Total No. of printed pages = 6

END SEMESTER/RETEST EXAMINATION–2019

Semester : 3rd (New)

Subject Code : CO-303

COMPUTER ARCHITECTURE AND ORGANIZATION

Full Marks – 70

Time – Three hours

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

Instructions :

1. Questions on PART–A are compulsory.
2. Answer any *five* questions from PART–B.

PART – A

Marks – 25

1 Fill in the blanks : 1×10=10

(a) The number of AND gates required to realize Y = CD + EF + GC is _____.

[Turn over

(b) The NOR gate output will be high if the two inputs are _____.

(c) 4 to 1 MUX would have _____ output.

(d) The term used to define all input and output devices in a computer system is _____.

(e) _____ is generally used to increase the apparent size of physical memory.

(f) PROM stands for _____.

(g) The two major types of control organization are hardwired control unit and _____ control unit.

(h) The most efficient method followed by computers to multiply two signed numbers is by using _____ Algorithm.

(i) DMA stands for_____.

(j) The process where in the processor constantly checks the status flags is called as _____.

2 Write true or false : 1×10=10

(a) In D flip-flop, D stands for Delay.

(b) An encoder is called as multiplexer.

(c) The memory which has the lowest access time in memory hierarchy is the registers.

(d) The usual BUS structure used to connect the I/O devices is Star Bus structure.

(e) The registers used to store the flags are called as Status registers.

(f) In memory-mapped I/O, the I/O devices and the memory share the same address space.

(g) To reduce the memory access time we generally make use of Secondary memory.

(h) Light pen is an example of software.

(i) Interrupts initiated by an instruction is called as Hardware Interrupt.

(j) 1 Kilobyte is equal to 1024 MB.

3. Choose the correct answer : 1×5=5

(a) Which memory device is generally made of semi-conductors ?

(i) RAM (ii) Hard disk

(iii) Floppy disk (iv) C D

(b) A universal logic gate is

(i) AND (ii) XOR

(iii) NAND (iv) OR

(c) The instructions like MOV or ADD are called as

(i) OP Code

(ii) Operators

(iii) Commands

(iv) None of the mentioned above.

(d) The addressing mode, where you directly specify the operand value is

(i) Direct (ii) Immediate

(iii) Definite (iv) Relative Registers

(e) The ALU makes use of _____ to store the intermediate results.

(i) Heap (ii) Registers

(iii) Accumulator (iv) Stack.

PART – B

Marks – 45

4. (a) Write truth tables for the following Logic gates :

(i) AND (ii) NAND 3

(b) Write briefly about Von-Neumann architecture. 3

(c) Draw the Logic circuit of the following :

(i) (AB + BC)Y + XYB

(ii) XY + YZ + ZX 3

5. (a) Draw the logic diagram of D flipflop and explain with the help of truth table. 4

(b) What do you mean by Floating point representation by computer system. 3

(c) Find the 2's complement form of the number 1000 1111. 2

6. (a) What are computer registers ? Name them and write their purposes. 4

(b) What are immediate and direct addressing mode ? 3

(c) Write briefly about one byte instructions. 2

7. (a) What do you mean by instruction format ? 3

(b) Write briefly about stack organization. 3

(c) Write briefly about Hardwired control unit. 3

8. (a) Differentiate between EPROM and PROM. 3

(b) Why cache memory is used ? Explain briefly about Memory Hierarchy. 6

9. (a) Write briefly about synchronous and asynchronous data transfer. 4

(b) Write brief note on any two output devices. 5

10. Explain Booth's algorithm to multiply two numbers in 2's complement form. Use Booth's algorithm to multiply –10 decimal with –12 decimal. 9

11. Explain briefly the DMA transfer scheme. How does DMA controller works ? 9

12. Explain briefly the working principle of

(a) Virtual memory

(b) Associative memory.

(c) Cache memory. 9