Roll No. 2292300301

Total No. of Questions : 16] [Total No. of Printed Pages : 4

EXS-215

B.Tech. IVth Semester (New Scheme) CSE

Examination, 2023

Theory of Computation

Paper - CS-404

Time : 3 Hours] **[Maximum Marks : 60**

Note :- Attempt all questions : -

Section - A **1×10=10**

Short Answer Type Questions (Any 10)

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1. Define the term Epsilon transition ?
2. State pumping lemma for regular languages ?
3. Explain the tuples of PDA ?
4. Explain various types of CNF with example ?
5. What do you understand by turing machine ?
6. How DPDA is different from NPDA ?
7. What are various types of grammar in Chomsky hierarchy ?
8. Write difference between NFA and NFA with epsilon.
9. Define the term Epsilon transition ?
10. Design DFA to accept strings over $\sum=(a,b)$ with two consecutive a's.
11. Construct an NFA for the following regular expression : (ab + b)*a+b?

Section - B

Long Answer Type Questionss **5×10=50**

1. What are the various types of graph, explain its types also ?

OR

Discuss various properties of regular grammar ?

Prove that the following languages are regular or not

(1) $\{02n \mid n >= 1\}$

(2) {amb na m+n | m > = 1 and n > = 1} ?

2. Construct a NFA with epison to accept strings of 0's and 1's having substring 001001.

OR

Explain various properties of regular expression ?

3. Define ambiguous grammar, How can we say that a grammar is ambiguous or not, discuss with suitable example.

OR

Explain various application of PDA with its types ?

4. (a) How can we say that turing machine accept grammar is better than other machine ? comment.

(b) Discuss properties of unrestricted grammar ?

OR

(a) Design a TM that accepts the language of odd integers written in binary.

(b) Find the type of language L= {anbncn | n>=1} ? justify.

5. (a) Explain Chomsky hierarchy with grammar and language types ?

(b) Define parse tree with an example.

OR

(a) What is petri nets ? Discuss with example.

(b) What are the various NP and P problem ? Explain with suitable example.

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