Code No: R22123          **R10**          SET - 1

**II B. Tech II Semester Supplementary Examinations, April/May-2017**
**AUTOMATA THEORY AND COMPILER DESIGN**
(Information Technology)

Time: 3 hours                                                          Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1.  a) Obtain the Regular Expression represented by the following Regular Set: {0, 1, 00, 01, 000, 001, 0000, 0001, ...}.
    b) Design a DFA that accepts the language over = {a, b} of all strings that contain the sub-string either aa or bb.                                                          (7M+8M)

2.  a) If G is a grammar S $\rightarrow$ SbS / a, Show that G is ambiguous.
    b) Design CFG for the language {$0^n1^n$| n >= 1}                                    (8M+7M)

3.  a) Show that the following grammar is not an LR(0).
       S$\rightarrow$0A2
       A$\rightarrow$ 1A1
       A$\rightarrow$1
    b) Explain error recovery in YACC.                                                  (8M+7M)

4.  a) Compare and contrast the quadruples, triples & indirect triples.
    b) Write the translation schemes for addressing array elements for following grammar:
       S $\rightarrow$ L := E
       E $\rightarrow$ E + E/(E)/L
       L $\rightarrow$ Elist]/id
       Elist $\rightarrow$ Elist, E
       Elist $\rightarrow$ id [ E                                                        (7M+8M)

5.  a) What is Type System? Discuss static and dynamic Checking of types?
    b) What role does semantic analysis play in compiler design? Give example of a semantic error that cannot be detected at compile stage.                                         (7M+8M)

6.  a) Describe lexical scoping with nested procedures and without nested procedures.
    b) Discuss about the stack allocation strategy of runtime environment with an example
                                                                                       (7M+8M)

7.  a) What is peephole? What peephole optimizations can be performed on code
    b) Describe the detection of loop invariant computation.                            (8M+7M)

8.   Explain about the generic code generation algorithm with an example.               (15M)