Government College of Engineering, Amravati

(An Autonomous Institute of Government of Maharashtra)

Fifth Semester B. Tech. (Computer Science &Engg.)

Summer Term - 2016

Course Code: CSU 501

Course Name: System Programming

Time: 2hr.30min. **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	Draw and Illustrate the Architecture of General Machine Structure.	**6M**
b.	Explain Long way no looping? Justify with example.	**6M**
c.	Draw and explain the Basic 360 instruction format with example.	**6M**

2 Solve any Two

a.	What is the purpose of Pass 2 overview flowchart? Draw the Pass 2 overview flowchart.	**6M**
b.	Write a 360 assembly code for interchange and shell sort. Explain with example.	**6M**

Cont.

c. Draw the pass 2 processing and MACRO call expansion flowchart and explain in detail. **6M**

3 **Solve**

a. What is the need of loader? Explain relocation loader in brief with example. **6M**

b. Write down the assembly code for calculating area of rectangle and convert it into machine code. **6M**

4. **Solve**

a. Draw and explain the various phases of compiler. **6M**

b. Explain type conversion in brief **6M**

5. **Solve any Two**

a. What is the need of storage organization? Give justification with example. **6M**

b Illustrate activation record in brief **6M**

c Illustrate functional modularity and multitasking in brief **6M**

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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.
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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. Clarify the use of IBM 360 machine register in formation of addressing memory locations. 6M

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.

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

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

RESULT = ((5^2 - FIVE) + (10^2 – TEN)) / (20^2 – 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 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. Define each of the following methods for

a) parameter passing and describe implementation for run-time storage management by: 6M

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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Instructions to Candidate

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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. **6M**

1. BALR and USING
2. EQU and DC

c. Illustrate the IBM 360 Basic Instruction Formant with example. **6M**

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

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

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 achive in high level languge. 6M

5.

5. a. What is the purpose of Compiler? Illustrate different phases of Compiler with example. **6M**

b. What is activation record? Illustrate the purpose of each field in activation record. **6M**

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1. **Solve any Two**

a. Illustrate batch control language and Facilities of operating system as a user viewpoint **6M**

b. Draw and explain the IBM 360 instruction format in detail. **6M**

c. Explain with example address modification using Index register. **6M**

2. **Solve**

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

Cont.

b. Write a IBM 360 Assembly language program for following arithmetic expression and generate MOT table ,Symbol table and literal table **6M**

RESULT=(FIVE*150 + EIGHT)/(TEN*100- THIRTY)

3. **Solve any TWO**

a. Draw and explain PASS 2 overview flow chart of Assembler in detail. **6M**

b. Draw Pass-2 flowchart for macro processing. Describe the macro instruction defining macro with example. **6M**

c. Draw and explain Pass 2 Flowchart of Loader in detailed. **6M**

4. **Solve any Two**

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

b. Draw the general model of compiler and explain various phases of compiler in brief with example. **6M**

c. What is type system? Illustrate type expression and type conversion in detail with example. **6M**

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 HLL in brief. **6M**