(6 pages) Reg. No. : .....

Code No. : 20318 E **Sub. Code : AMCS 42**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2022.

Fourth Semester

Computer Science — Core

COMPUTER ARCHITECTURE

(For those who joined in July 2020 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. ———— is concerned with the way the hardware components operate to form computer system.
   (a) Computer organization
   (b) Computer design
   (c) Computer architecture
   (d) Computer implementation

2. The ———— input in the register determines the action to be taken with each clock pulse.
   (a) buffer (b) register
   (c) load (d) zero

3. The register that keeps track of the instructions in the program stored in memory is ————
   (a) control register (b) program register
   (c) status register (d) direct register

4. The stack operation of insertion is called ————
   (a) push (b) pop
   (c) load (d) move

5. In addition algorithm, the signs of A and B are ————
   (a) identical (b) different
   (c) dissimilar (d) asymmetry

6. The addressing mode the operands are in registers that reside within CPU is ————
   (a) register mode
   (b) register indirect mode
   (c) implied mode
   (d) indexed addressing mode

7. ———— requires a sequence of add and shift micro operations.
   (a) Booth multiplication algorithm
   (b) Hardware multiplication algorithm
   (c) Array multiplier
   (d) Partial reminder

8. ———— is used to eliminate the speed mismatch between processor and IO devices.
   (a) IO interface (b) Priority
   (c) Daisy chain (d) Interrupt

9. The average time required to reach a storage location in memory and obtain its contents is called the
   (a) seek time (b) turnaround time
   (c) access time (d) transfer time

10. Which of the following is lowest in memory hierarchy?
    (a) Cache memory (b) Secondary memory
    (c) Registers (d) RAM

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Elaborate the basic computer registers and memory with diagram.

    Or

    (b) Describe the control unit of basic computer.

12. (a) Differentiate between push operation and POP operation in a stack.

    Or

    (b) Write down the register with common ALU.

13. (a) Point out the flowchart of the hardware multiply algorithm.

    Or

    (b) Explain the booth algorithm for multiplication of signed 2's complement numbers.

14. (a) Elaborate the I/O bus and interface modules.

    Or

    (b) Write a note on asynchronous serial transfer.

15. (a) Differentiate between the functions of RAM and ROM.

Or

(b) What are the types of auxiliary memory devices? Explain.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Draw and explain the direct and indirect address in instruction codes.

Or

(b) What are the phases of instruction cycle? Explain.

17. (a) Discuss the various operations of data transfer instructions.

Or

(b) Outline the typical program control instructions with example.

18. (a) Evaluate the hardware implementation of addition algorithm.

Or

(b) Determine the multiplication of floating point numbers with diagram.

19. (a) Illustrate the block diagram of a typical asynchronous communication interface.

Or

(b) Summarize the method of daisy-chaining priority.

20. (a) Outline the implementation of the address mapping using pages in virtual memory.

Or

(b) Explain in detail the different mappings used for cache memory.

———————