**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examinations – June 2016**

**Subject Title: THEORY OF COMPUTATION Time : 3 hours**

**Subject Code: 14CS2047 Maximum Marks: 100**

1. a. Construct the NFA for (0+1)\* 00(0+1)\*. Convert the constructed NFA to equivalent DFA. (10)

b. With suitable example differentiate DFA from NFA and write their applications. (10)

**(OR)**

2. a. Construct DFA for the string over ∑ = {a,b} for (a+b)\*baab. (10)

b. What is the relationship between regular expression and regular language? (10)

3. a. Determine whether the string w = aabbb is in the language generated by the grammar: S -> AB

A -> BB | a

B -> AB |b

Write all the steps associated. (12)

b. Remove all unit-productions, all useless productions, and all λ-productions from the grammar

S -> aA | aBB

A -> aaA | λ

B -> bB | bbC

C -> B (8)

**(OR)**

4. a. Construct a pda that accepts the language generated by the grammar with productions

S -> aSbb | a (12)

b. Is the language L = {an bn : n≥ 1} U {a} deterministic? Justify. (8)

5. For the grammar: E - > E + E | E \* E | ( E ) | - E | id, construct the leftmost and rightmost derivation tree. Check if the string id + id + id is accepted or not.

**(OR)**

6. Write in detail about push down automata.

7. With necessary diagrams, write about the standard turing machine.

**(OR)**

8. How turing machine is used to perform complicated tasks?

**Compulsory:**

9. In detail explain Chomsky Hierarchy.