BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BE **SEMESTER: VI**
BRANCH: CSE **SESSION : SP/2019**

SUBJECT : CS6103 SYSTEM PROGRAMMING

TIME: 1.5 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) Explain any one CISC machine architecture. [2]

(b) State the target address and value loaded in register A for the following Hex code for SIC(XE) architecture. Let assume (B)=006000, (PC)=003000 and (X)=000090.Hex code=022030 and 03C300. [3]

Memory Status:

Address	Contents
3030	003600
3600	103000
6390	00C303
C303	003030

Q2 (a) Briefly describe the SIC/XE instruction formats. [2]

(b) Suppose ALPHA and BETA are the two arrays of 100 words. Another array of GAMMA stores the smaller elements by comparing the corresponding elements of ALPHA and BETA. Write SIC(XE) program to implement GAMMA. [3]

Q3 (a) "Control section can be loaded and relocated independently". Justify. [2]

(b) Explain in detail machine independent assembler features. [3]

Q4 Write the object program for the following SIC/XE code, assuming that it is to be loaded in memory from address 0058H. The operation codes for the instructions are LDT=74, LDA=00, ADDR=90, SUB=1C, STA=0C and the addresses for registers A and T are 0 and 5 respectively. [5]

```
  LDT   NUM
  LDA   ALPHA
ADDR  T, A
  SUB   #8
  STA   SUM1
  LDA   GAMMA
ADDR  T, A
  SUB   #12
  STA   SUM2

  ALPHA   RESW   1
  SUM1    RESW   1
GAMMA  RESW   1
  SUM2    RESW   1
NUM     RESW   1
```

PTO

Q5 (a) Suppose that an instruction involving a forward reference is to be assembled using Program Counter Relative addressing. How might this be handled by a One Pass Assembler? [2]

(b) Write Pass 2 of two pass assembler in algorithmic form or step by step operations. [3]

Q6 (a) Explain the working of Multi-pass Assembler. [2]

(b) Write short notes on MASM assembler. [3]

:::: 05/03/2019 ::::::E