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Roll No

CS-227-CBCS

B.E. IV Semester

Examination, June 2020

Choice Based Credit System (CBCS)

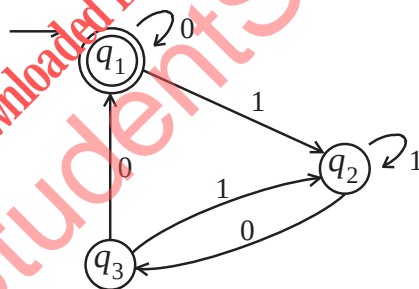
Theory of Computation

Time : Three Hours

Maximum Marks : 60

- Note:** i) Attempt any five questions.
ii) All questions carry equal marks.

- What is Mealy Machine? How Finite Automates can be converted into Moore Machine? Explain with the help of example.
 - Design a $(\text{Mod}4)_2$ machine over the alphabet $(0,1)$?
- Find out the Regular Expression from given DFA



- Write the CFG for the following language
 - $L = \{0^i 1^j 2^k, i = j \text{ or } j = k\}$
 - $L = \{0^n 1^n, n \geq 1\}$
 - $L = \{\text{even palindrome over } (0, 1)\}$

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PTO

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4. a) Show that the grammar
 $S \rightarrow a / abSb / aAb$
 $A \rightarrow bS / aAAb$ is ambiguous
- b) Explain Chomsky Normal Form. Explain with example.
5. Construct the PDA for the following example?
 - i) $a^n b^n \quad n \geq 1$
 - ii) $a^m b^n c^{m+n} \quad |m, n \geq 1|$
 - iii) $\omega \omega^R \quad \omega \in \{0,1\}$
6. a) Design a Turing Machine for the language
 $\{L(G) = a^n b^n \quad n \geq 1\}$
- b) Describe various types of Turing Machine.
7. a) How P class problem different from NP class problem?
- b) What do you mean by Vertex cover problem and Hamiltonian path problem?
8. Write a short notes (any three):
 - i) NP Hard
 - ii) Decidable problem
 - iii) Pumping Lemma for Regular
 - iv) Myhill - Nerode

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