UG/II/CSC/H/IV/18 (New)

2018

COMPUTER SCIENCE

[Honours]

PAPER – IV

Full Marks : 100

Time : 4 hours

The figures in the right hand margin indicate marks

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

Illustrate the answers wherever necessary

[NEW SYLLABUS]

GROUP–A

Answer any two questions : 15 × 2

1. (*a*) Explain immediate, register indirect and stack addressing modes with examples.

(*b*) Write down the task of ALE, HOLD and IO/$\overline{M}$ signals of 8085 microprocessor.

(*c*) What are the functions of Literal table, Machine operation table and pseudo-operation table of a two pass assembler ? 5 + 5 + 5

2. (*a*) Describe the Booth's multiplication method.

(*b*) Multiply decimal number $(-23)_{10}$ and $(9)_{10}$ using the above method.

(*c*) Draw the timing diagram for execution of MOV A, M instruction. 5 + 5 + 5

3. (*a*) What do you mean by fetch cycle and instruction cycle ?

(*b*) What is *T*-state ? Calculate *T*-state time if frequency of microprocessor clock is 6 MHz.

(*c*) What is timing diagram ?

(*d*) Draw a timing diagram for the instruction MOV M, C. (2 +2) + (2 + 2) + 2 + 5

4. (*a*) Draw and explain the internal architecture of 8085 microprocessor.

(*b*) A computer has a main memory of 64K × 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 and word fields of the address format ?

(*ii*) How many bits are there in each word of cache ?

(*c*) Distinguish dynamic loading and dynamic linking. 5 + 5 + 5

GROUP – B

Answer any **five** questions : 8 × 5

5. (*a*) Define the parameter bandwidth and speed.

(*b*) What is the memory capacity of a hard disk having 10 disk, each disk layer have 300 track, each track have 50 sectors. Each sector can able to contain 100 KB data.

(*c*) Why CD tracks are spiral rather than circular ? (2 + 2) + 2 + 2

6. (*a*) Write an assembly language program for 8085 microprocessor to add two 16 bit numbers without using DAD instruction.

(*b*) Compare CISC and RISC computer architecture. 4 + 4

7. A memory structure is required of 1K × 8 RAM and 512 × 8 ROM using 512 × 8 RAM ICs and 12 × 4 ROM ICs. All structure will be controlled by 16 bit CPU.

(*i*) How many ROM & RAM ICs are required ?

(*ii*) How many address lines are required ?

(*iii*) Draw the block diagram of that memory structure.

(*iv*) Give the memory map for that structure. 1 + 1 + 3 + 3

8. (*a*) What is base-index addressing mode ?

(*b*) Show the execution of,

$$X = (A + B) - C/D$$

using three, two and one address mode. $2 + (2 \times 3)$

9. (*a*) What is loader ? What are the functions of it ?

(*b*) Explain relocating loader. $4 + 4$

10. (*a*) Compare I/O and memory mapped I/O.

(*b*) Evaluate $X = (A + B) - (C + D)$ using one and zero address instructions. $4 + 4$

11. (*a*) Explain bits of flags of a 8085 μp.

(*b*) Explain XCHG and RRC instruction of 8085 μp.

(*c*) Arrange hardwire interrupts of 8085 μp according to their priority. $4 + 2 + 2$

12. (*a*) Write an assembly language program to calculate square root of a number using look up table.

(*b*) Draw the block diagram of 8254 processor. $4 + 4$

GROUP – C

Answer any five questions : 4×5

13. (*a*) What are the difference between hardwire and microprogrammed control units ?

    (*b*) What is CMBR ? $3 + 1$

14. (*a*) Give the bit pattern of SIM.

    (*b*) What is the SIM if only RST 7·5 is enable interrupt ? $3 + 1$

15. Distinguish SRAM and DRAM. 4

16. (*a*) What is cross-assembler.

    (*b*) What is the difference between compiler and interpreter ? $2 + 2$

17. (*a*) Explain BSR of 8085 µp using bit pattern

    (*b*) What is BSR value if PC_3 is to be Set ? $3 + 1$

18. (*a*) Draw the input block diagram of pin configuration (PA, PB & PC) of 8255 IC in Mode 1.

(*b*) What are the modes of 8255 IC ? 3 + 1

19. Explain the following 8085 instructions : 4

(*i*) PCHL

(*ii*) STAX

(*iii*) XCHG

(*iv*) XTHL.

20. (*a*) What is the function of stack pointer and program counter ?

(*b*) What is fold back memory ? 2 + 2

[*Internal Assessment* – 10 Marks]