B.E. (Computer Science Engineering) Fourth Semester (C.B.S.)

System Programming

P. Pages : 3 **NRT/KS/19/3382**

Time : Three Hours * 0 6 4 4 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain Pass 1 of Assembler in detail with the help of flowchart and databases. **8**

b) Explain following terms with help of examples. **6**

i) USING ii) BALR
iii) DS iv) DC
v) LTORG vi) DROP

OR

2. For the given AL code get Base Table Literal Table, Symbol Table, Machine opcode Table along with machine code **14**

```
PROG    START   0
        BALR    15, 0
        USING   *, 15
        LR      5, 15
        LH      1, Data 1
        USING   *, 10
        BR      14
Data 2  DC      F '11'
Data 1  DC      H '22'
PQR     DC      H '23'
BCK     DS      F
MN      EQU     1
XY      EQU     2
        BALR    2, 0
        USING   * + MN, PQR
        LA      7, = A (BCK)
        BR      6
        DC      H '64'
        DROP    XY
        L       9, = A (Data 1)
        A       9, PQR
        LTORG
        ST      9, = F'100'
        END
```

3. a) List the names of databases used in pass 1 and pass 2 of microprocessor. **5**

b) Explain conditional macro expansion and Macro Instruction defining Macro facilities Brief your answer when, how and which MACRO facilities are implemented for a particular AL code. **8**

OR

4. Get MDT, MNT, ALA and expanded code for the following code fragment - **13**

```
        MACRO
        XYZ   & A
        MACRO
        & A             & B
        MACRO
        & B             & C
        ST              15, A (& C)
        BALR            14, 15
        L               1, = F '3'
        A               1, & C
        ST              1, & C
        MEND
        MEND
        MEND
PROG    START
        BALR
          ⋮
        XYZ             MIT
        MIT             HELLO
        HELLO           DI
DI      DC              F'10'
        END
```

5. a) How relocating loader performs the function of loader ? Explain in detail. **5**

b) Why 2 passes are required by direct linking loader ? Draw and explain flowchart of pass 2 of loader. **8**

OR

6. Show the entries in ESD, TXT and RLD card for following program. **13**

```
JOHN    START
        ENTRN     PGA, PGB
        EXTRY     PGC, PGD
        BALR      15, 0
        USING     *, 15
        SR        4, 14
        L         1, FIVE
        A         2, FIVE
        ST        2, FIVE
        BR        14
FIVE    DC        F '4'
PGC     DC        A (PGA + 4)
PGD     DC        A (PGC-PGB)
        DC        A (PGD-PGC)
        DC        A (PGD)
        END
```

7. a) Explain the COFF symbol table and string table. **8**

b) Write a short note on Link editor. **5**

OR

8. a) Explain Source Code Control System (SCCS). **7**

b) Explain the GNU debugger. Enlist the findings concred by GNU debugger. **6**

9. a) Explain the different types of Unix Device Drivers. **8**

b) Explain Gross anatomy of Device Drivers. **5**

OR

10. a) Explain the process of Driver installation on Unix System in detail. **8**

b) Compare the device drivers for Unix and Windows Operating System. **5**

11. a) Explain database and algorithm for lexical phase of compiler. **7**

b) Explain YACC in detail. **7**

OR

12. a) What is cross compiler ? How does it use bootstrapping concept ? **7**

b) Describe a tool for study of Lex. **7**

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