QP CODE: 24803029

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Reg No : .....

Name : .....

INTEGRATED MSC DEGREE EXAMINATION, MAY 2024

Seventh Semester

INTEGRATED MSC COMPUTER SCIENCE-ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

CORE - ICSC7CR1 - COMPUTATIONAL MATHEMATICS

2020 Admission Onwards

2F67FB4D

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Define set with example.
2. Provide an example of an equivalence relation and explain why it meets the criteria.
3. Explain the concept of "conjunction" in propositional logic.
4. Construct a truth table for the statement: $p \wedge \neg q$
5. Write a short note on opertations of crisp set.
6. Define algebraic product of fuzzy set.
7. Define automaton.
8. List any three identities for regular expressions.
9. What is grammar?
10. Define Left linear grammar.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain the representation of relations using directed graphs. Provide an example and illustrate how directed graphs can depict different types of relations.

12. Define Inclusion-Exclusion Principle.

13. Convert the expression (p∨q)∧(r∨s)(p∨q)∧(r∨s) into both CNF and DNF.

14. Explain the Representation of crisp relation.

15. Explain finite automaton.

16. Discuss the steps involved in constructing a finite automaton equivalent to a regular expression.

17. Discuss the challenges associated with handling ε-moves in transition systems.

18. What are the notations used for grammar?

(6×2=12 weightage)

Part C (Essay Type Questions)

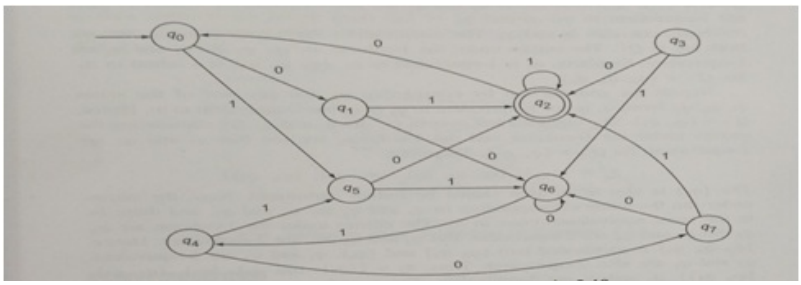
*Answer any **two** questions.*

*Weight **5** each.*

19. Define a) partial order relations on sets b) Check whether the relation (x, y) ∈ R, if, x ≥ y defined on the set of +ve integers is a partial order relation ?

20. Describe in detail fuzzy relation.

21. Construct a minimum state automaton equivalent to finite automaton described by



22. What is context free languages? Consider the CFG: S->XYX X->aX|bX|e Y-> bbb.Show that this generates the language defined by(a+b)*bbb(a+b)*

(2×5=10 weightage)