



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**U.G. DEGREE EXAMINATION – ALLIED
THIRD SEMESTER – NOVEMBER 2022
UPH 3405 – DIGITAL ELECTRONICS**

Date: 01-12-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART – A

Answer ALL questions

(10x 2 = 20 Marks)

1. Convert the octal number $(75)_8$ to its decimal equivalent.
2. Convert $(1020)_{10}$ into a hexadecimal number.
3. Define negative and positive logic.
4. Draw the symbol of a NOR gate and give its truth table.
5. Write any two laws of Boolean algebra.
6. What is meant by sum of products method?
7. What is a flip flop?
8. Draw the diagram of a T flip flop and give its truth table.
9. What is a register?
10. List the different types of counters.

PART – B

Answer any FOUR questions

(4 x 7.5 = 30 Marks)

- 11 a) Convert $(11110)_2$ into a decimal number. (2.5 marks)
b) Convert $(1486)_{10}$ into an octal number. (2.5 marks)
c) Convert $(600)_{10}$ into a hexadecimal number. (2.5 marks)
- 12 With a neat diagram, explain the working of AND, OR, NOT and Ex-OR gates.
- 13 Simplify using K map $Y = F(A, B, C, D) = \Sigma(0,1,3,5,7,9,11,12,13,14,15)$.
- 14 Explain the working of a clocked RS flip flop and give its truth table.
- 15 With a neat diagram, describe the working of a shift right shift register.
- 16 Discuss in detail the working of a synchronous up counter.

PART – C

Answer any FOUR questions

(4 x 12.5 = 50 Marks)

- 17 Explain NAND and NOR as universal gates with a neat diagram and draw their truth tables.
- 18 What is a shift register? With a neat logic diagram explain the working of parallel-in serial- out and parallel-in parallel-out shift registers.
- 19 a) Add 12 and 13 using binary number system. (3 marks)
b) Convert $(456)_{10}$ to octal number. (3 marks)
c) Convert the decimal number $(1542)_{10}$ to hexadecimal number. (3 marks)
d) Find the equivalent decimal number for the binary number 110011001_2 . (3.5 marks)
- 20 With a neat diagram and truth table explain the working of a JK flip flop.
- 21 Draw the circuit diagram of Mod 4 and Mod 8 counters and explain its working.
- 22 Simplify using K map: $Y = F(A, B, C, D) = \Sigma(0,1,2,4,5,10,11,14,15)$ and draw the logic circuit for the simplified expression.

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