**OR**

Define and explain stability factor S. Obtain expression for stability factor S.

2. (a) Draw the practical circuit of a CE transistor amplifier. State the function of each components used in an amplifier. 7

**OR**

Give comparison of CB, CE and CC amplifier.

- (b) Draw a low frequency h-parameter equivalent circuit of a CE transistor amplifier. Derive expression for current gain and voltage gain with source resistance. 7

**OR**

Why the h-parameters are known as hybrid parameters ? Define hybrid h-parameter of a four terminal network. Also mention its names.

3. (a) Explain parallel resonance circuit and derive the expression of resonance frequency. 7

**OR**

What is bandwidth ? Obtain the equation of bandwidth  $\Delta f = \frac{f_r}{Q}$  in the series resonance circuit.

(b) State and explain Norton's theorem. 7

**OR**

Explain Bridge T network.

4. (a) Explain don't care condition. Reduce the logic equation  $F(A, B, C, D) = \sum m(7) + d(10, 11, 12, 13, 14, 15)$  by Karnaugh map and draw sum of product circuit to the result. 7

**OR**

Explain sum of product method to reduce the logic equation with example.

(b) Draw block diagram of a multiplexer. Explain its with logic circuit and truth table. 7

**OR**

What is Decoder ? Explain BCD to Decimal Decoder.

5. Answer in short : 14

- (1) Draw schematic symbol for PNP and NPN transistor.
  - (2) In which configuration amplifier has lowest voltage gain ?
  - (3) Which is the smallest of four h parameters of transistor ?
  - (4) By using which theorem we can replace the whole circuit network in single voltage and resistor network ?
  - (5) What is the condition for maximum power transfer ?
  - (6) Give the statement of superposition theorem.
  - (7) What do you mean by stabilization ?
  - (8) Which is the best method of bias to transistor ?
  - (9) On a Karnaugh map, a pair contain how many 1's ?
  - (10) Write fundamental products for two variables.
  - (11) How many select/control inputs are in a 16 to 1 multiplexer ?
  - (12) How does EX-OR gate differ from an OR gate ?
  - (13) Give full form of BCD.
  - (14) What is the source resistance of an ideal voltage source ?
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