

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024
(Regular/Improvement/Supplementary)
COMPUTER SCIENCE AND MATHEMATICS (DOUBLE MAIN)
GDCS3B05T: THEORY OF COMPUTATION

Time: 2 Hours

Maximum Marks: 60

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 20 marks)

1. What are the applications of TM?
2. Define Non-terminal with example.
3. What is regular set?
4. Do Turing machine accept all the languages accepted by a PDA?
5. What do you mean by expressive power of an automata?
6. Is every context free languages regular? Justify your answer.
7. Elaborate on ϵ -NFA.
8. What do you mean by parsing?
9. Define Chomsky Normal Form.
10. Define regular grammar.
11. Give the production rule of Type 2 languages.
12. What is left most derivation?

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 30 marks)

13. Write a short note on formal language in detail.
14. Explain Type 3 grammar with example.
15. Differentiate between leftmost and rightmost derivations.
16. Explain different types of parsers with example.
17. Describe the concept of Turing Machine as language accepters.
18. Give an account on the acceptance concept of PDA.
19. Explain in detail the closure properties of Regular languages.

SECTION C: Answer any *one* question. The question carries *ten* marks.

20. Define Finite Automata. Explain different types of automata with examples.
21. What is ϵ -production? Explain the steps to eliminate ϵ - productions. Remove the ϵ - production from the following CFG:

$S \rightarrow XYZ$
 $X \rightarrow 0X \mid \epsilon$
 $Y \rightarrow 1Y \mid \epsilon$

(1 × 10 = 10 Marks)