PRS/KS/24/2585

Faculty of Science & Technology

Third Semester B.Tech. (Information Technology) (C.B.C.S.) Examination

SYSTEM PROGRAMMING

Time—Three Hours] [Maximum Marks—70

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Solve Question No. **1 OR** Question No. **2**.

(3) Solve Question No. **3 OR** Question No. **4**.

(4) Solve Question No. **5 OR** Question No. **6**.

(5) Solve Question No. **7 OR** Question No. **8**.

(6) Solve Question No. **9 OR** Question No. **10**.

(7) Due credit will be given to neatness and adequate dimensions.

(8) Assume suitable data wherever necessary.

(9) Illustrate your answers wherever necessary with the help of neat sketches.

1. (a) Define system programming. Explain the components of system programming. 7

   (b) With the help of block diagram explain general machine structure. 7

OR

2. (a) Explain system software development. Also write about the recent trends in software development. 8

   (b) Give and explain different language processing activities. 6

3. (a) What is Assembler ? Give the different types of assembler. 7

   (b) Why Assembler required two passes ? Explain with example. 7

OR

4. (a) Draw and explain the flowchart of pass-2 of a two-pass assembler. 5

   (b) Show the entries in Symbol Table, Literal Table and generated M/C code for the following program :

```
SIMPLE START
         USING *, 15
LOOP     L      1, FIVE
         A      1, FOUR
         ST     1, TEMP
FIVE     DC     F'5'
FOUR     DC     F'4'
TEMP     DS     1F
         END
```

   9

5. (a) Define macro and explain the macro expansion with suitable example. 6

(b) Give comments on "Design of a Macro Assembler". 8

OR

6. (a) With the help of flowchart explain pass-1 and pass-2 of Macro. 10

(b) Give the database used by pass-1 and pass-2 of Macro. 4

7. (a) Explain absolute loader with example. 7

(b) Explain Direct Linking Loader scheme in detail. 7

OR

8. (a) Explain the working of a BSS loader with example. 7

(b) Explain the concept of Dynamic loading and Dynamic linking. 7

9. (a) Explain cross compiler in detail. 6

(b) Draw phase diagram of compiler and explain each phase in detail. 8

OR

10. Write short notes on Debugging Procedures :

(1) Java Language Environment

(2) Java Virtual Machine

(3) Debugging Procedures

(4) Dynamic Debugger. 14

B.Tech. (Information Technology) Third Semester (C.B.C.S.)

System Programming

P. Pages : 2 **PSM/KW/23/2585**

Time : Three Hours * 2 7 8 8 * Max. Marks : 70

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. Due credit will be given to neatness and adequate dimensions.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain evolution of the component of a programming system. **5**

b) Draw and explain in detail general machine structure. **9**

OR

2. a) Explain in detail Language Processing Activities. **5**

b) What is the purpose of system software. **4**

c) Explain program execution. **5**

3. a) Explain in detail algorithm for Pass I of an assembler design. Which pseudo-ops are not processed in Pass I of assembler? Why? **9**

b) Why does assembler require more than one pass over input program? Explain your answer with suitable example? **5**

OR

4. a) What is the difference between. **5**
XYZ DC F'5'
XYZ EQU 5
What is the significance of LTORG pseudo-op?

b) What is the difference in functioning of the BALR and USING instructions? What happens to each at assembly time and execution time? **5**

c) Define the assembler. And list the types of assemblers. **4**

5. a) What are four basic tasks that performed by the macro processor? **5**

b) Explain MDT and MNT with format. **5**

c) Explain macro call within macro with suitable example. **4**

OR

6. Explain in detail:

a) Implementation of 1-Pass Macro Processor. **7**

b) Implementation of 2-Pass Macro Processor. **7**

7. a) Describe the function of each of the following cards. **7**
RLD. ESD, TXT and END cards.

b) Enlist different types of loader schemes and explain any two with suitable diagram. **7**

OR

8. a) What is the purpose of the ID number on the ESD cards? **7**
Why it is not needed for locally defined symbols?

b) Write the concept of Binder, Dynamic loading and Dynamic linking. **7**

9. a) Explain various data structure used in Compilation process. **5**

b) What do you mean by Memory allocation in Compilation? **5**

c) What is cross compiler? Where it is used? **4**

OR

10. Explain in detail. **14**

a) Java Virtual Machine.

b) Debugger & its Benefits.

c) Code Optimization.

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B.Tech. Third Semester (Information Technology) (C.B.C.S.)

System Programming

P. Pages : 1 **MSP/KS/23/2545**

Time : Three Hours * 0 8 3 6 * Max. Marks : 70

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.

1. a) Explain recent trends in software development. **7**

b) Explain various language processing activities. **7**

OR

2. a) Write a short note on search and allocation of data structure. **8**

b) Draw and explain in the levels of system software. **6**

3. a) Draw and explain the flowchart for PASS 1 and PASS 2 Assembler. **7**

b) Write an algorithm for Multi-Pass Assembler. **7**

OR

4. a) Explain the assembler designing criteria. **7**

b) Write a short note on advance assembler process. **7**

5. a) What is MACRO? Explain the features of Macro Facilities with example. **6**

b) Design Two-Pass Macro processors. **8**

OR

6. a) Explain design issues of Macro Processors. **8**

b) Write a short note on Macro Definition and Macro call. **6**

7. a) What is loader? Explain different loading schemes. **7**

b) Explain Absolute loader with neat sketch. **7**

OR

8. a) What is Linker. Explain linking of overlay structured programs. **6**

b) Differentiate between linkers and loaders. **8**

9. a) Write a short note on JAVA Virtual Machine. **6**

b) Explain Code Optimization with neat sketch. **8**

OR

10. a) What is compiler? Explain various data structures used in compiling. **7**

b) What is Debugger? Classify various debuggers. **7**

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B.Tech. Third Semester (Information Technology) (C.B.C.S.) Winter 2022

System Programming

P. Pages : 2 **SPM/KW/22/2545**

Time : Three Hours * 0 8 1 0 * Max. Marks : 70

Notes :
1. All questions carry marks as indicated.
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9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain general Machine Architecture of IBM 360/370. **7**

b) Explain Recent trend in software Development. **7**

OR

2. a) Explain Different instruction format of IBM 360/370 Machine. **7**

b) Draw and Explain level system software. **7**

3. a) Construct MOJ, ST, LT, BTR and generate Machine instruction for following code. **10**

TEST	START	
BEGIN	BALR	15, 0
	USING	BE GIN +2, 15
	SR	4, 4
	L	3, = F' 10'
LOOP	L	2, DATA (4)
	A	2, = F' 49'
	ST	2, DATA (4)
	A	4, = F' 4'
	BCT	3, * -16
	BR	14
	LTROG	
DATA	DC	
	END	F'1,3,3,3,3,4,5,9,0'

b) Explain following Pseudo opcode. **4**
i) USING ii) LTROG iii) DS iv) DC

OR

4. a) Explain in Detail PASS-1 of Assembler with flow chart. **8**

b) Explain the format of following tables used in assembler design. **6**
i) MOT (Machine OP TABLE)
ii) ST (Symbol TABLE)
iii) POT (PSEUDO OP TABLE)

5. a) What are the basic task that any macroprocessor must perform? How do you define macro in a program? Give a general format. **7**

b) Explain the concept of conditional macro expansion with example. **7**

OR

6. a) What are the data base used by the two pass of macroprocessor. **4**

b) GET MDT, MNT ALA and expanded code for the following code fragment **10**

```
        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   D1
D1      DC      F' 10'
        END
```

7. a) Define Loader? Explain different task of Loader. **6**

b) Explain Absolute loader scheme with advantages and disadvantages. **8**

OR

8. a) Explain Direct linking loader scheme. Also discuss about all the cards in detail. **9**

b) Explain Binders and module Loader in detail. **5**

9. a) Explain different phases of compiler design. **8**

b) What is debugger & explain debugging procedure in detail. **6**

OR

10. a) Explain code optimization procedure in detail. **7**

b) Differentiate between compiler & interpreter? Explain various Data structures used in compiler design. **7**

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