3 (Sem–6/CBCS) CSC HE 3

2024

COMPUTER SCIENCE

(Honours Elective)

Paper : CSC–HE–6036

(System Programming)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions *(by choosing the correct options)* : 1×7=7

   (i) Which one of the following create a single program from several files of relocated machine code ?

   (a) Loaders

   (b) Assemblers

   (c) Link editors

   (d) Preprocessors

(ii) A group of logically related characters in the source program is known as

(a) token

(b) lexeme

(c) parse Tree

(d) pattern

(iii) In compiler, the activities of one or more phases are combined into a single module is known as a

(a) phase

(b) pass

(c) token

(d) unit

(iv) Which of the following tasks are performed by the lexical analyzer ?

(a) Strapping out comments and while spaces

(b) Correlating error messages with the source program

(c) Performing the expansion of macros

(d) All of the above

(v) Any finite set of strings over some specific alphabet is known as

(a) sentence

(b) word

(c) language

(d) character class

(vi) A tool for automatically generating a lexical analyzer for language is defined as

(a) Lex

(b) YACC

(c) Handler

(d) All of the above

(vii) Handle pruning forms the basis of

(a) top-down parsing

(b) bottom-up parsing

(c) Both (a) and (b)

(d) None of the above

2. Answer the following questions : 2×4=8

(a) Name the *four* tasks performed by relocation loader. ½×4=2

(b) Define parsing.

(c) What are the different ways of implementing the three-address code ?

(d) Name the *four* databases used by the intermediate code generation phase. ½×4=2

3. Answer ***any three*** of the following questions : 5×3=15

(a) Differentiate between single-pass and two-pass assemblers.

(b) Write *three* basic tasks performed by the lexical analyser. Show the role of the lexical analyser with the help of a block diagram. 3+2=5

(c) Write algorithm for LR parsing.

(d) What is syntax directed translation (SDT) ? Draw a block diagram showing its conceptual view.

(e) Briefly explain 'stack allocation'. Also write its limitations, if any. 4+1=5

(f) What do you mean by the terms 'token', 'pattern' and 'lexeme' ? Explain briefly. 2+1½+1½=5

4. Answer ***any three*** of the following questions : 10×3=30

(a) Discuss the action taken by every phase of a compiler on the following instruction of source program while compilation into the target program :

Total = Previous + next * 2

(b) Explain the relocation and linking concepts by mentioning a few important points of each with a suitable block diagram. 4+4+2=10

(c) What is LALR parsing ? Write the algorithm for the construction of LALR parsing table. Also write *two* merits and *two* demerits of LALR parser. 2+6+(½×4)=10

(d) Briefly explain *any two* commonly used intermediate code representation methods with suitable diagrams. 5+5=10

(e) What is activation record ? Briefly describe its various fields. Draw a model of activation record showing the required fields. 1½+7+1½=10

(f) What is code generation ? Briefly explain the issues in the design of a code generator. 3+7=10
