# LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **PHYSICS**

THIRD SEMESTER – **NOVEMBER 2024**

**16UPH3MC02 – ELECTRONICS - I**

Date: 12-11-2024 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. Explain the concept of a DC load line and its significance in analyzing a single-stage amplifier. How does it help determine the operating point stability?
2. Describe the construction and working of a field effect transistor (FET).
3. With neat circuit diagrams describe the operation of 4-bit shift left and shift right shift registers.
4. Explain the construction and working of a Colpitt's Oscillator.
5. Obtain the expression for the voltage gain of inverting and non-inverting OP-AMP amplifiers with neat circuit diagram.
6. Differentiate between asynchronous and synchronous counters.
7. Discuss the construction and operation of a depletion type MOSFET and explain its drain and transfer characteristics.
8. State and explain maximum power transfer theorem. What is the efficiency under the condition of maximum power?

## SECTION B

**Answer ANY THREE of the following** **3 x 20 = 60 Marks**

9. Discuss the operation of a summing amplifier and difference amplifier with neat circuit diagram.
10. State and explain Norton's theorem. List out the steps involved in Nortonising a given circuit.
11. Explain the fabrication of a diode, transistor, resistor and capacitor on a monolithic integrated Circuit (IC).
12. Describe the construction and working of two stage RC coupled amplifier with neat circuit diagram.
13. With necessary circuit explain the working of an astable multivibrator.
14. Explain how two variable simultaneous equations are solved using operational amplifiers.

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