Course Code : CST 221 **KOLP/RW – 19 / 9508**

Fourth Semester B. E. (Computer Science and Engineering) Examination

SYSTEM PROGRAMMING

Time : 3 Hours] [Max. Marks : 60

Instructions to Candidates :—

(1) All questions carry marks as indicated against them.
(2) Due credit will be given to neatness and adequate dimensions.
(3) Assume suitable data and illustrate answers with neat sketches wherever necessary.

1. (a) What is the user's view of an operating system ? Explain in brief, the following operating system :

(a) Batch Processing.

(b) Time Sharing.

(c) Real time. 10(CO1)

OR

(b) For the following program segments show the equivalent mnemonic machine language and determine the value placed in register 1 by the instruction LH1, DATA2.

```
OCT15  START  0
BALR   15.0
USING*,15
LR     10,15
USING  *,10
LH     I,  DATA2
BR     14
DATA1  DC   H'1'
DATA2  DC   H'2'
DATA3  DC   H'3'
END
```

5(CO1)

(c) What is the difference in functioning of the BALR and USING instructions? What happens to each at assembly time and execution time ? 5(CO1)

2. (a) Write the expanded source (level 1 and level 2) for the following source:

```
:
:
MACRO
ADD1  &  ARG
L1,  &  ARG
A 1,  =  F '2'
ST 1,  &  ARG
MEND
MACRO
ADDS  &  ARG1,  &  ARG2,  &ARG3
ADD1  &  ARG1
ADD1  &  ARG2
ADD1  &  ARG3
MEND
:
:
ADDS  D1,  D2,  D3
:
:
D1  DC  F'10'
D2  DC  F'12'
D3  DC  F'13'
:
```

8(CO1,CO2)

(b) What is the difference between one pass macro processor and two pass macro Processor. 2(CO1)

3. (a) Show the entries in ESD, TXT and RLD Cards for the following Program.

```
JOHN      START
          ENTRY     SUM,DATA
          EXTRN     LOOP,  POINTER
          BALR      15,0
          USING     *,15
          SR        4,14
          L         1,FOUR
          A         2,FOUR
          ST        2,FOUR
          BR        14
FOUR      DC        F'4'
LOOP      DC        A(SUM+4)
POINTER   DC        A(LOOP–DATA)
          DC        A(POINTER)
          END                                    6(CO3)
```

(b) Write about Pass2 of the design of DLL with flowchart. 4(CO1,CO3)

OR

(c) Explain the following (any **Two**) :

(i) Binder.

(ii) Overlay structure.

(iii) Format of Data bases–LESA and GEST. 4(CO3)

4. (a) Given the way to compile the files and obtain an executable by running the command in following sequence:

gcc–c main.cpp

gcc–c armstrong.cpp

gcc–c hello.cpp

gcc main.o Armstrong.o hello.o–ohello

Write a "Makefile" for the same. Also give command to run the make file. 3(CO4)

(b) What is a revision control system ? Explain in detail any one revision control system. 7(CO4)

OR

(c) What is the use of debugger system utility ? What are its types ? Write about the steps involved in debugging. 7(CO4)

5. (a) Describe in detail the anatomy and types of device driver in UNIX SYSTEM. 10(CO1,4)

OR

(b) Draw the neat diagram of the following :

(i) Relationship of application S/W, Kernel, Hardware device drivers and its interfaces in UNIX operating system. 8(CO4)

(c) Write the steps required during Unix driver installation. 2(CO1,4)

6. (a) Classify the types of Compiler. Give the reason for dividing the phases of compiler as front–end and back–end. What is machine dependent object code of a compiler ? 5(CO1,CO2)

OR

(b) Explain the format of databases used in compilation process given below:

(i) Literal table created by optimization phase.

(ii) Uniform symbol table created by the Lexical phase.

(iii) Identifier table created by lexical analysis. 5(CO1)

(c) Explain the concept of cross compilation or cross compiler and bootstrapping, with example. 5(CO1)