Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Science

End Sem (Odd) Examination Dec-2019

BC3CO10 Computer Organization

Programme: B.Sc. (CS) Branch/Specialisation: Computer Science

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. World's first digital computer was _____. **1**
(a) ENIAC (b) IBM PC (c) Pentium (d) Super Computer

ii. _____ is a communication pathway connecting two or more devices. **1**
(a) Keyboard (b) Mouse (c) Memory (d) Bus

iii. The control logic is implemented using gates, flip flops, decoders in, **1**
(a) Micro-programmed control
(b) Timing control
(c) Hardwired control
(d) Macro control

iv. A microprocessor system has _____ address bus. **1**
(a) Uni-directional (b) Daisy chain
(c) Bi-Directional (d) None of these

v. Speed of data transfer can be increased by using, **1**
(a) DMA controller (b) Interrupt
(c) Programmed I/O (d) Polling

vi. In _____ I/O, there is a single address space for memory locations and I/O devices. **1**
(a) I/O mapped (b) Memory mapped
(c) Single mapped (d) Couple mapped

vii. The address sends by processor and address used in program are referred to as **1**
(a) Virtual & Physical (b) Cache & Main
(c) Physical & Virtual (d) Actual & Virtual

P.T.O.

viii. The correspondence between the main memory blocks and those in the cache is given by **1**
(a) Mapping function (b) Block function
(c) Cache function (d) Assign function

ix. Program Counter holds the address of, **1**
(a) Current Instruction (b) Count of instruction
(c) Data to be fetched (d) Next instruction to be fetched

x. The overflow flag bit in Program Status Word register indicates, **1**
(a) Result overflow (b) Arithmetic overflow
(c) Register overflow (d) None of these

Q.2 Attempt any two:
i. Explain various functional units of a computer system? **5**
ii. What are different types and use of System software? **5**
iii. What is speedup? Explain Amdhal's Law. **5**

Q.3 i. Define Opcode and Operand. **4**
ii. What is the need of computer registers and explain how computer registers are connected with common Bus system? **6**
OR iii. Explain Instruction Fetch and Decode with suitable diagram. **6**

Q.4 i. What is the disadvantage of programmed I/O? **3**
ii. How interrupt driven input/output system works? **7**
OR iii. Explain block diagram of DMA controller. **7**

Q.5 i. Explain virtual memory organization with virtual and physical address translation process. **4**
ii. Compare fully associative, direct-mapped and set associative cache memories. **6**
OR iii. Explain various page replacement algorithms? **6**

Q.6 i. Mention various segment registers in 8086 microprocessors with purpose of each. **2**
ii. Define machine cycle, instruction cycle and T state. **3**
iii. What are various pipeline hazards? Explain with suitable example. **5**
OR iv. How pipelining is implemented in Pentium? **5**

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Marking Scheme
BC3CO10 Computer Organization

Q.1	i.	World's first digital computer was _____. (a) ENIAC		**1**
	ii.	_____ is a communication pathway connecting two or more devices. (d) Bus		**1**
	iii.	The control logic is implemented using gates, flip flops, decoders in, (c) Hardwired control		**1**
	iv.	A microprocessor system has _____ address bus. (a) Uni-directional		**1**
	v.	Speed of data transfer can be increased by using, (a) DMA controller		**1**
	vi.	In _____ I/O, there is a single address space for memory locations and I/O devices. (b) Memory mapped		**1**
	vii.	The address sends by processor and address used in program are referred to as (c) Physical & Virtual		**1**
	viii.	The correspondence between the main memory blocks and those in the cache is given by (a) Mapping function		**1**
	ix.	Program Counter holds the address of, (d) Next instruction to be fetched		**1**
	x.	The overflow flag bit in Program Status Word register indicates, (b) Arithmetic overflow		**1**
Q.2		Attempt any two:		
	i.	Functional units of a computer system		**5**
		Explanation	3 marks	
		Diagram	2 marks	
	ii.	Types of System Software	2.5 marks	**5**
		Use of System Software	2.5 marks	
	iii.	Speedup definition with formula	2 marks	**5**
		Amdahl's Law statement	1.5 marks	
		Amdahl's Law formula	1.5 marks	
Q.3	i.	Opcode definition	2 marks	**4**
		Operand definition	2 marks	
	ii.	List of computer registers with their use	3 marks	**6**
		Diagram showing registers connected to common Bus	3 marks	
OR	iii.	Steps to fetch instruction and then decode	4 marks	**6**
		Diagram	2 marks	
Q.4	i.	Disadvantage of programmed I/O		**3**
		1 mark for each point	(1 mark * 3)	
	ii.	Mention steps of interrupt driven I/O	5 marks	**7**
		Suitable diagram	2 marks	
OR	iii.	DMA controller		**7**
		Explanation	3 marks	
		Diagram	4 marks	
Q.5	i.	Diagram of virtual memory	1 mark	**4**
		Explanation	1 mark	
		Address translation process	2 marks	
	ii.	Compare fully associative, direct-mapped and set associative cache memories.		**6**
		2 marks for each difference	(2 marks * 3)	
OR	iii.	Page replacement algorithms		**6**
		Explanation	4 marks	
		Example	2 marks	
Q.6	i.	Segment registers in 8086 microprocessors with purpose of each Following segment registers with their use		**2**
		0.5 mark for each	(0.5 mark * 4)	
	ii.	Define machine cycle, instruction cycle and T state.		**3**
		1 mark for each definition	(1 mark * 3)	
	iii.	Pipeline Hazards explanation	2 marks	**5**
		Diagram	2 marks	
		Example	1 mark	
OR	iv.	How pipelining is implemented in Pentium		**5**
		Explanation	2.5 marks	
		Diagram	2.5 marks	

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