

B.Sc. Sem.-2 Examination

103

Electronics

June 2022

Time : 2-00 Hours]

[Max. Marks : 50

SECTION I

Answer any three questions :

- 1 (a) Which are the different modes of operation of a transistor? Also discuss the different regions of operation. 7
(b) Name the three possible transistor connectios. Explain the operation of a transistor as an amplifier. 7
- 2 (a) Define stability factor "S". Which are the two other stability constants? Derive an expression for "S". 7
(b) Which are the different methods for transistor biasing? Describe the potential divider method in detail. 7
- 3 (a) What do you understand by hybrid parameters? Define the h-parameters of a CE transistor. 7
(b) Derive the general formula for input impedance, voltage gain and current gain of a four terminal network in terms of h-parameters and the load. 7
- 4 (a) Draw the circuit diagram of a single stage RC coupled transistor amplifier. State the function of each component used in the circuit. 7
(b) Give a classification of amplifiers. 7
- 5 (a) Explain how to convert a T-network to its equivalent π -network and vice versa. 7
(b) State and explain reciprocity theorem. 7
- 6 (a) What is BW? Obtain the expression for BW, $B = fr/Q$ for series resonant circuit. 7
(b) Explain parallel resonance circuit and derive the expression for resonance frequency. 7
- 7 (a) Explain sum of product method to reduce the logic equation with an appropriate example. 7
(b) Show karnaugh map for equation $Y = F (A, B, C, D) \sum m (1, 2, 4, 6, 7)$. 7
- 8 (a) Draw the block diagram of 16-to-1 multiplexer and explain its operation with truth table. 7
(b) Write a note on seven segment decoder. 7

[P.T.O.]

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SECTION II

Answer the following questions in short (any eight) :

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- 1 Name any two advantages of a transistor over a vacuum triode.
 - 2 In a transistor, why is the base made thin?
 - 3 What is transistor biasing?
 - 4 What is meant by “stabilization of the operating point”?
 - 5 What is a dc load line?
 - 6 What is the phase difference between input voltage and output voltage in common emitter amplifier?
 - 7 What can you say about the input impedance and output impedance of a common collector amplifier?
 - 8 What is the current gain of a CB amplifier?
 - 9 State the Norton’s theorem.
 - 10 State the maximum power transfer theorem.
 - 11 Define Q.
 - 12 On what factors does Q of an inductor depend?
 - 13 Give the full form of BCD.
 - 14 Define ‘Don’t Care’ condition.
 - 15 How does EX-OR gate differ from OR gate?
 - 16 What is a demultiplexer?
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