D3BCA1803 (S3) (PAGES 2) Reg. No..............................

Name: ....

THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2022

(Supplementary 2018 Admission)

BCA

CBCA3C06T: THEORY OF COMPUTATION

Time: 3 Hours **Maximum Marks: 80**

SECTION A: Answer *All* the questions. Each carries 1 mark.

1. Give any two subset of the set A={a,b,c}

2. What is a connected graph ?

3. Push down automata accepts .... language.

4. Define grammar.

5. What do you mean by regular set ?

6. Give the regular expression that generates strings with substring "**aba**".[Σ={a,b}]

7. Define Context free language.

8. What do you mean by finite language ?

9. Do PDA accept regular language ?

10. Turing machine accepts ....language.

(10 x 1 = 10 Marks)

SECTION B: Answer *All* the questions. Each carries 2 marks.

11. Draw a Venn diagram to represent AU(B∩C).

12. Define a reflexive relation with the help of an example.

13. What is recursive set ?

14. Define NDFA.

15. What are the different components in PDA ?

16. Write a short note on Positive closure.

17. What are the different ways of representing Turing machine ?

18. What do you mean by unit production ?

(8 x 2 = 16 Marks)

SECTION C: Answer any *Six* questions. Each carries 4 marks.

19. What are different types of functions ?

20. Let us assume that F is a relation on the set R real numbers defined by xFy if and only if x-y is an integer. Prove that F is an equivalence relation on R.

(PTO)

21. What do you mean by dead state ? Give an example.

22. Differentiate DPDA and NPDA.

23. What do you mean by ambiguity in CFG ? Give an example for ambiguous grammar.

24. Construct a grammar that generates following language.

$$L=\{aab, aba, bab\}$$

25. Explain about different ways of accepting a string in PDA.

26. What are the properties of transition functions ?

27. Explain the construction of Turing Machine.

(6 x 4 = 24 Marks)

SECTION D: Answer any *Three* questions. Each carries 10 marks.

28. Explain in detail about Chomsky classification of languages.

29. Construct a minimal DFA for the following conditions. $\Sigma=\{a, b\}$

    a. DFA should accept every string starts with ab

    b. DFA should accept every string ends with ba

30. Explain in detail about Mealy and Moore Models.

31. Construct a PDA for the language $L=\{a^n b^n \mid n>0\}$

32. Explain in detail about CNF and GNF.

(3 x 10 = 30 Marks)