**Reg. No. :** 

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## Question Paper Code: 99813

B.E./B.Tech. DEGREE EXAMINATION, NOV 2022

Elective

Information technology

19UIT913- SYSTEM SOFTWARE INTERNALS

(Regulations 2019)

Duration: Three hours                                                        Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. 'System Software is machine dependent'. Justify the statement.                    CO3- Ana

2. What will happen if a SIC program is loaded in a location different from the    CO3- Ana
   starting address specified in the program? Will the program work properly?
   Justify your answer.

3. Define a binary object program format for SIC and write an absolute loader    CO1- U
   to load programs in this format

4. What is the purpose of relocation bit in object code of relocation loader?        CO1- U

5. Discuss Regular expression and the Algebraic properties of Regular    CO1- U
   Expression.

6. Express the main idea of NFA? And discuss with examples (a/b)*                CO1- U

7. Write an algorithm for finding FOLLOW.                                        CO1- U

8. Differentiate Top Down parsing and Bottom Up parsing?                        CO2- App

9. List out the two rules for type checking.                                        CO3- U

10. Illustrate the concepts of copy propagation.                                    CO3- U

PART – B  (5 x 16= 80Marks)

11. (a)  Explain the architecture of SIC machine with suitable examples        CO1-U        (16)

                                        Or

    (b)  Design an algorithm for performing the pass 1 operations of a two    CO1-U        (16)
         pass assembler.

12. (a) Explain in detail about Basic Loader Functions      CO2-U    (16)

<div align="center">Or</div>

    (b) Explain how program linking is to resolve the problems with   CO2-U    (16)
external references (EXTREF) and external definitions (EXTDEF)
from different control sections

13. (a) Construct a minimized DFA for the RE (a+b)(a+b)* and trace for   CO2-App   (16)
the string baaaab.

<div align="center">Or</div>

    (b) Create DFA the following NFA.       CO2-App   (16)
M=({q0,q1},{0,1},δ,q0,{q1})
Where δ(q0,0)={q0,q1}
δ (q0,1)={q1}
δ(q1,0)=ϕ
δ(q1,1)={q0,q1}

14. (a) Solve the following grammar to generate the SLR parsing table.   CO2-App   (16)
E→E+T | T
T→T*F | F
F→F*| a| b

<div align="center">Or</div>

    (b) Evaluate predictive parsing table for the following grammar and   CO2-App   (16)
Parse the string id+id*id
E→E+T | T
T→T*F | F
F→(E) | id

15. (a) Create following assignment statement into three address code   CO2-App   (16)
D:=(a-b)*(a-c)+(a-c) and apply code generation algorithm to
generate a code sequence for the three address statement.

<div align="center">Or</div>

    (b) Generate code for the following sequence assuming that n is in a   CO2-App   (16)
memory location
s=0
i=0
L1 : if I > n goto L2
s=s+i
i=i+1
goto L1
L2 :

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