Roll No. .....

Total Pages : 03

GSM/D-23 1129

COMPUTER ARCHITECTURE

BCA-233

Time : Three Hours] [Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. Write short notes on the following : 8×2=16

(a) Instruction format

(b) Hardwired control and Microprogrammed control

(c) Control Memory Address Register

(d) High Impedance State

(e) Explain the addressing mode where the address of the operand lies inside the instruction.

(f) Program Counter

(g) Virtual Memory

(h) Why is Cache Memory needed for execution ?

Unit I

2. Explain the followings with suitable example :

(a) Instruction Cycle 8

(b) Memory Reference Instructions. 8

3. (a) What is the difference between a direct and an indirect address instruction ? How many reference to memory are needed for each type of instruction to bring an operand into a processor register ? 8

(b) A Computer uses a memory unit with 256K words of 32 bit each. A binary instruction code is stored in one word of memory. The instruction has four parts : an indirect bit, an operation code, a register code part to specify one of 64 registers and an address part. 8

(i) How many bits are there in the operation code, the register code part and the address pat ?

(ii) Draw the instruction word format and indicate the number of bits in each part.

(iii) How many bits are there in the date and address inputs of the memory ?

Unit II

4. (a) What do you mean by Bus and Memory Transfer ? Explain with suitable example. 8

(b) What is a microprogram sequencer ? Explain the working of microprogram sequencer. 8

5. What do you understand by Micro Operation ? Explain all categories of Micro Operations in detail. 16

Unit III

6. What do you mean by instruction format ? Describe various types of instruction format with suitable example. 16

7. (a) What do you mean by stack ? How is stack implemented in a general microprocessor system ? Explain various operations on it. 8

   (b) What do you mean by program control instructions ? Explain, how the status register containing overflow, zero, sign and carry flags works with the status of the accumulator content obtained from ALU. 8

Unit IV

8. Write notes on the following :

   (a) Auxiliary Memory 8

   (b) Associative Memory. 8

9. (a) What do you understand by interrupt ? Explain the steps through which processor handles the interrupts. 8

   (b) What is DMA ? Give an example where DMA mode of data transfer is useful. 8