T.Y.B.SC. (Computer Science) SEM –V (2014 COURSE) : WINTER - 2018

SUBJECT: THEORETICAL COMPUTER SCIENCE

Day : Saturday
Date : 20/10/2018

W-2018-0970

Time: 12.00 NOON TO 02.00 PM
Max. Marks: 40

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.

Q.1 Answer **ANY TWO** of the following: **(10)**

a) Define FA. Also explain DFA and NFA.

b) Define regular expression. Find regular expression for a language having double 'a' & double 'b' in it over {a,b}

c) Elaborate Greibach Normal form with the help of suitable example.

Q.2 Answer **ANY TWO** of the following: **(10)**

a) Construct FA for the regular expression (0+1)* + 01

b) Differentiate between PDA and TM.

c) Construct PDA for the language with well formedness parenthesis over {(,)}

Q.3 Answer **ANY TWO** of the following: **(10)**

a) Prove that regular sets are closed under complementation.

b) Show that $L = \{a^p \mid p \text{ is prime number}\}$ is non-regular set.

c) Write a note on TM model, also state the ID of TM.

Q.4 Answer **ANY FIVE** of the following: **(10)**

a) Give formal definition of Moore Machine.

b) Define Ambiguous grammar.

c) State the equivalence theorem of NFA & DFA.

d) Define Myhill-Nerode theorem.

e) If $L_1 = (a+b)^*$ and $L_2 = (ab)^*$ Find $L_1 \cap L_2$

f) Find prefixes and suffixes of the string "Computer".

g) Construct FA for (a+b)* over {a,b}

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