CBCS SCHEME

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17CS72

Seventh Semester B.E. Degree Examination, July/August 2022
Advanced Computer Architecture

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain different shared memory multiprocessor models. **(08 Marks)**

b. Explain PRAM model. **(06 Marks)**

c. What are different static interconnection networks? Explain any two networks. **(06 Marks)**

OR

2 a. Explain the Bernstein's conditions for parallelism. For the program statements given draw the dependence graph.
S1: A = B + D, S2: C = A × 3, S3: A = A + C, S4; E = A/2. **(10 Marks)**

b. Explain Amdahl's law. In a multi-processor system with 9 processors, the portion for parallel programming is 75% then calculate overall speedup. If number of processors is doubled and with same program conditions what is the new speed up. Use Amdahl's law to calculate the speed-up. **(10 Marks)**

Module-2

3 a. Explain with diagram general CISC and RISC architectures. **(10 Marks)**

b. Explain VLIW architecture with its instruction pipelining. **(10 Marks)**

OR

4 a. Explain different virtual memory models. **(10 Marks)**

b. What are different page-replacement policies? A certain program generates following page trace.
Page trace: 0 1 2 4 2 3 7 2 1 3 1
These pages are to be mapped on to three page frames (PF_S). Use LRU algorithm and show the pages residing in the page frames. Calculate the hit ratio. **(10 Marks)**

Module-3

5 a. With a diagram, explain backplane bus system. **(10 Marks)**

b. Explain sequential and weak consistency memory models. **(10 Marks)**

OR

6 a. Explain with diagram the asynchronous and synchronous models of linear pipeline processors. **(08 Marks)**

b. Explain arithmetic pipeline stages with an adder unit. **(06 Marks)**

c. What are different branch prediction methods? Explain briefly. **(06 Marks)**

Module-4

7 a. Explain cross bar network and cross-point switch design in a multiprocessor system. **(06 Marks)**

b. What is cache coherence problem in data sharing? Explain different causes for that. **(08 Marks)**

c. What are different vector access memory schemes? Explain any one. **(06 Marks)**

OR

8 a. What are the different latency hiding techniques? Explain two of them. **(10 Marks)**

b. Explain static, dynamic and pure dataflow machines. **(10 Marks)**

Module-5

9 a. What are different programming models? Explain message-passing model. **(08 Marks)**

b. Explain the compilation phases in parallel computing environment with a diagram. **(06 Marks)**

c. Explain testing algorithm with dependence test. **(06 Marks)**

OR

10 a. What are the different synchronization schemes in multiprocessor system? Explain any two of them. **(10 Marks)**

b. Explain the following terms in parallel architecture:

i) Operand Forwarding

ii) Reorder buffer. **(10 Marks)**

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