POKHARA UNIVERSITY

Level: Bachelor | Semester – Spring | Year : 2011
Programme: BE | Full Marks: 100
Course: Computer Organization and Architecture | Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a. What are the different types of instructions? Explain with example. 8
   b. Design the 16 × 2 memory subsystem using: 7
   i. internal linear configuration ii. two dimensional configuration.
2. a. What is DMA? Explain the different register section within a DMA, explain their uses. 8
   b. What is RTL? Write the RTL for different logical operations. Design a 4-bit decimal left shifting circuit. 7
3. a. Design a very simple CPU with the following instruction set and show the RTL code for execute cycle for each instruction: 8

Instruction	Instruction Code	Operation
SHL	00AAAAAA	AC←AC +AC
AND	01AAAAAA	AC←AC ^ M[AAAAAA]
OR	10AAAAAA	AC←AC v M[AAAAAA]
NEG	11XXXXXX	AC←AC'+1

   b. From the above table also design the ALU and Hardwired control unit for the very simple CPU. 7
4. a. Describe the microinstruction format. Explain the advantages and disadvantages of horizontal and vertical microcode. 8
   b. What are the features distinguish RISC processors from their CISC processor? Explain. 7
5. a. Write the RTL code for the Booths' Algorithm. 7
   b. What is memory hierarchy? Explain the importance of cache memory and virtual memory in hierarchy. 8
6. a. Why we used asynchronous data transfer mechanism? Explain Programmed I/O with examples. 8
   b. Describe different system topologies used to organize multiprocessors. 7
7. Write short notes on **any two:** 2×5
   a. MIMD architecture
   b. VHDL
   c. Register window