BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZ

ROLL NO : | | | | | | | | | | | | Total number of pages:|0

Total number of questions:06

B.Tech. -CSE/ 5th Sem

Theory of Computation (RP)

Subject Code: BTCS-504A

Paper ID : M|18

(2015 batch onwards)

Time allowed: 3 Hrs Max Marks:60

Important Instructions:

- All questions are compulsory

PART A (10 x 2 marks)

Q. 1. Answer in brief:

(a) Define non-deterministic finite automata.
(b) Define regular expression.
(c) Differentiate Moore v/s Mealy machine.
(d) What is the need of pushdown automata?
(e) State Pumping Lemma.
(f) Briefly explain concept of Unit production with a suitable example.
(g) Define PCP.
(h) What is universal Turing machine?
(i) Give instantaneous description of Turing machine.
(j) Explain different steps involved in elimination of null moves.

PART B (5 × 8 marks)

Q2. Describe DFA and NDFA. Also give differences among them.

OR

Explain the procedure for converting a Mealy machine into a Moore machine with a suitable example. CO1

Q3. Construct a finite automata equivalent to the regular expression

$(0 + 1)^* (00 + 11) (0 + 1)^*$

OR

Construct a regular grammar G generating the regular set represented by

$a^*b(a + b)^*$ CO2

Q4. Explain the concept of ambiguity with a suitable example.

OR

Construct a grammar G generating $\{a^n b^n c^n | n \geq 1\}$. CO3

Q5. What are the steps needed to reduce a context free grammar to an equivalent grammar in Chomsky Normal form?

OR

Find a grammar in Greibach normal form equivalent to S→AA|a, A→SS|b. CO3

Q6. Describe any two representation of Turing machine.

OR

Design a Pushdown Automata that accepts the language $\{0^n 1^{2n} | n>0\}$ CO4