Q. Code:246131

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2023

Fifth Semester

EC18503– COMPUTER ORGANIZATION AND DESIGN

(Electronics and Communication Engineering)

(Regulation 2018)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Compute the performance of various computer architecture and to interpret the instruction set of MIPS processor.	**4**
CO 2	Design and construct various arithmetic circuits for an Arithmetic and Logic units of computing systems.	**4**
CO 3	Assessing various pipelining techniques to implement it for better data-path construction for control units of computing systems.	**3**
CO 4	Categorize various paralleling process techniques and its challenges and also to distinguish various multithreading techniques.	**3**
CO 5	Organize the different memory technologies and I/O systems to be preferred for computer architectural design.	**4**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Draw the structure of 'I' format of MIPS instructions and explain.	**1**	**2**
2.	Define CPI.	**1**	**1**
3.	Subtract $(11010)_2$ - $(10000)_2$ using 1's complement and 2's complement.	**2**	**3**
4.	Justify the need for sub word parallelism in computing system.	**2**	**3**
5.	What are the elements used to fetch instructions and increment the PC?	**3**	**2**
6.	What is pipelining?	**3**	**1**
7.	What are multicore processors?	**4**	**1**
8.	State the challenges of parallel processing.	**4**	**2**
9.	List the levels of memory hierarchy.	**5**	**2**
10.	What is virtual memory?	**5**	**1**

PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11. (a)	What is an addressing mode in a computer? Describe the MIPS addressing modes with suitable examples to each category.	**(14)**	**1**	**3**

(OR)

(b)	Illustrate the Eight great ideas with one example for each.	**(14)**	**1**	**3**
12. (a)	Explain in detail about floating point addition with example.	**(14)**	**2**	**3**

(OR)

(b)	Discuss in detail about non restoring division algorithm in detail with diagram and examples.	**(14)**	**2**	**3**
13. (a)	Design a simple data path with the control unit and explain the execution of R type instructions format.	**(14)**	**3**	**3**

(OR)

(b)	Describe the pipeline hazards and the various techniques used to overcome the hazards in detail.	**(14)**	**3**	**3**
14. (a)	Demonstrate the different classes of hardware multi-threading with necessary diagrams.	**(14)**	**4**	**3**

(OR)

(b)	Categorize the computers based on Flynn's classification with necessary diagrams.	**(14)**	**4**	**3**
15. (a)	Discuss the different mapping techniques used in cache memories and their relative merits and demerits.	**(14)**	**5**	**3**

(OR)

(b)	Discuss in detail the ways for improving cache performance.	**(14)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Solve the following using restoring division algorithm. Dividend(Q) =$(12)_{10}$ Divisor (M)= $(4)_{10.}$	**(10)**	**2**	**5**

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