

Reg. No.

Question Paper Code

11968

07 JUL 2023

M.E. / M.Tech. - DEGREE EXAMINATIONS, APRIL/MAY 2023

First Semester

M.E - Computer Science and Engineering

20PCNPC101 - ADVANCED COMPUTER ARCHITECTURE

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |  | <i>Marks,<br/>K-Level, CO</i> |
|--|-------------------------------|
| 1. Explain various types of Dependencies in ILP.     | 2,K1,CO1                      |
| 2. Define Data Hazards.                              | 2,K1,CO1                      |
| 3. What are the Techniques used to reduce Miss rate. | 2,K1,CO2                      |
| 4. Define Principle of locality.                     | 2,K1,CO2                      |
| 5. Examine about invalidate protocol.                | 2,K1,CO3                      |
| 6. Define Coherent view of memory.                   | 2,K1,CO3                      |
| 7. Classify the elements of Interconnect Bus.        | 2,K3,CO4                      |
| 8. Give the potential Drawbacks of Cloud Computing.  | 2,K2,CO4                      |
| 9. Analyze the Vector functional units.              | 2,K1,CO5                      |
| 10. Generalize the output dependency.                | 2,K1,CO6                      |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Discuss about multiple instruction issue using dynamic scheduling. 13,K2,CO1
- OR**
- b) Discuss how hardware based speculation is used to overcome control dependence. 13,K2,CO1
12. a) Explain cache hit time, miss rate and miss penalty with an example and present an outline of Virtual memory and virtual machines. 13,K2,CO2
- OR**
- b) What is memory hierarchy? Elaborate the level in memory hierarchy with a diagram. 13,K2,CO2
13. a) What the Basic Hardware Primitives and discuss the Coherence Protocols. 13,K1,CO3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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**OR**

b) Explain Synchronization and Classify Multicomputer from Multiprocessors. *13,K3,CO3*

14. a) (i) Describe the Monitoring and Repair elements of a Google WSC. *7,K3,CO4*  
(ii) Explain the Physical Infrastructure and Costs of Warehouse- Scale Computers. *6,K1,CO4*

**OR**

b) (i) Explain Google Warehouse-Scale Computer. *7,K3,CO4*  
(ii) Explain the customized and standardize 1AAA container for Google. *6,K3,CO4*

15. a) Develop in detail about Roofline Visual Performance model. *13,K2,CO*

**OR**

b) Summarize the elements of Graphics processing Units. *13,K2,CO5*

**PART - C (1 × 15 = 15 Marks)**

16. a) Describe the primary components of the instruction set architecture of VMIPS. *15,K2,CO6*

**OR**

b) Discuss the concept of Multiple Lanes: Beyond One Element per Clock Cycle. *15,K2,CO6*