



K25P 3322

Reg. No. :

Name :

III Semester M.C.A. Degree (CBSS – Reg./Supple./Imp.)

Examination, November 2025

(2022 Admission Onwards)

MCA3C02 : THEORY OF COMPUTATION

Time : 3 Hours

Max. Marks : 60

PART – A

Answer **all** questions. **Each** question carries **two** marks.

1. Define tautology.
2. Describe different types of relations.
3. Differentiate between simple and compound events.
4. Define sample space.
5. Distinguish between deterministic automata and non-deterministic automata.
6. Define Grammar.
7. Define Parsing.
8. What are the closure properties for context-free languages ?
9. Explain Turing thesis.
10. Define linear bounded automata. (10×2=20)

PART – B

Answer **all** questions. **Each** question carries **eight** marks.

11. a) What are the converse, contrapositive and inverse of the statement.
“If it is raining, then the home team wins”.

OR

- b) State and prove DeMorgan's laws.

P.T.O.



12. a) Write a note on mutually exclusive and mutually exhaustive events.

OR

b) Explain dependent and independent events with examples.

13. a) Give a simple description of the language generated by the grammar with productions :

$S \rightarrow aA$

$A \rightarrow bS$

$S \rightarrow \lambda$

OR

b) Construct a NFA that accepts all strings with $\{0, 1\}$.

14. a) With a note on Greibach normal form.

OR

b) Explain deterministic pushdown automata and deterministic context-free languages.

15. a) Explain standard Turing machine using a diagram.

OR

b) Explain post correspondence problem of Turing machines.

(5×8=40)