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Question Paper Code: 96201

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Sixth Semester

Computer science and Engineering

19UCS601- PRINCIPLES OF COMPILER DESIGN

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

- _____ is considered as a sequence of characters in a token. CO1- U
(a) Texeme (b) Pattern (c) Lexeme (d) Mexeme
- Which of the following is a top down parser? CO1- U
(a) recursive descent parser (b) shift reduce parser
(c) operator precedence parser (d) SLR parser
- Intermediate code is ----- CO1- U
(a) independent of source language (b) independent of target machine
(c) dependent of source language (d) dependent of target machine
- In activation record, Which of the following Stores the address of CO1- U
activation record of the caller procedure?
(a) Access Link (b) Actual Parameters (c) Control Link (d) Temporaries
- The graph that shows basic blocks and their successor relationship is CO1- U
called _____
(a) DAG (b) Flow graph (c) control graph (d) Hamiltonion graph

PART – B (5 x 3= 15Marks)

- Illustrate the language processing system. CO1- U
- Draw the syntax tree of the statement $a=a+b*(e/f)$ Draw the syntax tree of CO2- App
the statement $a=a+b*(e/f)$

8. Draw the quadruple structure for the following statement $x = -a*b + -a*b$. CO2- App
9. What are the fields of activation record?. CO4- U
10. What is common sub expression? CO5- U

PART – C (5 x 16= 80Marks)

11. (a) Write the regular expression for the pattern starting and ending with any number of digits with at least two letters in it over $\Sigma = \{\text{letter, digit}\}$. Derive the DFA for the given pattern. CO2-App (16)
- Or
- (b) Derive DFA for the regular expression $(a+b)^* abb (a+b)^*$ CO2-App (16)
12. (a) Design a predictive parser for the following grammar and also parse the string (a) CO2- App (16)
- $S \rightarrow a \mid \uparrow \mid (T)$
 $T \rightarrow T, S \mid S$
- Or
- (b) Construct SLR parser for the following grammar and parse the string cdc. CO2- App (16)
- $S \rightarrow CC$
 $C \rightarrow cC$
 $C \rightarrow d$
13. (a) Explain in detail the various representation of intermediate code. CO1-U (16)
- Or
- (b) Explain in detail the different representation of three address code. CO1-U (16)
14. (a) What is Activation Record in stack allocation and explain each field in it. CO1- U (16)
- Or
- (b) Describe in detail about Heap Management CO1- U (16)
15. (a) Differentiate between copy propagation and constant propagation. What are the benefits of these two methods with respect to optimization? CO1-U (16)
- Or
- (b) Describe peephole optimization with necessary examples CO1-U (16)