

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FIFTH SEMESTER EXAMINATION, MARCH 2022

THIRD YEAR [BATCH 2019-22]

COMPUTER SCIENCE (HONOURS)

PAPER : DSE2

Date : 05/03/2022

Time : 11 am – 1 pm

Full Marks : 50

Answer **any four** questions of the following:

[4×5]

1. a) What is a compiler?
b) What are the two parts of a compiler?
c) Define pre-processor? (2+2+1)
2. a) What are the classifications of a compiler?
b) What is the back-end phase of a compiler?
c) What is a link-editor? (2+2+1)
3. a) Differentiate token, patterns, and lexemes.
b) Write down the operations on languages. (2.5+2.5)
4. a) What are the different error recovery strategies for a lexical analysis?
b) Write down the reason behind separation of lexical and syntax analyser.
c) Write down any two problems of top-down parsing. (2+2+1)
5. a) What is the dangling else problem?
b) What do you mean by handle pruning?
c) Define viable prefix. (2+2+1)

Answer **any three** questions of the following:

[3×10]

6. a) What are the benefits of intermediate code generation?
b) What do you mean by backpatching?
c) What are the various methods of implementing three address statements?
d) What is a DAG? Mention its applications.
e) What do you mean by canonical LR(0)? [2+2+2+(1+2)+1]
7. a) Write down the characteristics of peephole optimization.
b) Write down the issues to be considered while applying the techniques for code optimization.
c) What are the contents of activation record?
d) What are the functions required to construct a predictive parser? Write down the basic difference between them. (2+3+3+2)

8. a) Consider the following grammar

$E \rightarrow E+T \mid T$

$T \rightarrow TF \mid F$

$F \rightarrow F^* \mid a \mid b$

i) Construct the SLR parsing table for this grammar.

ii) Construct the LALR parsing table.

- b) Construct the parse tree and syntax tree for $((a)+(b))$. (5+3+2)

9. a) Consider the following grammar

$S \rightarrow AS \mid b$

$A \rightarrow SA \mid a$

i) Construct the collection of sets of LR(0) items for the grammar.

ii) Construct an NFA in which each state is an LR(0) item from (i). Show that the goto graph of the canonical collection of LR(0) items for this grammar is the same as the DFA constructed from the NFA using the subset construction.

- b) What to do when a parsing table has multiply-defined entries?

- c) What is the main difficulty of predictive parsing? (2+5+2+1)

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