



Name :

Roll No. :

Invigilator's Signature :

CS/B.TECH(CSE-OLD)/SEM-3/CS-303/2011-12
2011
COMPUTER ORGANIZATION

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$
 - i) The principle of locality justifies the use of
 - a) Interrupt
 - b) Polling
 - c) DMA
 - d) Cache memory
 - ii) Instruction cycle is
 - a) fetch-decode-execution
 - b) fetch-execution-decode
 - c) decode-fetch-execution
 - d) none of these.
 - iii) Subtractor can be implemented using
 - a) adder
 - b) complementer
 - c) both (a) and (b)
 - d) none of these.
 - iv) How many RAM chips of size (256 KX 1 bit) are required to built 1M Memory ?
 - a) 24
 - b) 10
 - c) 32
 - d) 8.

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GROUP – B

(Short Answer Type Questions)

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

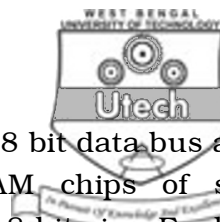
2. a) What is tri-state buffer ? Construct a single line common bus system using tri-state buffer.
b) What are guard bits ? $(1 + 2) + 2$
3. Describe stack based CPU.
4. a) Write $+7_{10}$ in IEEE 32 bit format.
b) Convert IEEE 32-bit format 40400000_{16} in decimal value.
c) What is the role of an Operating System ? $2 + 2 + 1$
5. Evaluate the following arithmetic expression into three-address, two-address, one-address, zero-address instruction format :
 $X = (A + B) * C$
6. a) Explain the difference between full associative and direct mapped cache Mapping approaches.
b) What are “Write through” and write back “ policies in cache ? $3 + 2$

GROUP – C

(Long Answer Type Questions)

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

7. What is virtual memory ? Why is it called virtual ? What are the different address spaces ? Explain with example how logical address is converted into physical address and also explain how page replacements take place. Explain the instruction cycle with a neat diagram. Explain the disadvantages of stored program computer. $2 + 2 + 4 + 5 + 2$



8. Show the memory map with a CPU having 8 bit data bus and 16 bit address bus requiring four RAM chips of size 256×8 bit each and a ROM chip of 512×8 bit size. Explain the memory map. Among dynamic MOS cell and static MOS cell which one is used for the construction of cache memory and which one for main memory ? What is destructive readout and non-destructive readout memory ? $7 + 4 + 4$
9. Explain with a neat diagram circuit diagram of static MOS cell and dynamic MOS cell. Describe memory reading and writing process. What is daisy chaining ? Discuss the data transfer using the DMA, $2 + 7 + 2 + 4$
10. Discuss various addressing modes with examples. Write a program that can evaluate the expression $X = A - B + C - D$ in a single accumulator processor. Assume that the processor has load, store, sub and add instructions. What is the difference between zero address and one address instructions. Write a short note on overflow detection with examples. What are status flags ? $5 + 3 + 2 + 5$
11. Write short notes on any *three* of the following : 3×5
- a) Carry look ahead adder
 - b) Design of a 4-bit adder-sub tractor circuit
 - c) Tri-state buffer
 - d) Booth's algorithm for multiplication
 - e) Cache memory.
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