PC-123/AK

O-1/2041

COMPUTER ORGANISATION AND ARCHITECTURE

Paper – MS(A)-113

Ist Year (Annual)

Time : Three Hours] [Maximum Marks : 80

Note : Attempt *five* questions in all, selecting at least *two* questions each from Section A and B. Section C is compulsory.

SECTION – A

I. Draw MOD-8 (UP & DOWN) synchronous counter. 16

II. Explain with an example, how effective address is calculated in different types of addressing modes? 16

III. Solve the following function to SOP & POS forms using 4 variable Karnaugh Map and implement using NAND/NOR gates :
$F = \Pi M(0, 1, 2, 3, 8, 9, 10, 11, 14) + d(7, 15)$. 16

IV. What is half adder? Design a half adder as a two-level AND-OR circuit and show how to implement a full adder using two half adders and a external logic gate. 16

SECTION – B

V. What is the necessity of cache memory? Explain set associative cache mapping. 16

VI. What is Microprogram? Write microprogram for following operations :

(i) ADD RI, M, Register R1 and Memory location M are added and result store at Register R1.

(ii) MUL R1, R2 Resister R1 and Register R2 are multiplied and result store at Register R1. 16

VII. Explain the page address translations in case of virtual memory and explain TLB. 16

VIII. With neat block diagram, explain how DMA controller is initialized for DMA data transfer? 16

SECTION – C

(Compulsory Question)

IX. (a) Differentiate between Computer Architecture and Organization. 2

(b) Differentiate between Arithmetic Shift Left and Arithmetic Shift Right. 2

(c) How many 128 × 8 ROM memory chips are needed to provide a memory capacity of 4096 × 16? 2

(d) Which types of signals are necessary to activate the external interrupts of 8085? 2

(e) What is the advantage of relative addressing mode? 2

(f) What is the importance of secondary storage in Implementing Virtual Memory? 2

(g) What are hardwired and microprogrammed controls? 2

(h) What is the need for memory hierarchy? 2