LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FOURTH SEMESTER – **APRIL 2015**

PH 4506 - ELECTRONICS - I

Date : 16/04/2015
Time : 09:00-12:00

Dept. No.

Max. : 100 Marks

PART – A

**Answer ALL Questions:** (10 x 2 = 20 marks)

1. State Norton's Theorem.

2. Define a linear circuit.

3. Explain d.c. load line.

4. Determine the operating frequency of a Colpitt's oscillator given C_1=0.001µF, C_2=0.01µF and L=15mH.

5. State two characteristic feature of an ideal op-amp.

6. Define CMRR and express it in decibels.

7. Simplify the Boolean expression, $Y = (A+B+C).(A+B)$.

8. Draw the logic symbol and write the truth table of a D flip-flop.

9. State any two advantages of Integrated Circuits.

10. Write the four basic types of constructions employed in the manufacture of IC.

PART – B

Answer ANY FOUR Questions: (4 x 7.5 = 30 marks)

11. State superposition theorem and use it to find the current through R_1 in the following circuit where V_2=10V; V_1=5V; R_1=1Ω; R_2= 3Ω; R_3=2Ω. (1.5+6)
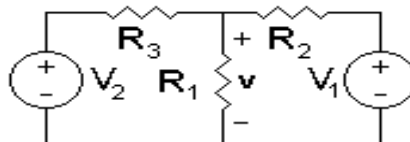
12. Explain with a neat circuit the voltage divider biasing technique. (7.5)

13. Describe the construction and working of an n-channel JFET (2.5+5)

14. Design a 4-to-1 multiplexer and explain its operation with the relevant function table. (7.5)

15. Write short note on memory devices ROM and RAM. (4.5+3)

16. Explain the fabrication of monolithic Integrated Circuits. (7.5)

PART C

Answer ANY FOUR questions: **(4 x 12.5 = 50 marks)**

17. Obtain expressions for Ai, Av and Zi interms of 'h' parameters for a transistor amplifier connected in common emitter configuration with necessary equivalent circuit. (3.5+9)

18. Explain with a neat circuit the functioning of an RC coupled amplifier. Discuss its frequency response curve. (12.5)

19. (a) Describe with a circuit diagram the functioning of an op-amp as a summing amplifier.

    (b) Explain the functioning of SCR as a switch. (6.5+6)

20. (a) Explain the working of a JK flip flop with the logic diagram and truth table.

    (b) Draw the logic circuit and explain the working of a 3 bit binary ripple counter with the relevant truth table. (6.5+6)

21. With a neat circuit explain the working of a transistor Astable Multivibrator. (12.5)

22. Explain with necessary diagrams the fabrication of transistor and resistor on monolithic Integrated Circuits. (6.5+6)

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