

Government College of Engineering, Amravati

(An Autonomous Institute of Government of Maharashtra)

Fifth Semester B. Tech. (CS/IT)

Winter – 2015

Course Code: CSU501

Course Name: System Programming

Time: 2 Hrs. 30 Min.*

Max. Marks: 60*

Instructions to Candidate

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary and clearly state the assumptions made.
- 3) Diagrams/sketches should be given wherever necessary.
- 4) Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
- 5) Figures to the right indicate full marks.

1. **Solve any two.**
- a) Describe general machine structure. Draw micro-flowchart for the IBM 360 instruction S (subtract, RX form) 6M
- b) Illustrate the IBM 360 machine data format. 6M
Clarify the use of IBM 360 machine register in formation of addressing memory locations.
- c) What is the difference in function between the BALR and USING instructions? Explain with proper example program? 6M
2. **Solve any two.**
- a) Write an assembly language program to sum the 6M

Contd..

following series and find its equivalent machine translated program.

$$2 + 4 + 6 + 8 \dots \dots 20$$

- b) Write an assembly language program to solve the following mathematical equation and generate the Machine-op Table, Symbol Table, and Literal Table. 6M

$$\text{RESULT} = ((5^2 - \text{FIVE}) + (10^2 - \text{TEN})) / (20^2 - \text{TWENTY})$$

Where RESULT is symbol store result of equation. FIVE, TEN and TWENTY are symbols contain value 5, 10 and 20 respectively. 5, 10 and 20 are the literals.

- c) Draw pass 2 overview design of assembler. Write the purpose and data bases used in pass 2. 6M

3.

Solve any two.

- a) Show the result each ^{of} pass for the following list using shell sort, radix sort and address calculation sort 6M

14, 07, 21, 04, 32, 17, 28, 08, 12, 23

- b) Draw pass 1 processing macro definition and illustrate the format of data structure used in pass 1. 6M

- c) Why assembly language programmer used macros? Explain macro call within macros and macro instruction defining macros. 6M

4.

Solve the following.

- a) To demonstrate Direct Linking Loader, write IBM 360 assembly language program, subroutine name is MAIN which store length of two side of 6M

rectangle in registers number 3 and 4. Subroutine MAIN call the another subroutine AREA which calculate area of rectangle and store the calculated area in register 5. Subroutine MAIN store the calculated area in internal symbol RESULT. Find out contents of ESD, TXT and RLD cards.

- b) Which are the Asynchronous operations in high level language? Explain with example. 6M

Solve the following.

5. a) Define each of the following methods for parameter passing and describe implementation for run-time storage management by:
- i) Call by value
 - ii) Call by reference

- b) Determine the technique needed to implement dynamic storage allocation depend on how storage is deallocated. 6M

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1.

Solve any Two

- a. Explain the general machine structure. Draw micro flowchart for 'BCR' (branch on Condition) IBM 360 instruction. **6M**
- b. What are the differences between following IBM 360 instructions with suitable assembly language example.
 1. BALR and USING
 2. EQU and DC**6M**
- c. Illustrate the IBM 360 Basic Instruction Format with example. **6M**

2

- a. What is the purpose of Pass-1 of Assembler? **6M**
Draw pass-1 overview flowchart write its data structure

Contd...

- b.** Write a IBM 360 Assembly language program for following arithmetic expression and generate MOT table ,Symbol table and literal table
RESULT=(TEN*150 + TWENTY)/(FIVE*100-THIRTY) 6M

5.

3. Solve any Two

- a.** Show the result of each pass of Radix Sort and Radix Exchange sort perform upon the following list
19,11,04,26,01,31,14,10,17,05 6M
- b.** Write IBM 360 Assembly Language logic program for binary Search. An illustrate the demonstration of Binary search for following list
BE, CL, DG, EX, HM, IF, KL, KO, OP, QR
Search CL in given list 6M
- c.** What is the need of Macro in assembly Language programming? justify your answer by example of Defining Macro and their expanded source code
Solve 6M

4. Solve any Two

- a.** What are the problems of Compile and Go Loader? How General loader scheme circumvents that problem 6M
- b.** Illustrate the Relocation loading scheme? Justify with suitable example. 6M
- c.** What are the importance of high level language? How functional modularity achieve in high level language. 6M

5. a. What is the purpose of Compiler? Illustrate **6M** different phases of Compiler with example.
- b. What is activation record? Illustrate the purpose **6M** of each field in activation record.

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1. Solve any Two

- a. Illustrate batch control language and Facilities 6M of operating system as a user viewpoint
- b. Draw and explain the IBM 360 instruction 6M format in detail.
- c. Explain with example address modification 6M using Index register.

2. Solve

- a. Write a 360 assembly code for Interchange sort 6M and implement for following data
19,11,20,26,01,3,14,10,31,05

Cont.

- b.** Write a IBM 360 Assembly language program **6M** for following arithmetic expression and generate MOT table ,Symbol table and literal table
RESULT=(FIVE*150 + EIGHT)/(TEN*100- THIRTY)

- 3.** **Solve any TWO**
a. Draw and explain PASS 2 overview flow chart **6M** of Assembler in detail.

- b.** Draw Pass-2 flowchart for macro processing. **6M** Describe the macro instruction defining macro with example.
- c.** Draw and explain Pass 2 Flowchart of Loader **6M** in detailed.

- 4.** **Solve any Two**
a. What are the basic four function of loader? **6M** How object code is relocating? Illustrate in detail the BSS loading Scheme with example.

- b.** Draw the general model of compiler and **6M** explain various phases of compiler in brief with example.
- c.** What is type system? Illustrate type expression **6M** and type conversion in detail with example.

- 5.** **Solve**
a. What are the parameters used in a general activation record? Explain each in brief with suitable example **6M**
- b.** Explain different Asynchronous operation of **6M** HLL in brief.