

17634

11819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Answer each next main Question on a new page.
  - (3) Illustrate your answers with neat sketches wherever necessary.
  - (4) Figures to the right indicate full marks.
  - (5) Assume suitable data, if necessary.

**Marks**

1. (A) Attempt any **THREE** of the following : 12

- (a) Define system software. Explain goals of system software.
- (b) Write first & second pass steps of assembler while stating the problem.
- (c) Explain conditional macroprocessor with example.
- (d) Explain different types of macro arguments.

(B) Attempt any **ONE** of the following : 6

- (a) List all the components of system software. Explain the function of any two components.
- (b) Explain with matrix optimization for the expression & draw tree diagram for

$$\text{cost} = x * (y - z) + 2 * x * (y - z)$$

2. Attempt any **TWO** of the following : 16

- (a) Explain direct linking loaders with example.
- (b) Draw and explain format of MDT, MNT & ALA with any suitable example.
- (c) Explain the databases used in pass-I of assembler with example.

[1 of 4]

P.T.O.

**3. Attempt any FOUR of the following :** **16**

- (a) List & explain functions of storage assignment phase of a compiler.
- (b) State & explain four basic tasks of macroprocessor.
- (c) Draw the flowchart for pass-I of assembler.
- (d) Draw neat labelled diagram of general machine structure & explain the components of it.
- (e) Explain databases used in Lexical phase of compiler.

**4. (A) Attempt any THREE of the following :** **12**

- (a) Explain Bottom-up parser.
- (b) Explain the working of Interpretation phase.
- (c) Write a binary search algorithm with example.
- (d) Explain Interchange sort with example.

**(B) Attempt any ONE of the following :** **6**

- (a) What is Top-Down parsing ? Draw the parse tree for the  $a + b * c$  using top-down parser.
- (b) Explain four algorithmic steps of optimization phase.

**5. Attempt any TWO of the following :** **16**

- (a) Explain absolute loaders with example.
- (b) Draw the block dia. of phases of compiler & state the main function of each phase.

- (c) Write the content of MNT and MDT for the following code :

MNT and MDT for the following code.

MACRO

```

ONE          & ARG
            L      1, & ARG
            A      1, = F '1'
            ST     1, & ARG

```

MEND

MACRO

```

TWO          & ARG1, &ARG2, & ARG3
            ONE    & ARG1
            ONE    & ARG2
            ONE    & ARG3

```

MEND

**6. Attempt any FOUR of the following :**

**16**

- (a) How basic elements are recognized in compilers ?
- (b) What is subroutine linkages, explain it with example.
- (c) Give the format of databases used in loader.
- (d) Explain compile & go loader scheme.
- (e) Show the result of each pass for the following using radix sort :

15, 35, 307, 290, 42, 86, 428, 151

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