53 (CS 501) SYPR

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2019

SYSTEM PROGRAMMING

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any ten** questions.*

1. *(a)* What do you mean by System Programming?

   (b) Explain system software and application software.

   (c) Briefly describe the three components of System Programming. 2+3+5=10

2. *(a)* What do you mean by assembly language and machine language?

Contd.

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(b) Briefly describe the need of assembly language and machine language. 5+5=10

3. (a) Differentiate between Hard RTOS and soft RTOS.

(b) Explain the concept of multiprogramming with example. 5+5=10

4. (a) What is an instruction?

(b) Explain different instruction types of IBM 360. 2+8=10

5. (a) What is the use of base register, index register and offset?

(b) What do you mean by range of address?

(c) Which register of IBM 360 is used as a base register? 5+2+3=10

6. Consider the following assumptions: 10

(i) Program starts from memory location 100

(ii) A value 65 is stored in memory location 1000

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(iii) DATA1 is stored in memory location 1004

DATA2 is stored in memory location 1008

DATA3 is stored in memory location 1012

You need to add value 65 with DATA1, DATA2, and DATA3.

Write an IBM 360 assembly language code for the above scenario and convert the assembly language code to machine language equivalent for IBM 360 machine.

7. (a) What is an assembler?

(b) Briefly explain the tables required for design of an assembler. 2+8=10

8. (a) What is a MACRO?

(b) Explain various features of a MACRO. 2+8=10

9. *(a)* Write MACRO for the following: 5+5=10

```
A   1, DATA 1
A   2, DATA 2
A   3, DATA 3
 :
 :
A   1, DATA 3
A   2, DATA 2
A   3, DATA 1

DATA 1  DC  F'45'
DATA 2  DC  F'46'
DATA 3  DC  F'47'
```

(b) Write MACRO for the following program

```
LOOP 1  A 1, DATA 1
        A 2, DATA 2
        A 3, DATA 3
LOOP 2  A 1, DATA 3
        A 2, DATA 2
LOOP 3  A 1, DATA 1

DATA 1  DC  F'45'
DATA 2  DC  F'46'
DATA 3  DC  F'47'
```

10. *(a)* What is a loader?

(b) Explain various loader schemes. 2+8=10

11. *(a)* Differentiate between compiler and interpreter.

(b) Briefly explain the different phases of a compiler. 4+6=10