**D 130094**          (Pages : 2)          Name...........................................

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### FIFTH SEMESTER CBCSS–UG DEGREE EXAMINATION NOVEMBER 2025

(2019 Syllabus)

BCA

BCA   5B 07—COMPUTER ORGANISATION AND ARCHITECTURE

Time : Two Hours                                    Maximum : 60 Marks

### Section A - Short Answer Type Questions

*All questions can be answered*
*Each correct answer carries a maximum of 2 marks.*
*(Ceiling 20 Marks)*

1. How does an AND gate operate ?

2. What is the purpose of an XOR gate ?

3. Discuss the significance of NAND and NOR gates as universal gates.

4. What is the significance of an SR flip-flop in digital electronics ?

5. Describe the functionality of a master-slave JK flip-flop.

6. Explain the operation of an asynchronous counter.

7. Explain the role and function of computer registers.

8. Explain the concept of register reference instructions.

9. What is the purpose of a control memory in micro-programmed control ?

10. How are data transfer and manipulation operations typically implemented in processors ?

11. Discuss the role and function of cache memory in a computer system.

12. Compare and contrast asynchronous and synchronous modes of data transfer.

(Ceiling 20 marks)

### Section B - Paragraph/ Problem Type Questions

*All questions can be answered.*
*Each question carries 5 marks.*
*(Ceiling 30 Marks)*

13. Explain with example the difference between positive and negative logic in digital circuits.

14. Describe the operation of a BCD to 7-segment decoder with a truth table for the decoder.

**Turn over**

15. Explain the working of half adders and full adders with suitable diagrams.

16. Explain the working principles of SR and JK flip-flops with suitable diagrams and truth tables.

17. Describe the role of virtual memory in a computer system. How does it help manage memory more efficiently?

18. Discuss the steps involved in data transfer of DMA and its advantages over traditional data transfer methods.

19. Describe the working of a multiplexer with a neat diagram.

(Ceiling 30 marks)

## Section C - Essay Type Questions

*Answer any* **one** *of the following questions.*

*The question carries 10 marks.*

20. Design a synchronous 4-bit up/down counter using JK flip-flops.

21. Explain the concept of microprogrammed control and its implementation.

(1 × 10 = 10 marks)