C

Question Paper Code: 95504

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Fifth Semester

Computer Science Engineering

19UCS504 – THEORY OF COMPUTATION

(Regulation 2019)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The smallest finite automata which accepts the language {x | x is a word   CO2- App
   over ∑={a,b} and length of x is divisible by 5} has _____ states.

   (a) 4   (b) 5   (c) 6   (d) 7

2. Two automata's are equal when it satisfies the following conditions.   CO1- U

   (a) their accepting and non accepting states are equal

   (b) initial and final states are equal

   (c) they accept at least one same string

   (d) all the above

3. The Given grammar G: CO2- App
   (1) S->AS   (2) S->AAS (3) A->SA   (4) A->aa
   Which of the following productions denies the format of Chomsky Normal
   Form?

   (a) 2,4   (b) 1,3   (c) 1, 2, 3, 4   (d) 2, 3, 4

4. The language accepted by a Linear Bounded Automata: CO1- U

   (a) Type0   (b) Type1   (c) Type2   (d) Type3

5. TM is superior than PDA because it accepts   CO1- U

   (a) RL   (b) CFL   (c) RL and CFL   (d) RL,CFL Recursive and RE language

6. List out the differences between DFA , NFA and ∈ NFA.   CO1- U

7. What is meant by equivalent states in DFA?   CO1- U

8. What is the relationship between Inference, Derivation and Parse Tree   CO1- U

9. Define Pumping lemma for CFL.   CO1- U

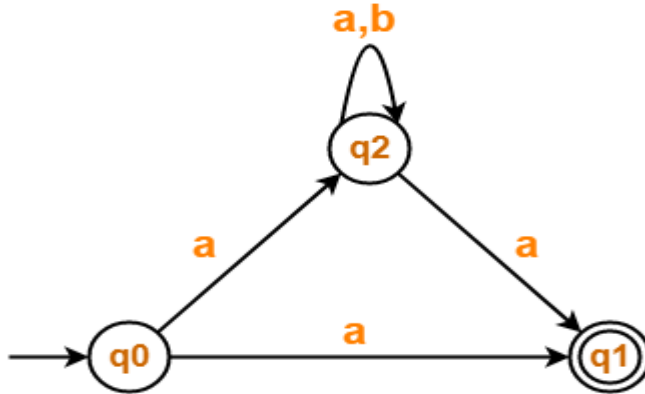10. Define Post Correspondence Problem.   CO1- U

PART – C (5 x 16= 80Marks)

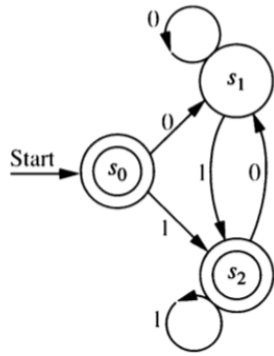11. (a) Convert the given NFA to DFA.   CO2-App   (16)
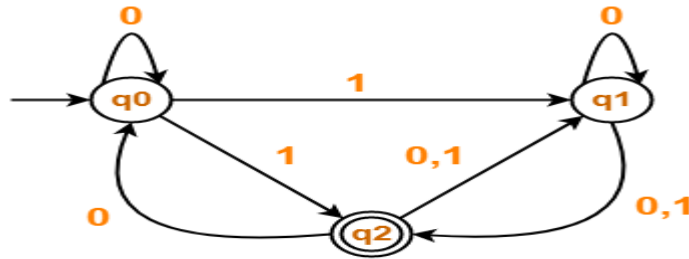
Or

(b) Convert the given NFA to DFA.   CO2- App   (16)

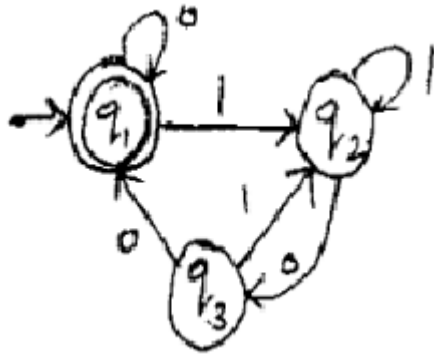12. (a) Convert the Regular Expression $(01+001)*00$ into ε-NFA.   CO2-App   (16)

Or

(b) Construct a regular grammar that generates the language accepted   CO2- App   (16)
by this finite state automaton.

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13. (a) Construct Regular Expression for the following DFA. CO2-App (16)

Or

(b) Find the minimized DFA for the following regular expression (a/b)* CO2- App (16)
abb.

14. (a) Construct a PDA for the given grammar and check the validation of CO2- App (16)
abcba and aba.
S -> aSa | bSb | c.

Or

(b) Construct a PDA accepting by empty stack for the language $\{a^n b^{2n}$ CO2- App (16)
$| n \geq 1)\}$.

15. (a) Design a Turing Machine for L=$\{ 0^n 1^n | n >= 1\}$ CO2- App (16)

Or

(b) Construct a TM to perform reverse operation. CO2- App (16)

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