Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 45917

5 Year M.Sc. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Second Semester

Software Engineering

XIT 121/10677 SW 204 — COMPUTER ARCHITECTURE

(Common to 5 year M.Sc. Information Technology)

(Regulation 2003/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the two techniques used to increase the clock rate R?
2. What are big-endian and little-endian representations?
3. What is bit pair recoding? Give an example.
4. When can you say that a number is normalized?
5. What is the WMFC step needed when reading from or writing to the main memory?
6. Differentiate horizontal microinstruction and vertical microinstruction.
7. What will be the width of address and data buses for a 512K * 8 memory chip?
8. Give the format for main memory address using associative mapping function for 4096 blocks in main memory and 128 blocks in cache with 16 blocks per cache.
9. Why I/O devices cannot be directly be connected to the system bus?
10. What is the need of interrupt controller

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are stack and queues? Explain their use and give their differences. (8)

(ii) Explain Zero, one, two and three addressing instructions with example. (8)

Or

(b) (i) Describe the addressing modes for accessing memory content. (8)

(ii) What are the issues you will consider while designing the ISA of a processor? Explain. (8)

12. (a) (i) Discuss the principle of operation of carry–look ahead adders. (8)

(ii) Discuss the non-restoring division algorithm Simulate the same for 23/5. (8)

Or

(b) (i) Design a multiplier that multiplies two 4-bit numbers. (6)

(ii) Explain the working of floating point adder and subtractor. (10)

13. (a) Give the organization of typical hardwired control unit and explain the functions performed by the various blocks.

Or

(b) Discuss the various hazards that might arise in a pipeline. What are the remedies commonly adopted to overcome/minimize these hazards.

14. (a) Give the structure of semiconductor RAM memories. Explain the read and write operations.

Or

(b) (i) Explain the concept of virtual memory with one virtual memory management Technique. (8)

(ii) Give the basic cell of an associative memory and explain its operation. Show how associative memories can be constructed using this basic cell. (8)

15. (a) Explain the use of vectored interrupts in processes. Why is priority handling desired in interrupt controllers? How does the different priority scheme work?

Or

(b) Describe the functions of SCSI with a neat diagram.

———————