Correction in Theoretical Computer Science

Q.P. Code: 10083672

Consider Following corrections in QP Code 83672 (TE Comp SEM VI TCS subject)

Q2 b. Please read 'i' instead of 'l' in the production rule set provided.

Correct production rules are:

S --> iCtS | iCtSeS | a, C --> b

Rest of the question is as it is.

Q3 b.

ii. Read Regular expression as 01((01)*+111*+0)*1

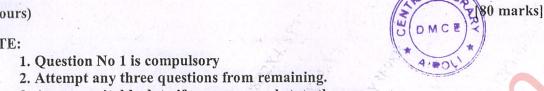
Paper / Subject Code: 31921 / Theoretical Computer Science

TE (comp.) Sem (I) R-19 03/06/25 c-scheme

(3 hours)

NOTE:

3. Assume suitable data if necessary and state the same.



01.

- a) Difference between NFA & DFA
- b) Design a Moore machine for binary adder. Clearly list all components that make up the machine.
- c) Construct the right linear grammar corresponding to regular expression $R = (0+1)1^*(1+(01)^*)$
- d) Explain Pumping Lemma for CFG.

O2.

a) Construct PDA accepting the language $L = \{a^{2n}b^n | n \ge 0\}$ [10] [10]

b) Consider the following grammar: $S \rightarrow ICtS \mid ICtSeS \mid a, C \rightarrow b$ For the string 'ibtibtaea' find the following:

- Is this a CFG? Explain your answer. (i
- Leftmost derivation ii)
- iii) Rightmost derivation
- iv) Parse tree for both of above
- Check if the above grammar is ambiguous.

Q3.

a) Construct a DFA accepting a language generated by the left linear grammar given below [10]

 $S \rightarrow Ca \mid Bb, C \rightarrow Bb, B \rightarrow Ba \mid b$ b) Construct the finite automata equivalent to the following regular sets

- i) 10+ (0+11)0*1
- ii) $01[(10)^*+111)^*+0]^*1$

[10]

[20]

Q4.

- [10]a) Design a TM to add two unary numbers
- [10] b) Design a finite automata with output to check divisibility by 3 to binary number.

05.

- a) Write a short note on Pumping Lemma for regular language. Prove $L = \{a^{2n}b^{3n} \mid n>0\}$ is not a regular language using pumping lemma. [10]
- [10] b) Construct PDA accepting the language $L = \{a^{2n}b^n \mid n>0\}$

Q6.

- [10] a) Explain Chomsky hierarchy.
- [10] b) Write a detail note on halting problem

D.P. Code:-

83672

Page 1 of 1

Program Code: 1700235