COMPUTER ARCHITECTURE AND ORGANISATION

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No.1 and any *four* from the rest.

1. (a) State true or false :   1×5=5

   (i) The ALU unit of a computer can perform all types of arithmetic operations.

   (ii) Assembly programs are written using mnemonics.

   (iii) DMA based data transfer is slower than interrupt driven data transfer.

   (iv) DRAM needs to be refreshed quite frequently.

   (v) In indirect address the address part points to address of actual data.

(b) Fill up the blanks :   1×5=5

(i) Micro-instructions are kept in ——— .

(ii) ——— memory is used in a computer system to speed-up memory access.

(iii) A CPU whose program counter has 24 bits can address at least ——— words of storage.

(iv) On getting an ———, CPU immediately moves to interrupt service routine without co.

(v) The size of program counter should be same as size of ——— .

2. (a) Explain briefly the DMA transfer scheme. 7

(b) What is the function of Conrol Unit ? Explain Hardwired Control Unit with the help of a neat diagram.   8

3. (a) Explain Booth's algorithm to multiply two numbers in 2's complement form. Use the algorithm to multiply 15 decimal with 13 decimal.   10

(b) Differentiate between cache memory and virtual memory.   5

4. (a) What do you mean by RISC ? Explain briefly the main characteristics of RISC processor. 8

   (b) Give the merits and demerits of the floating point and fixed point representations for storing real numbers. 7

5. (a) What do you mean by addressing mode ? Discuss different types of Instruction formats in detail. 10

   (b) Give a brief description of Assembly language. 5

6. (a) Define r's complement and (r-1)'s complement. Explain with the help of one example how we can use complement to perform subtraction operation. 7

   (b) Convert the following numbers : 8

   (i) 10101.101 binary to decimal

   (ii) 265.45 decimal to binary

   (iii) 2DF hexadecimal to octal

   (iv) 101111110011 binary to hexadecimal.

7. Write short notes on any *three* : 5×3=15

   (i) Microprocessor

   (ii) Instruction Cycle

   (iii) EBCDIC

   (iv) PC Architecture

   (v) Logic Gates

   (vi) Register.