DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2019

Course: B. Tech in Computer Sci. & Engineering **Sem: V**

Subject Name: Theory of Computation **Subject Code: BTCOC502**

Max Marks:20 **Date:- 24th Sept 2019** **Duration:- 1 Hr.**

Instructions to the Students:

1. Figures to the right indicate marks.
2. Assume suitable data.

Q. 1 Select the correct option. 6*1=6 M

1. _____ is a set of strings.

a. Language b. grammar c. NFA d. DFA

2. . Let r and s are regular expressions denoting the languages R and S. Then (r s) denotes _____

a. RS b. R* c. RUS d. R+

3. In transition diagrams a state pointed by an arrow represents the _____ state.

a. final b. interior c. start d. final or start

4. _____ grammar is also known as Type 3 grammar.

a. unrestricted b. context free c. context sensitive d. regular grammar

5. Grammar that produce more than one Parse tree for same sentence is:

a. Ambiguous b. Unambiguous c. Complementation d. Intersection

6. $S \rightarrow Sab$ $S \rightarrow a$ is which grammar ?

a. Right Linear Grammar b. Left Linear Grammar c. Linear Grammar d. None of the above

Q.2 Solve Any Two of the following. *3 = 6

(A) Construct the DFA ($\sum = 0, 1$)

i) w= Strings starting and ending with same characters

ii) w= string with "101" as substring

(B) Consider following Grammar:

S→ A1B

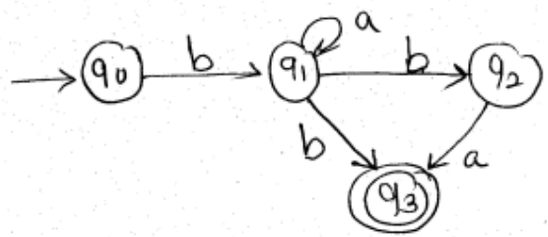
A→ OA | epsilon

B→ 1B | 0B | epsilon

Give the leftmost derivation for the inputs:

1) 00101 2)1001

(C) Construct the regular Grammar for the given finite Automata:



Q. 3 Solve Any One of the following. 1*8=8 Ma

(A) What is pumping lemma technique?
Using pumping lemma show that L= $\{a^n b^n \mid n>=1\}$ is not regular language.

(B) Convert Following NFA to DFA

1)

state	0	1
→ a	{a,b}	{a}
b	{c}	{c}
c	{d}	–
* d	{d}	{d}

2)

state	0	1
→ p	{q,r}	[q}
*q	{r}	{q,r}
r	{s}	{p}
*s	–	{p]

*** End ***