Total No. of printed pages = 7 **SET-B**

RETEST EXAMINATION - 2019

Semester : 3rd (New Syllabus)

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. *All* questions of 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 OR gates required to realize Y = CD + EF + GC is _____.

   (b) The NAND gate output will be high if the two inputs are _____.

   (c) _____ is a universal logic gate.

[Turn over

(d) The full form of AC_____.

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

(f) EPROM stands for _____.

(g) In memory hierarchy _____ are at the top level.

(h) The full form of DR is_____.

(i) Scanner is a _____ device.

(j) 1 Megabyte is equal to _____ KB.

2. Write true or false : 1×10=10

(a) The NOR gate is OR gate followed by NOT gate.

(b) Half adder is simple combinational digital circuit built from logic gates.

(c) A binary number with 8 bits is called byte.

(d) The Memory Bus structure used to transfer data between the I/O devices and memory.

(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) The performance of a cache memory is generally measured in terms of miss ratio.

(h) The average time required to reach storage location in memory and obtain its content is called access time.

(i) Interrupts are the methods of data transfer.

(j) DMA is an approach of performing data transfer between CPU and External device.

3. Choose the correct answers : 1×5=5

(a) The fastest access is provided using _____ as these memory location reside inside the processor.

(i) Caches (ii) RAM

(iii) Registers (iv) ROM

(b) _____ is used to store data in registers.

(i) D flip flop

(ii) JK flip flop

(iii) RS flip flop

(iv) None of the mentioned above

(c) Which of the following is a part of the Central Processing Unit ?

(i) Printer

(ii) Keyboard

(iii) Mouse

(iv) Arithmetic and Logic unit

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

(i) Immediate (ii) Direct

(iii) Definite (iv) Relative

(e) The method which offers higher speeds of I/O transfer is

(i) Interrupts

(ii) DMA

(iii) Memory mapping

(iv) Program controlled I/O.

PART – B

Marks – 45

4. (a) Write briefly about stored program concept. 3

(b) Represent the circuit and truth table of JK flipflop. 3

(c) Draw the logic circuit of the following : 3

(i) X +XY + XYZ

(ii) (AB+C) (C+D) (DC+A)

5. (a) Draw the logic diagram of half adder and full adder and explain with the help of truth table. 4

(b) What do you mean by signed number representation by computer system ? 3

(c) Find the 2's complement form of the number 1010 1011. 2

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

(b) Define addressing modes. What is direct and indirect addressing ? 3

(c) Write briefly about memory reference instructions. 2

7. (a) What do you mean by one byte instruction and zero byte instruction ? 3

(b) Write briefly about stack organization. 3

(c) Write briefly about microprogrammed control unit. 3

8. (a) Differentiate between ROM and PROM. 2

(b) What do you mean by Memory Hierarchy ? Explain briefly about cache memory. 4+3=7

9. (a) Differentiate between memory mapped I/O and Isolated I/O. 4

(b) Write brief notes on any two input devices. 5

10. Explain Booth's algorithm to multiply two numbers in 2's complement form. Use Booth's algorithm to multiply -15 decimal with -13 decimal. 9

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

12. Explain briefly the working principle of virtual memory and associative memory. 9