

**QUESTION PAPER**

**F.Y.BSCIT**

**SEM-I**

**OCT. - 2019**

F. Y. B. Sc. (I. T.) – SEMESTER I  
IMPERATIVE PROGRAMMING  
OCTOBER 2019

14/10/19

IT  
OK

(Time: 2½ hours)

Total Marks: 75

- N. B.: (1) All questions are compulsory.  
(2) Make suitable assumptions wherever necessary and state the assumptions made.  
(3) Answers to the same question must be written together.  
(4) Numbers to the right indicate marks.  
(5) Draw neat labeled diagrams wherever necessary.  
(6) Use of Non-programmable calculators is allowed.

1. Attempt any three of the following: 15
- Write an algorithm to find the greatest of three numbers.
  - Distinguish between Compiler and Interpreter.
  - Write a short note on Assembly Level Language and Low Level Language.
  - What are keywords? Give information about any 5 keywords.
  - State the Structure of a 'C' Program.
  - Temperature of a city in Fahrenheit degrees is accepted from the user. Write a program to convert this temperature into Centigrade degrees.  
(Formula:  $c = 5/9 * (f - 32)$ )
2. Attempt any three of the following: 15
- Write a short note on Arithmetic Operators.
  - Explain the difference between Pre and Post Increment and Pre and Post Decrement Operators along with an example.
  - The length and breadth of a rectangle and radius of a circle are accepted from the user. Write a program to calculate the area of rectangle and circle.
  - Write a short note on C language library.
  - What is the purpose of printf () function? How is it used within a C program?
  - Explain Multiple character input and output along with a program.
3. Attempt any three of the following: 15
- What is a switch case statement? Write a program to input number of the day and it should print name of the day using switch case. (Example: Input 1 and program should print Monday).
  - Write the syntax of a while loop. Write a program to find the sum of numbers from 1 to 100.
  - What are Jump Statements? Explain its types along with examples.
  - What are Functions? Explain its syntax and example.
  - Write a program to find the factorial of a number using recursive function.
  - What do you mean by Call by reference in C? Explain along with program.
4. Attempt any three of the following: 15
- Write a short note on Auto (Automatic) storage class with suitable example.
  - Explain #if-#else-#endif Pre-processor Directive with suitable example.
  - What is a Macro? Write a program in C to find the area of a rectangle and area of a square using macros.
  - Accept 10 numbers from the user. Write program to find out how many numbers are positive and how many are negative using Arrays.
  - Explain the concept of Multidimensional Arrays.
  - Explain strlen (), strcat (), strcmp (), strrev () and strcpy () functions with example.

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15

5. Attempt *any three* of the following:
- a. Explain the concept of Pointers along with the help of a program.
  - b. Write a program to perform addition and subtraction of two pointer variables.
  - c. What is a Structure? Write the syntax to declare a structure. How are Structures different from an Array?
  - d. Write a program to create a structure Employee with employee no, name and Salary. Accept employee no, name and salary from the user and display the same.
  - e. What are Unions in C language?
  - f. What are the different ways of accessing Union Members?

(Time: 2½ hours)

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(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.  
(3) Answers to the **same question** must be **written together**.  
(4) Numbers to the **right** indicate **marks**.  
(5) Draw **neat labeled diagrams** wherever **necessary**.  
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt **any three** of the following: 15

- a. What do you mean by Hexadecimal number system? Explain decimal to hexadecimal conversion with suitable example.
- b. Solve the following:  
i)  $(11011.011)_2 + (01110.001)_2$   
ii)  $(11011) - (10001)$  using 2's complement method
- c. What are weighted and non-weighted number systems? Explain with suitable examples.
- d. Solve the following:  
i)  $(1110)_2 \times (11)_2$   
ii)  $(105)_{10} \div (101)_{10}$
- e. Find...  
i) Octal equivalent of binary  $(11011010.11)_2$   
ii) Gray code equivalent of binary  $(1001)$   
iii) Binary equivalent of hexadecimal  $(CE.A5)$   
iv) Excess-3 code of  $(13)_{10}$   
v) Decimal equivalent of binary  $(10010)$
- f. Perform the following arithmetic operations after converting the numbers to binary number system.  
i)  $(C4F)_{16} + (BA2)_{16}$   
ii)  $(12)_8 \times (7)_8$

2. Attempt **any three** of the following: 15

- a. Construct the logic circuit for the following equation and prepare truth table for it.  
 $Y = (A \cdot \overline{B}) + (B + C)$
- b. Reduce the following using Boolean laws and theorems.  
i)  $Y = AB + A(\overline{B + C})$   
ii)  $Y = \overline{X}(X + Y) + \overline{Z} + ZY$
- c. What is NOR gate? Explain construction of NOT and OR expression using NOR gate.
- d. What is k-map? Simplify the following equation using k-map and realize it using gates.  
 $Y = f(A, B, C) = \sum m(0, 3, 4, 6, 7)$

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- e. Solve the following:
- i) Simplify following using k-map  $Y = f(A,B,C) = \prod M(2,3,4,5,6,7)$
  - ii) Prove the following using Boolean algebra  $(A+B).(A+\overline{B}).(\overline{A}+C) = AC$
- f. Define Ex-OR gate. Draw logic symbol and truth table for it. How to construct EX-OR using Basic gates?

3. Attempt any three of the following:

15

- a. What is full adder? Design a full adder using K-map and also draw the logic circuit for the same.
- b. Write a short note on BCD adder.
- c. With the help of K-map convert 4 bit binary number to 4 bit gray.
- d. Design a logic circuit whose output is HIGH when input is  $> 9$ . Assume that input to the circuit is 4 bit binary  $A_3 A_2 A_1 A_0$
- e. With neat and labeled diagram explain half subtractor.
- f. The input to a combinational logic circuit is a 4-bit binary number. Design a logic circuit with minimum hardware for the following:
  - i) Output  $Y_1 = 1$  if the input binary number is 5 or less than 5
  - ii) Output  $Y_2 = 1$  if the input binary number is 9 or more than 9

4. Attempt any three of the following:

15

- a. Differentiate between Multiplexer and Demultiplexer.
- b. Implement following logic function using 8:1 multiplexer.  
 $f(A,B,C) = \sum m(0,2,3,5,6,7)$
- c. Draw a logic circuit of 4:1 Multiplexer and explain its working.
- d. With neat and labeled diagram explain clocked SR flip flop.
- e. What do you mean by Combinational and Sequential circuits? Explain in detail.
- f. Write a short note on D and T flip flops.

5. Attempt any three of the following:

15

- a. Differentiate between Asynchronous and Synchronous counters.
- b. Explain in brief 4-bit ripple counter.
- c. Write a short note on Buffer registers.
- d. What are different modes of Registers? Explain.
- e. With neat diagram explain the operation of 4-bit SISO (Serial-In-Serial-Out) register. Give the truth table and timing diagram.
- f. Design mod-3 ripple (asynchronous) counter.

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(5) Draw **neat labeled diagrams** wherever **necessary**.  
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1. **Attempt any three of the following:** 15
- a. Write a short note on time sharing operating system.
  - b. Explain process state with suitable diagram.
  - c. Explain system call and its types.
  - d. Discuss history of operating system.
  - e. Explain following scheduler algorithm with example.
    - 1. Shortest job first
  - f. Write a short note on semaphore.
2. **Attempt any three of the following:** 15
- a. write a short note on
    - 1. First Fit
    - 2. Best Fit
  - b. Assume that there are 3 frames in memory and that the following is the page reference string  
7 0 1 2 0 3 0 4 2 3 0  
How many page fault would occurs for the following page replacement algorithms?
    - 1. FIFO
  - c. Explain segmentation concept with suitable diagram.
  - d. Write a short note on path names.
  - e. Write a short note on file system implementation.
  - f. Discuss Paging concept.
3. **Attempt any three of the following:** 15
- a. Explain principle of i/o software.
  - b. Write a short note on Mouse.
  - c. Discuss deadlock prevention.
  - d. Explain following disc scheduling algorithms
    - 1. CSCAN
    - 2. CLOOK
  - e. What is thin client?
  - f. Write a short note on DMA.
4. **Attempt any three of the following:** 15
- a. What is virtualization? Explain its advantages.
  - b. What is network? Explain its protocol.
  - c. Discuss type 2 hypervisors.
  - d. Write a short note on
    - 1. Shared memory multiprocessor
    - 2. Message passing multiprocessor

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- e. Discuss distributed system.
- f. Write a short note on history of virtualization.

5. Attempt *any three* of the following:

- a. Write a short note on file security model in Linux.
- b. Explain history of windows.
- c. Discuss history of android.
- d. Explain process management system call in Linux.
- e. Explain interface to Linux.
- f. Write a short note on Unix

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  - d. Accept 10 numbers from the user. Write program to find out how many numbers are positive and how many are negative using Arrays.
  - e. Explain the concept of Multidimensional Arrays.
  - f. Explain strlen (), strcat (), strcmp (), strcmp (), and strcmp () functions with example.

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  - d. Write a program to create a structure Employee with employee no, name and Salary. Accept employee no, name and salary from the user and display the same.
  - e. What are Unions in C language?
  - f. What are the different ways of accessing Union Members?