53 (CS 501) SYPR

2019

SYSTEM PROGRAMMING

Full Marks : 100

Time : Three hours

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

Question No. **1** *is* ***compulsory.***
Answer ***any eight*** *questions from the rest.*

1. Answer the following questions : 2×10=20

   (a) What is the difference between working register and general registers of IBM 360 ?

   (b) What are the two registers used by memory in IBM 360 ?

   (c) Convert the following Octal number to Hexadecimal number.

   $(234567)_8 = (\ ?\ )_{16}$

Contd.

(d) What is the meaning of the instruction USING * ,15 ?

(e) What are the differences between Hard RTOS and Soft RTOS ?

(f) What is the purpose of PSW (Program Status Word) ?

(g) What is the significance of this instruction ?

BCT 3, *–16

(h) Will the following code snippet adds 10 with 2 ? Justify.

L 3, = F '10'

A 2, = F '2'

ST 3, 1000

(i) What is the difference between pseduo-opcode and machine-opcode ?

(j) Explain the meaning of the following instruction :

L 3, = F '45'

2. What do you understand by system programming ? Describe the components of system programming. 10

3. What do you understand by an Operating System. Explain various functions of operating system. 10

4. Explain the various databases required in the design of an assembler and also mention their uses during the different phases of assembling. 10

5. Explain different storage formats and instruction formats supported by IBM 360 with example. 10

6. With a neat block diagram, explain the working principle of different phases of a compiler. 10

7. 5+5=10

(a) What do you understand by assembly language program and mnemonic machine language program ?

(b) Convert the following assembly language program to mnemonic machine language program :

```
PROG    START
BEGIN   BALR    15, 0
        USING   BEGIN +2, 15
        SR      4, 4
        L       3, TEN
LOOP    L       2, DATA(4)
        A       2, FORTY9
        ST      2, DATA(4)
        A       4, FOUR
        BCT     3, LOOP
        BR      14
TEN     DC      F '10'
FOUR    DC      F '4'
FORTY9  DC      F '49'
DATA    DC      F' 1, 2, 3, 4, 5, 6, 7, 8, 9, 10'
        END
```

8. Explain the various features of a Macro with example. 10

9. What is a loader ? Explain *at least three* different loading schemes available. 10

10. Short answer questions : ***(any two)*** 5×2=10

(a) General Machine Structure

(b) Formal System

(c) Cross Compiler.

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