



# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

## B.Sc. DEGREE EXAMINATION – COMPUTER SCIENCE

THIRD SEMESTER – NOVEMBER 2016

### PH 3106 - APPLIED ELECTRONICS

Date: 12-11-2016  
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

#### PART A

ANSWER ALL QUESTIONS

10×2=20

1. What is depletion layer?
2. Define CMRR of an Op-Amp.
3. What is a semiconductor? Name the types.
4. Calculate the output voltage of an inverting amplifier when  $V_i = 2V$ ,  $R_i = 20K\Omega$ ,  $R_f = 40K\Omega$
5. Simplify  $Y = [AB(C+\overline{BD})+\overline{AB}]C$
6. Simplify using K-map =  $F(A,B,C) = \Sigma(1,2,3,5,7)$
7. What is a flip flop?
8. What are shift registers?
9. What is cache memory?
10. List the various computer registers.

#### PART B

ANSWER ANY FOUR QUESTIONS

4×7.5=30

11. Write short notes on (i) solar cell (ii) PN junction diode.
12. Explain the working of a difference amplifier with neat diagram.
13. Draw the block diagram and explain the memory hierarchy in a computer system.
14. Explain the working of a full adder with circuit diagram and truth table
15. Simplify using K-map  $Y=F(A,B,C,D)=\Sigma(0,1,3,5,7,9,11,12,13,14,15)$

#### PART C

ANSWER ANY FOUR QUESTIONS

4×12.5=50

16. Explain with circuit diagram, the working of an op-amp based 4 bit binary weighted R-2R ladder D/A converter.
17. (a) Discuss the working of a 2 input multiplexer with diagram (5 marks)  
(b) State and prove Demorgan's theorem (7.5 marks).
18. (a) Explain the working of a D flip flop with a diagram. (7.5 marks)  
(b) Show that  $(\overline{A} + \overline{B})(\overline{B} + \overline{C})(\overline{C} + \overline{A}) = (A + \overline{B})(B + \overline{C})(C + \overline{A})$  (5 marks)
19. Describe the operation of a NPN transistor in common emitter mode. Obtain the input and output characteristics for the same.
20. (a) Show NAND as an universal building block (7.5 marks)  
(b) Give four differences between RAM and ROM (5 marks)

\*\*\*\*\*