

**NTK/KW/15/7442**

**Faculty of Engineering & Technology**  
**Fifth Semester B.E. (Information Technology)**  
**(C.B.S.) Examination**

**SYSTEM PROGRAMMING**

Time—Three Hours]

[Maximum Marks—80

**INSTRUCTIONS TO CANDIDATES**

- (1) All questions carry marks as indicated.
  - (2) Due credit will be given to neatness.
  - (3) Assume suitable data wherever necessary.
  - (4) Illustrate your answers wherever necessary with the help of neat sketches.
1. (a) What are the different instruction formats of IBM 360 machine ? Explain the formats along with example. 7
  - (b) What is the difference between :
    - (i) Procedure and Program
    - (ii) Procedure and Processor
    - (iii) Multiprocessing and Multiprogramming. 6

**OR**

2. (a) What are the advantages and disadvantages of using base register in IBM-360 ? 4
- (b) What is the functional difference between BALR and USING instruction ? 4
- (c) What is an operating system ? State its functions. Explain the different user viewpoints of an operating system. 5
3. (a) Draw and explain the detailed flowchart for Pass 1 of a two pass assembler. 8
- (b) Show the result of each pass for the following list using bucket sort, interchange sort :
- 424, 887, 807, 709, 882, 616, 573, 413, 679, 180, 975, 264. 5

**OR**

4. (a) For the following program :
- (i) Show the symbol table at the end of Pass 1.
- (ii) Show the literal table at the end of Pass 1.

(iii) Show the changes in the base table during Pass 2.

(iv) Generate machine code

```

PROGRAM START
        BALR    15, 0
        BEGIN  USING  BEGIN + 2, 15
        SR      4, 4
        L       3, = F '12'
        LOOP1  L       2, DATA (4)
        A       2, = F '30'
        ST      2, DATA (4)
        A       4, = F '4'
        BCT     3, * -16
        BR      14
        LTORG
        DATA  DC      F '1, 2, 3, 4, 5, 6, 7, 8,
                9, 10, 11, 12'
        END

```

- (b) List various databases used in Pass-2 of assembler. 5

5. (a) Write a short note on any **ONE** :
- (i) Conditional Macro Expansion
  - (ii) Implementation of 1-Pass Macro Processor.
  - (iii) Implementation of 2-Pass Macro Processor.
- 8
- (b) Explain the necessity of stack for implementing macro call within macro definition. 6

**OR**

6. (a) For the following program show MNT, MDT, ALA and expanded assembly language program :

```

MACRO
STORE      & ANS
ST         1, & ANS
MEND
MACRO
TRY        &ADD, &DEST
SR         1, 1
MACRO
& ADD     & A, & B
L         1, & A
A         1, & B

```

MEND

```

& DEST    DS      F
MEND
ARITH     START   0
USING     *, 15
TRY       PLUS, RESULT
PLUS      N1, N2
STORE     RESULT
N1        DC      F '4'
N2        DC      F '5'
END

```

- (b) What is MACRO ? List the features of Macro facility provided by IBN 360/370 ? 6
7. (a) Describe the function of each of the RLD, ESD, TXT and END card and specify the order of these cards. 5
- (b) Write notes on any **TWO** :
- (i) GEST and LESA
  - (ii) Dynamic Loading
  - (iii) Dynamic Linking. 8

**OR**

8. (a) What is direct linking loader ? Discuss the design of a 2-Pass direct linking loader. 8
- (b) Explain the absolute loader scheme with its advantages and disadvantages. 5
9. (a) Explain the following terms :
- (i) Token
- (ii) Pattern
- (iii) Lexeme. 6
- (b) What is cross compiler ? Explain how bootstrapping can be done. 6
- (c) List the databases used in lexical analysis phase of compiler. 2

**OR**

10. (a) What is Lexical Analyzer ? How the tokens are recognized by Lexical Phases ? Explain. 7
- (b) Write a note on any **ONE** :
- (i) YACC
- (ii) Phases of Compiler
- (iii) LEX. 7

11. (a) What is Device Driver ? Explain the necessity of Device Driver. 7
- (b) Differentiate between Character Driver and STREAM Driver. 6

**OR**

12. (a) What are steps to be followed in installing UNIX Device driver ? Explain. 7
- (b) What are the design issues to be considered in designing device drivers ? 6