Reg. No ..... Name **25INT315**

END SEMESTER EXAMINATION - OCTOBER 2025

SEMESTER 3 : INTEGRATED M.Sc. PROGRAMME COMPUTER SCIENCE - DATA SCIENCE

COURSE : **21UP3CRMCP10 : COMPUTER ORGANIZATION AND ARCHITECTURE**

(For Regular - 2024 Admission and Improvement/Supplementary 2023/2022/2021 Admissions)

Time : Three Hours Max. Weightage: 30

PART A

Answer any 8 questions

1. List any two registers used in a stack structure.
2. Name the principle by which a stack works.
3. The graphical method that provides a systematic method for simplifying and manipulating boolean expressions is called _____.
4. Calculate cache hit ratio if the no of cache hits is 56 and number of cache misses is 12.
5. The ---------- register points to the top of the stack.
6. If a node in a hypercube is labelled as 110, write the immediate neighboring nodes of 110.
7. Convert $(672)_8$ to hexadecimal number system.
8. If a RAM of 1024 × 8 has to be designed from RAM size of 128 words of 8 bits per word, then the number of chips required will be _____.
9. State the function of an I/O processor.
10. Define the term throughput.

(1 x 8 = 8 Weight)

PART B

Answer any 6 questions

11. Discuss the process of page replacement in virtual memory.
12. Discuss the similarities between a multiprocessor system and a multicomputer system.
13. Find the 2's complement of the following numbers: 01100101 and 11101010.
14. With a diagram, write short notes on the memory hierarchy.
15. Discuss how matrix multiplication is performed with vector processors.
16. Differentiate between Immediate and Absolute addressing modes, with an example.
17. Multiprocessing can improve performance by decomposing a program into parallel executable tasks. Discuss how this can be acheived.
18. Discuss the instruction format in a stack organization.

(2 x 6 = 12 Weight)

PART C

Answer any 2 questions

19. Discuss how the execution of programs take place inside CPU.
20. Simplify the function f(A,B,C,D) = Σ(0, 1, 2, 3, 5, 7, 11, 15) using k-map.
21. Discuss the various types of mapping procedures used in Cache memory.
22. Make short notes on RISC instructions. Write the RISC instructions for the following expression:
    X = (P / Q) x (Q -R)

(5 x 2 = 10 Weight)