



QP CODE: 25050585



25050585

Reg No :

Name :

MSc DEGREE (CSS) EXAMINATION DECEMBER 2025

First Semester

Core Courses - CA500101 - COMPUTATIONAL MATHEMATICS

M Sc COMPUTER SCIENCE, MSc INFORMATION TECHNOLOGY

2019 Admission Onwards

E35B8AFC

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Define statement in mathematical logic with example.
2. Write a short note on precedence of operators.
3. Find Median of following discrete data series.
X : 10 20 30 40 50 60 70
f : 4 7 21 34 25 12 3
4. Find mean deviation from following set of values.
3100, 4200, 4000, 4500, 4600, 4700, and 5900
5. Discuss the term regression equations.
6. What are the different characteristics of an automated system?
7. How can you say that a transition system accepts a string or not?
8. Write the procedure to convert a finite automate with Λ -moves into a finite automate without Λ -moves.
9. What are the merits of fuzzy logic?
10. Define interval valued fuzzy sets.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Show that $(P \vee Q) \vee ((\neg P) \wedge (\neg Q))$ is a tautology.
12. Differentiate universal quantifiers and existential quantifiers.
13. Differentiate absolute and relative measures of dispersions.





14. Write a note on standard deviation with example.
15. Explain the significance of the study of correlation.
16. Construct a deterministic automaton equivalent to an automaton

$M = (\{q_0, q_1\}, \{0, 1\}, \delta, q_0, \{q_0\})$, where δ is given by its state table.

State/ Σ	0	1
$\rightarrow q_0$	q_0	q_1
q_1	q_1	q_0, q_1

17. Prove that the regular expression $(1 + 00^*1) + (1 + 00^*1)(0 + 10^*1)^*(0 + 10^*1) = 0^*1(0 + 10^*1)^*$.
18. What are the general characteristics of paradigm shift in fuzzy set?

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

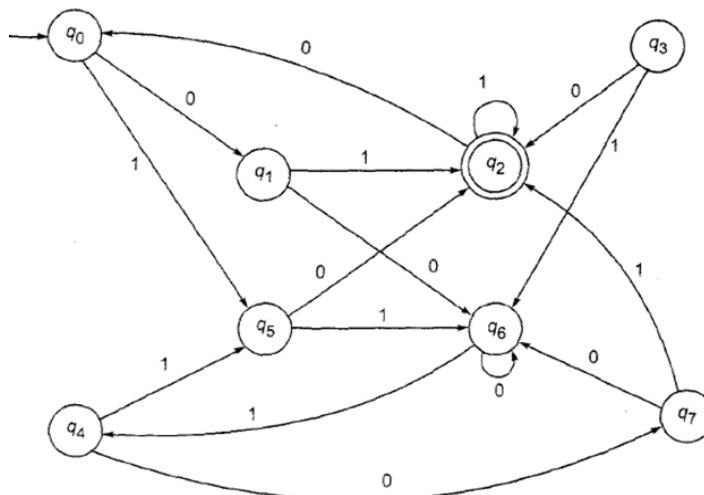
19. What is PCNF? Write the PCNF of $(\sim P \rightarrow R) \wedge ((Q \rightarrow P) \wedge (P \rightarrow Q))$.
20. Calculate mean from following data using step deviation method.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of Students	3	6	7	5	22	17	20	16	13	5

21. Calculate Karl Pearson's coefficient of correlation from the following data and interpret its value.

Students	1	2	3	4	5
Marks in Java	48	35	17	23	47
Marks in Python	45	20	40	25	45

22. Construct a minimum state automaton equivalent to the finite automaton described by the following transition diagram.





State/ Σ	a	b
$\rightarrow q_0$	q_1	q_0
q_1	q_0	q_2
q_2	q_3	q_1
q_3	q_3	q_0
q_4	q_3	q_5
q_5	q_6	q_4
q_6	q_5	q_6
q_7	q_6	q_3

(2×5=10 weightage)

