14682

B. Tech 4th Semester Examination

Computer Architecture (O.S.)

IT (ID)-4001

Time : 3 Hours   **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : (i) Section A, B, C and D will have two questions.

       (ii) Attempt any four questions in all selecting one questions from each of sections A, B, C and D of question paper.

       (iii) Section E is mandatory.

SECTION - A

1. (a) Define computer architecture. Explain different technologies used for computer.

     (b) Explain details about measuring and reporting performance of any computer with suitable examples.

                                       (5+10=15)

2. (a) Discuss briefly about encoding an instruction set and memory addressing.

     (b) Discuss briefly quantitative principles of computer design.

                                       (5+10=15)

SECTION - B

3. (a) What is pipelining? What makes pipelining hard to implement?

(b)   Explain the concepts and challenges of instruction-level parallelism.   (5+10=15)

4. (a)   Discuss basic pipeline for DLX.

(b)   What are basic compiler techniques used for exposing ILP?   (7+8=15)

SECTION - C

5. (a)   What is cache memory? What are procedures to protect memory?

(b)   Discuss briefly about buses connecting I/O devices to CPU memory with suitable diagrams. Explain about RAID.
                    (5+10=15)

6. (a)   How to reduce cache misses? Compare between cache and virtual memories.

(b)   How to measures I/O performances? Discuss briefly about UNIX file system performance.   (5+10=15)

SECTION - D

7. (a)   How to establish connection the interconnection network to computer? What are characteristics of applications domains of multiprocessors?

(b)   Explain centralized shared memory architectures with suitable diagrams. What is simple network interconnections?   (7+8=15)

8. (a)   What are practical issues for commercial interconnection networks with suitable examples. How to establish connection the interconnection network media?

(b)   How to achieve synchronization in multiprocessors computer? Discuss about distributed shared memory architectures.   (7+8=15)

SECTION - E

9. (a) Describe Von-Neumann architecture in detail.

   (b) What is pipelining? How does it improve performance?

   (c) Explain basic instruction types with examples .

   (d) What is DMA ? Describe how DMA is used to transfer Data from peripherals.

   (e) Explain various RAID levels.

   (f) Draw and explain fully associative cache organization.

   (g) What are Data hazards? Explain the techniques used to minimize Data Hazards.

   (h) What is meant by dynamic branch prediction? Discuss the operation of a two bit dynamic branch predictor.

   (i) Define cache memory. Explain any two mapping process followed in cache memory.

   (j) Draw and explain the virtual memory organization.

                                                        (10×4=40)