

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), Nov.-Dec. 2015

B. Tech in Computer Science & Engineering, Semester VII Sem

Roll No.....

CSE733: Parallel Processing

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A	Objective type multiple choice questions (10 questions @ 1 mark)	10
i.	A memory shared by many processors to communicate among is termed as – a) Multiport memory b) Multiprocessor memory. c) Multilevel memory. d) Multidevice memory.	
ii.	A switching system for accessing memory modules in a multiprocessor is called – a) Combining n/w. b) Combining processors. c) Combining devices. d) Combining cables.	
iii.	 is the first super computer produced by India. a)PARAM b)Intel 5000 c)super India d)none of these	
iv.	SIMD stands for – a)Single Instruction Multiple Data stream b)Synchronous Instruction Multiple Data stream c)Single Interface Multiple Data stream d)Single Instruction Multiple Data signal	
v.	SISD is the example of – a)Distributed parallel processor system. b)Sequential system c)Multiprocessing system d)None of these	
vi.	VLIW is stand for – a)Variable length Instruction wall b)Vary large instruction word c)Vary long instruction word d)None of these	

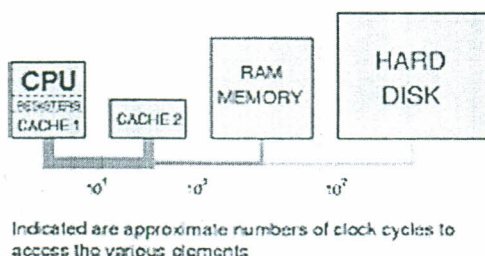
vii.	SIMD has following component – a)PE b)CU c)AU d)All of Above	
viii.	The ALU and control unit of most of the microcomputers are combined and manufactured on a single silicon chip. What is it called? a)Monochip b)Microprocessor c) ALU d) Control Unit	
ix.	A complete microcomputer system consist of – a)Microprocessor b)Memory c)Peripheral equipment d)All of above	
x.	CPU does perform the operation of – a)Data transfer b)Logic operation c)Arithmetic operation d)All of above	

Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
a.	Define Snoopy Protocol.	
b.	Differentiate tightly coupled SMP and loosely coupled clusters	
c.	Discuss content compression feature of web servers.	
d.	Router lies on which layer of TCP/IP Model.	

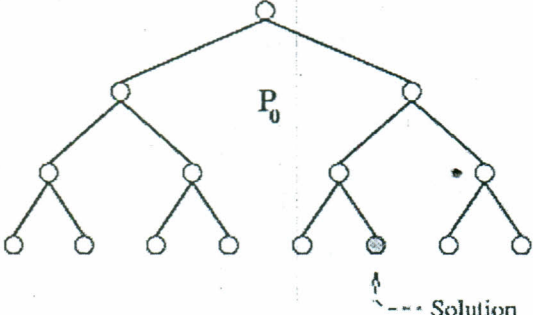
Q.3A	Discuss where are the computing resources located in grid and cloud computing? Illustrate principle behind Cloud Computing and Grid Computing.	05
Q.3B	Evaluate P2P topologies in terms of manageable, extensible, fault tolerant, secure and scalable?	05

Q.4A	Describe virtual hosting and Bandwidth throttling in case of web servers.	05
Q.4B	Explain various types of shared memory and distributed memory architecture.	05

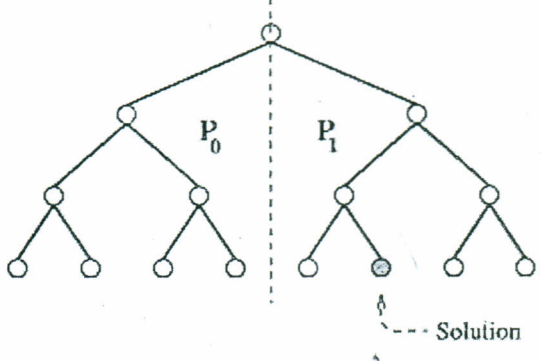
Q.5A	Explain Flynn's taxonomy of computer architecture using neat block diagram.	05
Q.5B	Illustrate what kind of information is carried in the following diagram under memory segmentation.	05



Q.6A	Give three reasons why cluster computing is gaining prominence.	05
Q.6B	What is the conclusion regarding parallelism stated by Amdahl's Law.	05
OR		
Q.6B	Explain various types of switching techniques available in interconnection networks.	05
Q.7A	Consider the following loop: for (i=0; i<N; i++) {job(i)}. Assume the execution time of job(i) = T seconds. If you create "P" processes (assume process overhead = H seconds per process) (i) What is the serial execution time with one process (ii) What is the serial execution time with P processes	05
Q.7B	Discuss the concept of "shared bus" in symmetric multiprocessor organization. Also mention advantages and disadvantages of time share bus.	05
OR		
Q.7B	Describe CC-NUMA architecture used in multi-processors.	05
Q.8	Mention three reasons why Backfilling mechanism is essential. Describe any of the backfilling approach used in parallel computing.	10
Q.9A	Consider the search tree shown in the following figure, in which the dark node represents the solution.	10



(a) DFS with one processor



(b) DFS with two processors

(a) If a sequential search of the tree is performed using the standard depth-first search (DFS) algorithm, how much time does it take to find the solution if traversing each arc of the tree takes one unit of time? Note: DFS begins by expanding the initial node and generating its successors. In each subsequent step, DFS expands one of the most recently generated nodes. If this node has no successors (or cannot lead to any solutions), then DFS backtracks and expands a different node.

(b) Assume that the tree is partitioned between two processing elements that are assigned to do the search job, as shown in figure b. If both processing elements perform a DFS on their respective halves of the tree, how much time does it take for the solution to be found? What is the speedup? Is there a speedup anomaly?

Q.9B	If we have a fixed area on which we can build one of the following two systems: - System 1 contains 16 in-order single-issue processors. - System 2 contains 4 out-of-order 4-wide superscalar processors.	10
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	Program P runs to completion on one of these processors in 50 seconds. When parallelized, 4 seconds have to be spent in serial execution, and the rest can be perfectly parallelized. Which of these two systems would you choose to run Program P?	
	OR	
Q.9B	Describe cache coherence in detail. Identify one advantage and one disadvantage of building an inclusive cache system (where an L2 cache has to contain all blocks in L1 caches of processors that share it).	10