



MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : MCAN-103 Computer Organization and Architecture

UPID : 001609

MCA

Time Allotted : 3 Hours: *Go slow in answer*

Full Marks : 70

W.D.

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 x 10 = 10]

1. Answer any ten of the following :

- Which method is used to access the I/O devices by repeatedly checking the status flags?
- What is said to be the Individual control words of the micro routine?
- Why a Cache memory is considered as the onboard storage?
- When the architecture supports one instruction per cycle, is called as ____.
- Write the applications of Octal System.
- How many different combinational inputs can generated by a 3-bit Full ADDER?
- What is an Interrupt?
- Which device helps to read the control words sequentially?
- Evaluate the Storage Capacity of the memory where m =number of memory locations and n =word size.
- Let the number of instructions be $n=64$, find out the speedup value for a 4 segment linear pipeline.
- Find the value of base x of the following.
 $(321)_x = (57)_{10}$
- Which gate is used to convert a NOR-based SR latch to an SR flip-flop?

Group-B (Short Answer Type Question)

Answer any three of the following :

[5 x 3 = 15]

- Discuss the direct mapping technique of cache memory. [5]
- Make a comparative study among interrupt I/O over programmed I/O? [5]
- Find the value of x from the following:
 $(675)_9 = (2322)_x$ [5]
- What is don't care condition and when it is presented? [5]
- Decode 1101 with a One 4-input AND gate and one inverter. [5]

Group-C (Long Answer Type Question)

Answer any three of the following :

[15 x 3 = 45]

- Make a comparative study between DRAM and SRAM. [5]
 - Explain the concept of virtual memory in brief. [7]
 - Which memory is Independent of address bus? Why? [3]
- Draw the logic circuit of the traffic control system from the below table: [6]

Input J	Input K	Red Light X	Yellow Light Y	Green Light Z
0	0	1	0	0
0	1	1	1	0
1	0	0	0	1
1	1	0	1	0

- Draw the combined Circuit for the above problem. [3]
 - What do you understand by Clock pulse of a Flip-Flop? [3]
 - Draw the logic Combination circuit diagram which takes a single *input* ~~output~~ and latches it to multiple outputs depending on the select lines. [3]
- What is auto increment and Auto decrement counter? [3]

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- (b) Find out the effective address of the following instruction: MUL 5(R1,R2) [2]
- (c) Explain the steps of Instruction Execution in computer in details. [10]
10. (a) What are the functions for ALE, READY and HOLD signals? [7]
- (b) RIM and SIM are the 8085 instruction set. Where they are find in accumulator. Write the bit pattern for them. [8]
11. (a) A nonpipelined system takes 300ns to process a task. The same task can be processed in a 5-segment pipeline with a clock cycle of 60ns. Determine the speedup ratio of the pipeline for 100 tasks. [5]
- (b) Describe the different segments of a 4- stage pipeline and their working procedure? Explain in brief. [10]

*** END OF PAPER ***



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