BARANI INSTITUTE OF MANAGEMENT SCIENCES

Final-Term Exam   **Fall Semester 2020**

Course Title : Theory of Automata	**Course Code : CS-536**
Discipline /Program : BSCS-6	**Total Marks : 30**
Time allowed : 24 Hours	**Instructor's Name: Saira Sultana**

Q.No.1   Answer the following short questions   (7)

   i.   For the language $L= a^n b^n c^n d^m$ where n and m >=1, which sort of machine is need to accept the language.   **(2)**

  ii.   Define a language L, in a recursive way where the strings containing fifth latter must followed by aa and last latter should be followed by bb defined over alphabet {a,b}. also mention minimum length of string from above language .   **(3+2)**

Answer the following long questions

Q.No.2   Design a DFA graph and its transition table for the RE (a+b)a(aa)*(a+b)*bb.   **(5)**

Q.No.3   You are required to build a Turing machine for the given language is $L= \{ w^n x^n y^n z^n \}$ where n>=1. Also write at least four invalid strings for the machine and drive a valid string of length 12 over the tape to evaluate that either the designed machine accept the given string or not. **(7)**

Q.No.4   Construct a PDA that accepts the language=$\{x^{3a} y^a z^b$ /a,b>=1 where $\sum=\{x,y,z\}$ **(5+2)**

   Note: Also derive any Two valid strings accepted by the followed PDA

Q.No.5   Write a CFG to generate string that belongs the language $x^a y^b z^c$: a=b or b ≠ c where $\sum=\{x,y,z\}$ **(2+2)**

   Note: Also derive any four valid strings accepted by the produced CFG