



# MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : BCAC201 Computer Architecture

UPID : 2000077

Time Allotted : 3 Hours

Full Marks : 70

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

## Group-A (Very Short Answer Type Question)

1. Answer any ten of the following :

[ 1 x 10 = 10 ]

- (I) An example of volatile memory is \_\_\_\_\_.
- (II) Stack organization uses one or zero address instruction?
- (III) What is an interrupt?
- (IV) RISC architecture has hardwired based CU or microprogrammed CU?
- (V) The full form of CAM is \_\_\_\_\_.
- (VI) The 1's complement of  $(-1010)$  is \_\_\_\_\_.
- (VII) Name any two special purpose registers.
- (VIII) Write an example of arithmetic right shift operation.
- (IX) Name any two Register reference computer instruction.
- (X) What is microprogram?
- (XI) Name one pipeline hazard.
- (XII) In a pipelined system having 'm' tasks and 's' number of segments, the maximum speed up factor is \_\_\_\_\_.

## Group-B (Short Answer Type Question)

Answer any three of the following :

[ 5 x 3 = 15 ]

2. Multiply  $(11)_{10} \times (9)_{10}$  using Booth's algorithm. [5]
3. Discuss Flynn's Classification of modern computers. [5]
4. Compare between microprogrammed control unit and hardwired control unit. [5]
5. Write the difference between RISC and CISC architecture. [5]
6. What is floating point representation? Represent the number  $(1001)_2$  in normalized floating point form. [5]

## Group-C (Long Answer Type Question)

Answer any three of the following :

[ 15 x 3 = 45 ]

7. (a) Write down the utilities of input output interface . [ 5 ]  
 (b) Explain with diagram the connection of I/O Interface with the processor by I/O buses. Also explain the functions of different I/O buses. [ 5 ]  
 (c) Differentiate between Isolated Input Output and Memory mapped I/O. [ 5 ]
8. (a) What is Virtual Memory? [ 3 ]  
 (b) What is the size of the virtual memory of a system? [ 3 ]  
 (c) Write the difference between Static Ram and Dynamic Ram. [ 5 ]  
 (d) Explain the difference between Associative Cache mapping and Direct Cache mapping. [ 4 ]
9. (a) Draw an arithmetic circuit that can be used as an arithmetic adder, subtractor, incrementer and decrements. [ 7 ]  
 (b) Explain the following operations with examples: [ 5 ]  
 i) Insert  
 ii) Clear  
 (c) What is a micro operation? [ 3 ]
10. (a) Subtract the following numbers using 1's complement. [ 5 ]  
 i)  $(1001)$  and  $(11)$   
 ii)  $(1101) - (1001)$   
 (b) Write down the division algorithm. [ 5 ]

(c) Explain the addition algorithm of signed magnitude using a suitable example. [ 5 ]

11. (a) Write down the micro instructions to add to numbers using [ 5 ]

- i) One address CPU Instructions.
- ii) Two address CPU Instruction
- iii) Three address CPU Instructions.

(b) What is an Interrupt? Differentiate between External and Internal Interrupt. [ 5 ]

(c) Give two examples of each of the following: [ 5 ]

- i) Data Transfer Instructions
- ii) Data Manipulation Instructions.
- iii) Program Control Instructions.

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