[No. of Printed Pages – 2]

CSE204 Enrol. No. .....

[ET]

END SEMESTER EXAMINATION : APR.-MAY, 2017

THEORY OF COMPUTATION

Time : 3 Hrs. *Maximum Marks : 70*

Note: ***Attempt questions from all sections as directed.***

SECTION – A (30 Marks)

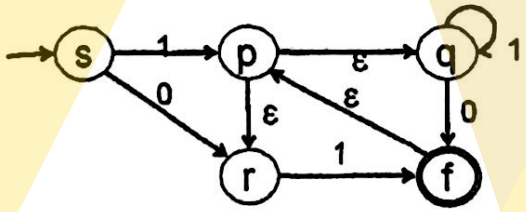
Attempt any **five** *questions out of* **six.**
Each question carries **06** *marks.*

1. Explain Chomsky Hierarchy of grammars and give the production rules in each category.

2. Prove that f(x,y)=x+y is primitive recursive function.

3. What are undecidable problems ? Discuss the undecidability of halting problem of Turing machine.

4. What is NFA ? Convert the following NFA into DFA by subset construction :



5. What is Universal Turing machine ? Give example.

6. Design the finite automata accepting all the decimal numbers divisible by 4.

P.T.O.

aminotes

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**
Each question carries **10** *marks.*

7. Design Turing machine for the language,

   $L = \{a^n b^n c^n; n>=1\}$

8. (a) Write the regular expression for the language containing all the strings of a and b that ends either with aa or with bb. Convert the result into equivalent DFA. (5)

   (b) Describe the working of Linear Bound Automata with the help of example. (5)

9. What are normal forms. Convert the following language into Griebach Normal Form :

   $L = \{a^m b^m c^m d^n; m,n>=01$

SECTION – C (20 Marks)

(Compulsory)

10. (a) Explain the difference between Deterministic and Non deterministic Push down automata with example. Design the Push down automata for the following grammar : $L = \{a^m b^n c^n; n>=01\}$ (14)

    (b) Check whether the the PCP with two lists X and Y have solution, where $X=\{b, bab^3, ba\}$ and $Y = \{b^3, ba, b\}$. (6)

(1000)