ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

COMPUTER ARCHITECTURE AND SYSTEM SOFTWARE

SEMESTER - 2

Time : 3 Hours] [Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) The instruction LOAD A is a

a) zero address instruction b) one address instruction

c) two address instruction d) three address instruction. ☐

ii) The purpose of cache memory in a computer is to

a) ensure fast booting b) reduce load on CPU registers

c) replace static memory d) speed up memory access. ☐

iii) Object code is

a) input to assembler b) output of assembler

c) intermediate code d) none of these. ☐

iv) Which of the following is not an advantage of Dynamic RAMs ?

a) High density b) Low cost

c) High speed d) No need of memory refresh. ☐

v) DMA module can communicate with CPU through

a) interrupt b) cycle stealing

c) branch instruction d) none of these.

vi) The number of fetch operation(s) to execute instruction in immediate mode is

a) 0 b) 1

c) 2 d) none of these.

vii) A CPU has 16 bit program counter(PC). This means CPU can address

a) 16K b) 32K

c) 64K d) 256K memory locations.

viii) The major objective in choosing page replacement policy is to

a) minimize hit ratio b) reduce size of page

c) maximize hit ratio d) none of these.

ix) The sum of $(24D)_{16}$ and $(9AA)_{16}$ is

a) $(BE7)_{16}$ b) $(BE6)_{16}$

c) $(AF7)_{16}$ d) $(BE7)_{16}$.

x) In a stack computer, there is support for

a) PUSH and POP instruction only

b) zero address instruction only

c) zero address instructions, PUSH and POP

d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Distinguish between Fixed point and Floating point representations. 5

3. Distinguish between vectored and non-vectored interrupt. What is subroutine ? 4 + 1

4. What are the 16-bit registers available in 8085 Microprocessor ? Write about them. 2 + 3

5. Why is 'bootstrap loader' program stored in ROM and not in RAM ? 5

6. a) What would be happen if a computer does not have any OS installed in it ?

   b) What are the differences between static memory and dynamic memory ?

   c) What is flash memory ? 2 + 2 + 1

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Explain memory interleaving with diagram.

   b) Write short note about content addressable memory (CAM) with diagram.

   c) Discuss direct mode and indirect mode of addressing of instruction with examples. 5 + 6 + 4

8. a) What is parallel processing ?

   b) What is arithmetic pipelining ?

   c) What is vector processing ? Explain how matrix multiplication is performed using vector processing. 6 + 4 + (1 + 4)

9. Draw and explain a 4-bit arithmetic circuit which can perform the following : 15

a) Add

b) Add with carry

c) Subtract with borrow

d) Subtract

e) Transfer of *A*

f) Transfer *A*

g) Increment

h) Decrement.

10 a) What is virtual memory ? What could be the maximum size of virtual memory ? Justify.

b) Briefly explain an instruction execution cycle with proper timing diagram.

c) Explain the Booth algorithm. Illustrate with an example.

d) Briefly discuss different types of ROM.

e) Differentiate between static RAM and dynamic RAM. 3 + 3 + 3 + 3 + 3

11. Write short notes on any *three* of the following : $3 \times 5 = 15$

a) Single-pass assembler

b) DMA controller

c) Interrupt handling

d) Cache memory

e) Shift micro-operations.

END