

N.B.

- (1) Question no. 1 is compulsory.
- (2) Attempt any 3 from the remaining questions.
- (3) Assume suitable data if necessary.
- (4) Figures to right indicate full marks.

- Q1(a) Differentiate between Application program and system program. Indicate the order in which following system programs are used, from developing program upto its execution. Assemblers, Loaders, Linker, Macro processor, compiler, Editor. 5
- Q1(b) Eliminate Left recursion in the following grammar (Remove Direct and Indirect recursion)
 $S \rightarrow Aa \mid b$ $A \rightarrow Ac \mid Sd \mid \epsilon$ 5
- Q1(c) What is an activation record? Draw diagram of General Activation record and explain the purpose of different fields of an activation record. 5
- Q1(d) What are the different functions of loader. 5
- Q2(a) For a given grammar below, construct an operator precedence relation matrix, assuming *, + are binary operators and *id* as terminal Symbol and E as non-terminal.
 $E \rightarrow E + E$ $E \rightarrow E * E$ $E \rightarrow id$
 Apply operator precedence parsing algorithm for the statement $id + id * id$ 10
- Q2(b) Explain the role of code optimization in compiler designing? Explain Peephole optimization along with an example. 10
- Q3(a) Write a note on JAVA compiler environment. 5
- Q3(b) Write a brief note on Design of an Editor. 5
- Q3(c) Explain synthesized and Inherited attributes used in Syntax Directed Definition. 5
- Q3(d) Find FIRST and FOLLOW Set for given grammar below
 $E \rightarrow TE'$ $E' \rightarrow +TE' \mid \epsilon$
 $T \rightarrow FT'$ $T' \rightarrow *FT' \mid \epsilon$
 $F \rightarrow (E)$ $F \rightarrow id$ 5
- Q4(a) Explain Design of Dynamic Linking Loader along with example 10
- Q4(b) For the following grammar construct LL(1) parser table
 $S \rightarrow F$ $S \rightarrow (S - F)$ $F \rightarrow a$ 10
 And Parse the string $(a - a)$. Show contents of stack and i/p buffer and action taken after each step.
- Q5(a) Explain different pseudo-ops used for conditional macro expansion along with an example 10
- Q5(b) What are the different phases of Compiler? Illustrate compilers internal representation of source program for following statement after each phase
 Position := initial + rate * 60 10
- Q6(a) With reference to Assembler explain following tables with suitable example. (i) POT, (ii) MOT (iii) ST (iv) LT 10
- Q6(b) Explain Backpatching with an example. 10