ME (Comp Engg) (Choice based)

Sem II Sub: HPC.

20/11/17

T6432 / T330 HIGH PERFORMANCE COMPUTING

Q. P. Code: 25074

(3 Hours) [Total Marks 80]

N. B:

1. Question No. 1 is Compulsory.
2. Solve any THREE from Question No. 2 to 6.
3. Draw neat well labeled diagram wherever necessary.

Q. 1	a)	What is Message Passing Interface? What are the principles of Message Passing Programming?	10M
	b)	Define Network Topology and its types.	5M
	c)	Distinguish between loosely coupled and tightly coupled multiprocessors.	5M
Q. 2	a)	Write a MPI program for Prime Number Generation.	10M
	b)	Explain Granularity, Concurrency and Dependency Path.	10M
Q. 3	a)	Explain about process synchronization mechanism with Semaphore.	10M
	b)	Short note on 'SIMD matrix multiplication'.	10M
Q. 4	a)	State Amdahl's law.? Suppose a serial program reads n data from a file, performs some computation, and then writes n data back out to another file. The I/O time is measured and found to be 4500 + n μsec. If the computation portion takes n 2/200 μsec, what is the maximum speedup we can expect when n=10,000 and p processors are used?	10M
	b)	Explain the various levels of parallel processing.	10M
Q. 5	a)	Explain in brief Quantum Computers.	10M
	b)	What is a Data-Race? Why Data-Races are Undesired? How Data-Races Can be Prevented?	10M
Q. 6	a)	What is meant by grain packing and scheduling in parallel Processing?	5M
	b)	Explain the following : i. Data driven computers. ii. Data flow languages.	5M
	c)	Explain the pros and Cons of Open MP.	5M
	d)	Give the advantages in using non-uniform memory access model.	5M

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institude level