DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER VI [C.E / I.T]
SUBJECT: (CT-506) THEORY OF AUTOMATA & FORMAL LANGUAGES

Examination	**: Block**	**Seat No.**	**: _____**
Date	**:**	**Day**	**:**
Time	**:**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

(a) Is a Non Deterministic TM more powerful than Deterministic TM? Justify **[2]**
(b) Define : Acceptance by TM **[2]**
(c) Define : Deterministic PDA **[2]**
(d) Give recursive definition for the set of positive integers divisible by 2 or 7 **[2]**
(e) Define distinguishable string with respect to Language L. **[2]**
(f) Define Pumping Lemma for regular language **[2]**

Q.2 Attempt ***Any Two*** from the following questions. **[12]**

(a) Construct DFA for the following (0+1)* (01+110) **[6]**
(b) Using proof by minimal counter example prove that: **[6]**
For every integer n>= 0, $5^n - 2^n$ is divisible by 3.

Q.3 (a) Design Turing M to Compute f(x) = x mod 2 **[6]**
(b) Construct NPDA for language { ww^r| w belongs to {a,b}*} **[6]**