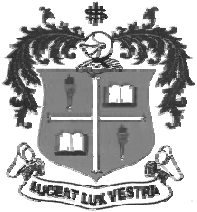# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **COMPUTER SCIENCE**

THIRD SEMESTER – **NOVEMBER 2013**

PH 3106 - APPLIED ELECTRONICS

Date : 16/11/2013   Dept. No.   Max. : 100 Marks
Time : 9:00 - 12:00

PART – A

Answer **ALL** questions   (10 x 2 = 20)

1. Define Fermi level.
2. Write four important characteristics of an ideal operational amplifier.
3. What is meant by doping?
4. Define CMRR.
5. State Demorgan's theorems.
6. What is a Flip flop?
7. Find the complement of $A\bar{B} + \bar{C}\bar{D}$.
8. Draw the block diagram of a ` D ´ Flip Flop using JK Flip Flop and give its truth table.
9. Write the differences between RAM and ROM.
10. What is a cache memory?

PART - B

Answer any **FOUR** questions   (4 x 7.5 = 30)

11. Explain the 'n' and 'p' type semiconductors.

12. Explain the working of an OP-AMP inverting amplifier with a circuit diagram.

13. With neat diagrams explain how NAND gates may be used as universal building blocks.

14. Explain the working of a shift left register using D-flip flop

15. Draw the block diagram and explain the memory hierarchy in a computer system.

PART - C

Answer any **FOUR** questions   (4 x 12.5 = 50)

16. Explain the mechanism of current conduction and hence derive the expression for the total current density in different types of semiconductor.

17. Explain with circuit diagram, the working of an op-amp based 4 bit R-2R ladder D/A converter.

18. (a) Simplify using K – map F(A,B,C,D) = Σ (0,2,5,7,8,9,10,11,12,13,14,15)   (8.5)

    (b) Show that $(\bar{A} + B)(\bar{B} + C)(\bar{C} + A) = (A + \bar{B})(B + \bar{C})(C + \bar{A})$ (4)

19 a) What is racing in JK Flip Flop ?   (2)

    b) How is it solved in JK Master Slave Flip Flop.   (10.5)

20. a) Discuss in detail the computer registers.   (6)

    b) Explain the working of a full adder with circuit diagram and truth table   (6.5)

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