D 13236 **(Pages : 2)** **Name**

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2016

(CUCSS)

Computer Science

CSS 1C 03—THEORY OF COMPUTATION

(2014 Admissions)

Time : Three Hours Maximum : 36 Weightage

Part A

Answer **all** *questions.*
Each question carries 1 ***weightage.***

1. What is Deterministic Finite Automata ?
2. What are Epsilon transitions ?
3. Give an example of regular expression.
4. What is pumping lemma ?
5. What are normal forms ?
6. What are context free languages ?
7. What are Turing machines ?
8. What is Cook's theorem ?
9. What do you know about Computability ?
10. What do you know about Decidability ?
11. Write any *two* properties of regular language.
12. For what purpose CYK algorithm is used ?

(12 x = 12 weightage)

Part B

Answer any **six** *questions.*
Each question carries 2 ***weightage.***

13. Describe about non-deterministic finite automata.
14. Describe about finite automata with epsilon transitions.
15. Prove the existence of non regular languages.

Turn over

16. Write note on regular grammar.

17. Describe about the closure properties of CFL's.

18. Describe about DCFL.

19. Describe about multitape Turing machine.

20. Describe about the closure properties of recursive enumerable language.

21. Describe about NP completeness.

(6 x 2 = 12 weightage)

Part C

Answer any **three** *questions.*
Each question carries 4 *weightage.*

22. Show the equivalence of deterministic and non deterministic finite automata with an example.

23. Describe about DFA state minimization.

24. Show the equivalence of LBA and context sensitive grammar (CSG) with an example.

25. Prove the existence of non context-free languages.

26. Show the equivalence of type 0 grammar with TMs.

27. Explain about time and space bounded simulations.

(3 x 4 = 12 weightage)