

B.E. / B.Tech. (Instrumentation Engineering) Model Curriculum Semester-IV
IN402M - Digital Circuits and Fundamentals of Microprocessors

P. Pages : 2

Time : Three Hours



GUG/W/24/14015

Max. Marks : 80

- Notes :
1. Same answer book must be used for each section.
 2. All questions carry marks as indicated.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Minimize the following expression using K-map. 8
i) $F(A, B, C) = \sum m(0, 1, 6, 7)$
ii) $F(A, B, C) = \sum m(0, 1, 3, 5, 7)$
- b) Express the reduction of the following expressions. 8
 $Y = (A + B) \cdot (A + BC) + \bar{A}\bar{B} + \bar{A}\bar{C}$

OR

2. a) Minimize the following expression using K-map. 8
 $F(A, B, C, D) = \sum m(0, 1, 3, 5, 6, 9, 11, 13, 15)$
- b) State and prove DeMorgan's theorem. 8
3. a) Obtain a full adder from half adder circuits. 8
- b) Implement the following logic function by using suitable DMUX. 8
 $F(A, B, C) = \sum m(0, 1, 4, 6, 7)$

OR

4. a) Obtain a 32:1 MUX using two 16:1 MUX and one 2:1 MUX. 8
- b) What is comparator? Design 1 bit magnitude comparator. 8
5. a) What is sequential circuit? State the difference between combinational and sequential circuit. 8
- b) What is D flip-flop? Give the truth table for D flip-flop and explain the working write characteristic equation of D flip-flop. 8

OR

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| 6. | a) Convert JK flip-flop to SR flip-flop. | 8 |
| | b) Explain how a latch can be used as 1 bit memory cell. | 8 |
| 7. | a) Illustrate the functions perform by following instruction.
SHLD addr-16
DAD Rp
XCHG
LXI Rp, data-16 | 8 |
| | b) Write a program to add 1234H and 5678H. Store the result into memory locations starting from 7850H. | 8 |

OR

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| 8. | a) Enlist & explain all 16 bit registers associated with 8085 and write the role of HL register pair as a memory pointer. | 8 |
| | b) Discuss the register organization of 8085 μ p and elaborate the importance of Accumulator. | 8 |
| 9. | a) Interpret the interfacing of 4 KB EPROM IC with Microprocessor 8085 using starting address 2000H with required chip select signal. | 8 |
| | b) Discuss the architecture of 8279. | 8 |

OR

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| 10. | a) Write a short note on “Interfacing of output devices with 8085 Microprocessor” | 8 |
| | b) Describe the interfacing of 8255 with 8085 microprocessor. | 8 |
