

K-990

Total Page No. : 3]

[Roll No.]

MCS-404/DCA-104

**(MSCIT/DCA) Ist Semester
Examination Dec., 2023**

DIGITAL ELECTRONICS

Time : 2 Hours]

[Max. Marks : 70

Note :- This paper is of Seventy (70) marks divided into two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given there in. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section-A

Long Answer Type Questions 2×19=38

Note :- Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only.

K-990

(1)

P.T.O.

1. (a) Use 2's complement of perform $(10111 - 10011)_2$.
 (b) Carry out subtraction using : 1's complement for $(1010100 - 1000100)_2$.
 (c) Subtract 864 frm 753 suing 10's complement method.
2. Explain SOP and POS. Solve the given Boolean expression using K-map is SOP method :

$$F(ABCD) = \Sigma M(4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)$$
3. Explain combinational circuit. What is a decoder ?
 Explain 3 to 8 decoder with logic diagram.
4. Explain counter. Give the comparison between synchronous and Asynchronuous counters.
5. Minimise the following problems using Karnaugh maps method :

$$Z = f(ABC) = \bar{C} + \bar{A}B + AB\bar{C} + AC$$

$$Z = f(A, B, C) = \bar{A}B + B\bar{C} + BC + A\bar{B}\bar{C}$$

Section-B

Short Answer Type Questions 4×8=32

Note :- Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Explain what is coding and decoding of information ?
What are the desirable properties of codes ?
2. Draw the XOR logic using only NAND gates.
3. Explain the functioning of a multiplexer and a demultiplexer.
4. Explain the working of and master-slave flip-flop with a proper circuit diagram.
5. Show how a D Flip-Flop can be converted into JK-Flip-Flop.
6. What is universal shift register ? Draw the circuit diagram of universal shift register and explain its working.
7. What is RAM ? Differentiate SRAM with DRAM.
8. Write a short notes on PROM, EPROM, EEPROM.
