Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Science

End Sem (Even) Examination May-2019

CA3CO06 Computer Architecture

Programme: BCA Branch/Specialisation: Computer Application

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. The brain of any computer system is **1**
(a) ALU (b) Memory (c) CPU (d) Control Unit

ii. The basic operations performed by a computer are **1**
(a) Arithmetic operation (b) Logical operation
(c) Storage and relative (d) All of these

iii. Booth's algorithm is used for multiplying **1**
(a) Only positive operands
(b) Both positive and negative operands
(c) Only when the multiplier is positive
(d) None of these

iv. The signed magnitude representation for -6 is **1**
(a) 1110 (b) 0110 (c) 0001 (d) 1001

v. How many types of micro-operations **1**
(a) 2 (b) 4 (c) 6 (d) 8

vi. Which language is termed as the symbolic depiction used for indicating the series **1**
(a) Random transfer language
(b) Register transfer language
(c) Arithmetic transfer language
(d) All of these

vii. Which is not part of the execution unit (EU) **1**
(a) Arithmetic logic unit (b) Clock
(c) General registers (d) Flags

P.T.O.

viii. The intel 8086 microprocessor is a _____ processor. **1**
(a) 8 bit (b) 16 bit (c) 32 bit (d) 4 bit

ix. In the memory hierarchy the fastest memory is **1**
(a) SRAM (b) Cache (c) Registers (d) DRAM

x. Type of memory which is used to read data but not to write on it is classified as **1**
(a) Random only memory (b) Read access memory
(c) Read only memory (d) Random access memory

Q.2 Attempt any two:

i. Define computer. Classify computer according to the Flynn's. **5**

ii. Explain any five addressing modes of computer with example. **5**

iii. Discuss in brief about generation of computers. **5**

Q.3 i. Perform the following **4**
(a) (+25) + (30)
(b) (-18) - (+12)
(c) 1101 * 101
(d) $(0.7462 * 10^{3)} + (0.5641 * 10^{2)}$

ii. Multiply (+12) and (-8) using Booth's algorithm. **6**

OR iii. Perform 12/3 using restoring division algorithm. **6**

Q.4 Attempt any two:

i. Define: - **5**
(a) Micro-Operation (b) Register Transfer Language

ii. Design a 4-bit combinational circuit incrementor using four Half adder circuits. **5**

iii. Define Arithmetic Logic Unit (ALU). Explain the hardware implementation of it along with function table. **5**

Q.5 i. Explain the physical address formation in 8086. **2**

ii. Draw and discuss the internal block diagram of 8086. **8**

OR iii. Explain the function of the following signals of 8086 **8**
(a) ALE (b) READY (c) HOLD (d) (BHE)'

Q.6 i. What is the objective of paging? **2**

ii. What are the differences among EPROM, EEPROM and Flash memory. Write any 3 differences. **3**

iii. Consider the following page address trace generated by a two–level (M1-M2) memory scheme using page system. The M1 has the capacity of four page: **5**
6 4 5 1 4 3 2 1 2 1 4 6 7 4
Assuming the M1 has pages 1,2,3, and 4 initially. Show the trace using
(a) LRO (b) FIFO

OR iv. (a) State why cache memory is always be smaller than main memory. **5**
(b) Explain access time, memory cycle time and data transfer rate of memory system.

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Marking Scheme
CA3CO06 Computer Architecture

Q.1	i.	The brain of any computer system is (c) CPU		**1**
	ii.	The basic operations performed by a computer are (d) All of these		**1**
	iii.	Booth's algorithm is used for multiplying (b) Both positive and negative operands		**1**
	iv.	The signed magnitude representation for -6 is (a) 1110		**1**
	v.	How many types of micro-operations (b) 4		**1**
	vi.	Which language is termed as the symbolic depiction used for indicating the series (b) Register transfer language		**1**
	vii.	Which is not part of the execution unit (EU) (b) Clock		**1**
	viii.	The intel 8086 microprocessor is a _____ processor. (b) 16 bit		**1**
	ix.	In the memory hierarchy the fastest memory is (c) Registers		**1**
	x.	Type of memory which is used to read data but not to write on it is classified as (c) Read only memory		**1**
Q.2		Attempt any two:		
	i.	Definition of computer	1 mark	**5**
		Classification computer according to the Flynn's.		
		1 mark for each (1 mark * 4)	4 marks	
	ii.	Any five addressing modes of computer		**5**
		0.5 mark for each (0.5 mark * 5)	2.5 marks	
		Example.		
		0.5 mark for each (0.5 mark * 5)	2.5 marks	
	iii.	Generation of computers.		**5**
		1 mark for each	(1 mark * 5)	
Q.3	i.	Perform the following 1 mark for each	(1 mark * 5)	**4**
	ii.	Booth's algorithm.		**6**
OR	iii.	Restoring division algorithm.		**6**
Q.4		Attempt any two:		
	i.	Define 2.5 marks for each	(2.5 marks * 2)	**5**
	ii.	Design a 4-bit combinational circuit	3 marks	**5**
		Explanation	2 marks	
	iii.	Define Arithmetic Logic Unit (ALU)	1 mark	**5**
		Hardware implementation	1 mark	
		Functional table.	2 marks	
		Description	1 mark	
Q.5	i.	Physical address formation in 8086.		**2**
	ii.	Internal block diagram of 8086.	3 marks	**8**
		Description of blocks	5 marks	
OR	iii.	Function of signals of 8086		**8**
		2 marks for each	(2 marks * 4)	
Q.6	i.	Objective of paging		**2**
	ii.	Differences among EPROM, EEPROM and Flash memory.		**3**
		1 mark for each difference	(1 mark * 3)	
	iii.	(a) LRO	2.5 marks	**5**
		(b) FIFO	2.5 marks	
OR	iv.	(a) State why cache memory is always be smaller than main memory.	2 marks	**5**
		(b) Access time,	1 mark	
		Memory cycle time	1 mark	
		Data transfer rate of memory system.	1 mark	

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