Roll No. .....

BCA–C-205

Bachelor of Computer Applications

(First Semester)

EXAMINATION, 2023-24

FUNDAMENTAL OF COMPUTER ORGANIZATION

Time : 2 $\frac{1}{2}$ Hours

Maximum Marks : 60

Note : All questions have to attempted.

Section—A

1. Multiple Choice Questions : 1 each

(a) The binary equivalent of the decimal number $(10)_{10}$ is : (CO2, BL-5)

(i) 10100

(ii) 010

(iii) 0010

(iv) 1010

(b) The register which contains the data to be written into or read out of the addressed location is called : (CO1, BL-3)

(i) Memory address register

(ii) Memory data register

(iii) Program counter

(iv) Index register

(c) 1's Complement can be easily obtained by using : (CO2, BL-1)

(i) Comparator

(ii) Adder

(iii) Inverter

(iv) Subtractor

(d) Perform binary addition : 101101 + 011011 = ? (CO2, BL-2)

(i) 011010

(ii) 1001000

(iii) 101110

(iv) 1010100

(e) The function of program counter (PC) holds : (CO1, BL-2)

(i) Temporary

(ii) Address for memory

(iii) Memory operand

(iv) Address for instruction

(f) Convert the $(127)_{10}$ decimal equivalent of the binary : (CO2, BL-5)

(i) 1100111

(ii) 1111111

(iii) 1111001

(iv) 1111000

(g) An instruction cycle consists of : (CO1, BL-2)

(i) fetching and decoding

(ii) decoding and executing

(iii) fetching, executing and storing

(iv) fetching, decoding, executing and storing

(h) RISC stands for : (CO5, BL-1)

(i) Reduce Instruction Set Computer

(ii) Risk Instruction Sequential Compilation

(iii) Risk instruction Source Compiler

(iv) None of the above

(i) Which of the following are the arithmetic logic gates ? (CO2, BL-3)

(i) X-OR

(ii) X-NOR

(iii) Both (i) and (ii)

(iv) None of the above

(j) The fastest data access is provided using ..... (CO3, BL-2)

(i) Caches

(ii) DRAM's

(iii) SRAM's

(iv) Registers

(k) ANSI stands for ..... . (CO5, BL-1)

(i) American National Standards Institute

(ii) American National Standards Interface

(iii) American Network Standard Interfacing

(iv) American Network Security Interrupt

(l) Which of the following operations is/are performed by the ALU ? (CO2, BL-2)

(i) Data Manipulation

(ii) Exponential

(iii) Square Root

(iv) All of the above

2. Attempt any *four* of the following : 3 each

(a) List down various types of registers available in computer system. (CO2, BL-2)

(b) Compare the concept of Decoder and Encoder.

(CO2, BL-4)

(c) Construct half subtractor using logic gates and truth table. (CO3, BL-3)

(d) What is memory hierarchy ? Explain with a diagram. (CO4, BL-4)

(e) Explain the difference between Synchronous and Asynchronous Serial Communication.

(CO5, BL-4)

Section—B

3. Attempt any *two* of the following : 6 each

(a) Differentiate between RISC and CISC.

(CO5, BL-4)

(b) Explain all types of logic gates with logic diagram and truth table. (CO1, BL-4)

(c) Solve : (CO1, BL-6)

(i) $(7BED)_{16} = (?)_8$

(ii) $(101101.101)_2 = (?)_{10}$

(iii) $(0.23)_{10} = (?)_{16}$

4. Attempt any *two* of the following : 6 each

(a) Explain the Control Unit with Block Diagram and difference between Hardwired and Micro programmed control Units. (CO4, BL-5)

(b) Design 4 × 1 Demultiplexer with its truth table, block diagram and logic diagram. (CO3, BL-6)

(c) Evaluate the Boolean function in SOP and POS form and draw a logic diagram. (CO3, BL-4)

$$F(A, B, C, D) = \sum m(0, 1, 2, 3, 7, 8, 10) + \sum d(5, 6, 11, 15)$$

5. Attempt any *two* of the following : 6 each

(a) Explain Instruction Cycle with flow chart, and micro operations. (CO4, BL-4)

(b) Discuss the strobe and handshaking method of data transfer. (CO5, BL-6)

(c) Evaluate the Boolean function is SOP and POS from and draw a logic diagram. (CO3, BL-4)

$$F(A, B, C, D) = \sum m(1, 3, 5, 7, 8, 9, 10, 11, 13, 15)$$