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St. Claret College

Autonomous, Bengaluru

ROLL NO:

DATE:



MCA END SEMESTER EXAMINATION-APRIL 2026
MCA: FIRST SEMESTER
MCA 1225: COMPUTER ORGANIZATION AND ARCHITECTURE

TIME: 3 hours.

MAX. MARKS: 70

This paper contains TWO printed pages and FOUR parts.

Instructions:

1. Verify and ensure that the question paper is completely printed.
2. Any discrepancies or questions about the exam paper must be reported to the COE within 1 hour after the examination.
3. Students must check the course title and course code before answering the questions.

PART-A

Answer any EIGHT questions. Each answer carries TWO marks.

[2X8 = 16]

1. Perform addition $778 + 534$ in Binary Coded Decimal.
Perform subtraction $885 - 599$ in Binary Coded Decimal.
2. Implement Hamming code for binary data 10011001.
3. Convert $(2BF.2)_{16}$ to decimal.
Convert $(264.25)_{10}$ to its equivalent binary.
4. Describe Parity Bit with an example.
5. Define CPU Organization and its types.
6. Write short notes on control memory.
7. Describe Memory Mapped IO.
8. How are multiprocessor systems used to improve the performance of modern computer applications?
9. Define microprocessor interrupts and its types.
10. Write a short note on hierarchical memory system.

PART-B

Answer any FOUR questions. Each answer carries FIVE marks.

[5X4=20]

11. Illustrate Different types flip flops with graphic symbol and characteristic table.
12. Draw and explain instruction cycle.
13. Differentiate RISC and CISC.
14. Describe Register Transfer Language with examples.
15. Compare Programmed I/O and Interrupt Driven I/O with Advantages and Disadvantages.
16. Draw the pin diagram of 8086 microprocessor and illustrate the signals.

PART-C

Answer any TWO questions. Each answer TEN marks.

[10X2=20]

17. Explain in detail the 3X8 Line Decoder and 8X3 Line Encoder.
18. a) With a neat diagram, explain the organization and working of a common bus system.
b) Draw and explain interrupt cycle.
19. Explain DMA controller and DMA transfer with neat diagram.
20. Write short notes on the following
 - a) Multithreaded Architecture
 - b) Distributed MIMD Architecture

PART-D

Answer the following question. Answer carries FOURTEEN marks.

[14X1=14]

21. a) Convert the following function in sum of product and product of sum using K-Map
$$F(W, X, Y, Z) = \sum (0, 1, 2, 5, 8, 9, 10)$$
Design the logic diagram for SOP and POS.
b) Illustrate Subtraction using 2's complement for signed and unsigned number with example.
