

BACHELOR OF ENGINEERING IN INFORMATION TECHNOLOGY
2nd YEAR 1st SEMESTER SUPPLEMENTARY EXAMINATION,-2017

Computer Architecture

Time: 3 Hours

Full Marks: 100

Answer from each group

Group I

(Answer any Ten Questions)

1 * 10 = 10

1. CISC stands for
2. Memory unit that communicates directly with the CPU is called
3. The pipeline operates on a stream of instruction by overlapping the phases of instruction cycle is
4. The 2's compliment form(use 6 bit word) of the number 1010 is.....
5. In RAM chip DATA BUS is
6. SIMD stands for.....
7. In a stack organization SP is.....
8. Write the names of control words in stack organization.....
9. K-map for half adder is of variables.
10. ROM is a memory.
11. An address in main memory is called.....

Group II

(Answer any Ten Questions)

2 * 10 = 20

1. Define Computer Architecture.
2. What is multiprogramming?
3. List the steps involved in an Instruction pipeline.
4. Hexadecimal subtraction using 2's complement method:- $C3_{16} - 0B_{16}$.
5. Convert Gray code to Binary number:-- 1001011101110.
6. Convert decimal number 359_{10} to octal number.(Using division method)
7. Explain the pipelining type.
8. Determine the number of clock cycle that it takes to process 200 tasks in a 6 segment pipeline.
9. What is the role of MAR and MDR?
10. Define memory access time?
11. What are the various units in the computer?

Group III
(Answer any Five Questions)

5 * 6 = 30

1. Explain 2 mapping process of cache memory with diagram. 3 + 3
2. Explain the hardware organization of associative memory. 6
3. What is auxiliary memory? A non-pipeline system takes 50ns to process a task. The same task can be processed in a 6 segment pipeline with a clock cycle of 10ns. Determine the speedup ratio of the pipeline for 100 tasks. 2 + 4
4. Evaluate the arithmetic statement $X = (A+B)*(C+D)$ using a general register computer with three address, two address instruction format. 6
5. Explain selective-complement, selective-clear operation. 3 + 3
6. Explain SISD, SIMD with diagram. 3 + 3

Group IV
(Answer any Four Questions)

4 * 10 = 40

1. Explain pipeline process : $A_i * B_i + C_i$ for $i = 1, 2, 3, \dots, 7$ with proper diagram.
2. Simplify the following Boolean function in sum-of-products forms by means of a four-variable map. Draw the logic diagram with
(a) AND-OR gates (b) NAND gates
 $F(A, B, C, D) = \sum(0, 2, 8, 9, 10, 11, 14, 15)$ (Explain the process).
3. Explain Arithmetic pipelining with pictorial diagram. 10
4. a) Difference between RISC and CISC.
b) Apply DeMorgan's theorems 4+6
$$\overline{AB(CD + EF)(\overline{AB} + \overline{CD})}$$
5. a) Explain three-state bus buffer with pictorial diagram.
b) Explain 4-bit adder subtractor with pictorial diagram. 4+6