

Thapar Institute of Engineering & Technology, Patiala
End Semester Test

Course Code: CS-004

Date: 16/12/06

Course Name: Computer System Architecture

Time Allowed: 3 Hr.

Max. Marks: 100

Note : Attempt **any five** questions

Only first five answers will be evaluated

All parts of a question should be attempted at the **same place**.

- Q1.a) Explain various addressing modes with examples. (10)
- b) Explain encoder, decoder, multiplexer and de-multiplexer along with one example of each. (10)
- Q2.a) What is Direct Memory Access ? Explain its functioning in detail. (5)
- b) Represent the following arithmetic expression in reverse polish notation and diagrammatically perform the stack operation on it
- $$(3 * 4) + (5 * 6) \quad (5)$$
- c) Explain control unit of basic computer in detail. (10)
- Q3.a) A digital computer has a memory unit of 64K X 16 and a cache memory of 1K words. The cache uses direct mapping with a block of four words.
- i) How many bits are there in the tag, index, block size and word field of the address format? (2)
- ii) How many bits are there in each word of cache. Include a valid bit. (1)
- b) A computer employs RAM chips of 256 X 8 and ROM chips of 1024 X 8. The computer system needs 2K bytes of RAM, 4K bytes of ROM and four interface units, each with four registers. A memory-mapped I/O configuration is used. The Highest-order bits of the address bus are assigned 00 for RAM, 01 for ROM & 10 for interface registers.
- i) How many ROM & RAM chips are needed. (1)
- ii) Draw a memory address map for the system. (2)
- iii) Give the address range in hexadecimal for RAM, ROM and interface. (2)
- b) Give the flow chart for addition and subtraction operation. (12)
- Q4 Explain all the CPU instructions in detail with examples. (20)

Q5.

Write short notes on :

(20)

- a) IOP
- b) Pipelining
- c) External & internal interrupts
- d) RISC & CISC architecture