Roll No. …… Total Pages:
10417

MCA/D-12
COMPUTER ORGANISATION
Paper-MCA-102

Time allowed: 3 hours Maximum marks: 80

Note: Attempt five questions in all. Question no. 1 is compulsory.
Attempt four more questions selecting one question from each unit.

Compulsory Question

1. Answer the following questions in brief: 8x3=24
(a) Draw the truth table for three-input equivalence gate.
(b) State three-variable DeMorgan's laws.
(c) What is flash memory? Enumerate its applications.
(d) What is flip-flop? What are limitations of JK flip-flop?
(e) What is zero address instruction formats? Explain its application.
(f) If main memory size is 256MW and word size is 32 bit then compute the size of MAR and MBR.
(g) Implement f = X'Y + X'Y + Z using (i) NAND gates, and (ii) NOR gates.
(h) Why can't you connect I/O devices directly with a system bus?

Unit-I

2. (a) Represent 73_{10} in 1's complement, ternary, duo-decimal, BCD code, ASCII, Unicode and EBCDIC code. 7
(b) What is error correcting code? Design single error detecting and single-error correcting Hamming code for excess-3 BCD code. 7
3. (a) Simplify Z(Y+Z)(X+Y+Z) by using Boolean algebra. 4
(b) Convert (A+B)(B+C) into canonical forms. 4
(c) Explain Booth multiplication by giving an example. 6

Unit-II

4. (a) What is Full subtractor? Draw its truth table. Design it by using half subtractors. 7
(b) Implement Y= (A+B+C)(D+E)F using OR-AND logic and using NOR-NOR Logic. 7
5. (a) What is combinational circuit? Design decimal to BCD encoder. 7
(b) Design 4x16 line decoder using two 3x8 line decoders. 7

Unit-III

6. (a) What is Edge-triggered flip-flop? Explain the construction and working of D-type edge Triggered flip-flop. 7
(b) Design a module-10 counter using JK flip-flop. 7
7. (a) Draw a circuit diagram of SRAM binary, cell. Explain read and wwrite operations on it. Also, differentiate between SRAM and DRAM. 7
(b) What is CD-ROM? Explain construction and working of CD-ROM. 7

Unit-IV

8. (a) Explain various displacements based addressing modes? 7

(b) Explain instruction cycle of a computer system with the help of a flow chart. 7

9. Write short note on the following:

(a) Microprogram Sequencer. 7

(b) IOP. 7