



Date: 08-11-2024

Dept. No.

Max. : 100 Marks

Time: 09:00 am-12:00 pm

SECTION A

Answer ANY FOUR of the following

4 x 10 = 40 marks

1. Illustrate the operation of 4-bit shift registers in both left and right shift modes with appropriate circuit diagrams.
2. What is the maximum power transfer theorem? Explain the theorem and determine the efficiency under the condition of maximum power transfer.
3. Describe the design and functioning of a depletion-mode MOSFET and analyze its drain and transfer characteristics.
4. Explain the concept of a DC load line in the context of single-stage amplifiers. How does it assist in maintaining a stable operating point?
5. Differentiate between synchronous and asynchronous counters.
6. Derive the voltage gain expressions for both inverting and non-inverting operational amplifiers, with neat circuit diagrams.
7. Explain the construction and operation of a field effect transistor (FET).
8. Describe the working principles and construction of a Colpitt's Oscillator.

SECTION B

Answer ANY THREE of the following

3 x 20 = 60 Marks

9. Describe the construction and operation of a two-stage RC-coupled amplifier with a clear circuit diagram.
10. Outline the procedure to solve two-variable simultaneous equations using operational amplifiers, with relevant circuit details.
11. Discuss the working principles of both summing and difference amplifiers, supported by appropriate circuit diagrams.
12. Explain the fabrication process of diodes, transistors, resistors, and capacitors within a monolithic integrated circuit (IC).
13. Describe the working of an astable multivibrator, including a circuit diagram.
14. State Norton's theorem and explain how to apply it by listing the steps involved in Nortonizing a circuit.

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