

Subject Code: R13105/R13**Set No - 1****I B. Tech I Semester Regular Examinations Feb./Mar. - 2014****COMPUTER PROGRAMMING****(Common to CE, ME, CSE, PCE, IT, Chem E, Aero E, AME, Min E, PE, Metal E)****Time: 3 hours****Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**

PART-A

- 1.(i) What is recursive function? What is drawback of using recursion?
- (ii) Write program to show the usefulness of `getch()` and `getche()`.
- (iii) How are scope rules associated with variables?
- (iv) What is pointer to constant and constant pointer? Are they both same or different.
- (v) Define an array of structure for reading and printing a character, integer and float value.
- (vi) Write a program to read a text file and count the number of characters in the text file.

[4+4+3+4+3+4]

PART-B

- 2.(a) What is structured programming? What are the advantages and disadvantages of structured programming?
- (b) Write a C program that illustrates the local static variables and functions. [8+8]
- 3.(a) What is the purpose of the **do while** and **while** loops? Discuss about their usage. Distinguish between them.
- (b) What is an array of pointers and pointers to an array? Summarize the difference between both of them. [8+8]
- 4.(a) What is an enumerated data type? How is initialization of members to **enum** data type done?
- (b) Describe different file opening modes used with the `fopen()` function. [8+8]
- 5.(a) Explain briefly the features of an algorithm, flowchart and discuss about Program development steps?
- (b) Explain nested, if else and else if ladder with syntax and give examples respectively? [8+8]
- 6.(a) Describe categories of functions based on arguments and return type and what are different parameter passing methods in functions ?
- (b) Give the implementation of multidimensional arrays using pointers. Let the user specify the number of rows and columns for the array for allocating memory dynamically. [8+8]
- 7.(a) Write a C program that defines a structure student with members name, average, address and displays the category of student according to the following criteria
average ≥ 70 ----- Distinction
60 \leq average < 70 ----- First Class
50 \leq average < 60 ----- Second Class
40 \leq average < 50 ----- Third Class
average < 40 ----- Fail
- (b) What is a file and what are different type of files and explain? [8+8]

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PART-A

- 1.(i) What is the difference between %f, %g and %e format specifiers when used to display a real value defined as *float x=12.34*?
- (ii) Initialize an array of integers. Write a program for printing numbers that are greater than the average of the numbers present in the array.
- (iii) Can main() function be called recursively? If so quote an example.
- (iv) What is the difference between *p++ and p++?
- (v) Define a structure to store the following information of a student-
 Roll Number, Name, Grade.
 Demonstrate the named initialization of the structure by writing a program which prints the name and grade of a student given the roll number as input.
- (vi) Write a program to compare two files and print out the lines where they differ.

[3+4+3+4+4+4]

PART-B

- 2.(a) Describe how the rule of type promotion is followed in a typical expression containing mixed types.
 - (b) Illustrate the declaration, initialization of a pointer to a function and calling a function using a function pointer.
- [8+8]
- 3.(a) What is the usage of fgetc(), fputc() and gets(), puts() functions.
 - (b) How is structure passed to a function? Explain.
- [8+8]
4. Explain the following terms
 - (a) User defined functions
 - (b) Predefined functions
 - (c) Header Files
 - (d) C pre-processor
- [4+4+4+4]
- 5.(a) What is a self referential structure and explain with an example ?What is the advantage of using a self referential structure ?
 - (b) Explain various operators in C Programming?
- [8+8]
6. Write a C program that performs binary search on sorted array of elements and trace the program with an example?
- [16]
- 7.(a) What is a pointer, pointer to a pointer and explain the advantages of using pointers ?
 - (b) Explain fseek(), ftell(), rewind(), fclose() file functions.
- [8+8]

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PART-A

- 1.(i) How can the following code be rewritten using conditional operator in C?
 int m=1, n=2, min;
 if (m<n) min=m;
 else min=n;
- (ii) Can arrays be passed to functions? Justify your answer.
- (iii) A number divisible by any number in the range of 2 and $\frac{n}{2}$ then it is considered to be a factor of the number. If the number is prime then the factor is a prime factor. Write a program to print prime factors of a given number.
- (iv) Define an integer pointer array of 10 numbers. Initialize them to any integer values from the key board. Find the sum and average of these 10 integers.
- (v) Write a program using enumerated types which when given today's date will print out tomorrow's date in the form 31st January.
- (vi) Write a program to read a line at a time from a file. Use fgets() function.

[4+3+4+4+4+3]

PART-B

- 2.(a) Draw the flowchart for calculating the area of a equilateral triangle. Area of equilateral triangle is computed by formula $A = \frac{\sqrt{3}}{4} a^2$, where 'a' is the length of the sides of the triangle.
- (b) Demonstrate the usage of sprintf() and puts() library functions with the help of a C program. [8+8]
- 3.(a) Give the recursive and iterative functions to find the factorial of a number.
- (b) How is dynamic memory allocation done in C? What library functions are provided by C for dynamic memory allocation? [8+8]
- 4.(a) What is a enumerated data type? How is the initialization of members to **enum** data type done?
- (b) Explain about bit-fields in 'C' [8+8]
- 5.(a) A Fibonacci sequence is defined as follows:
 1, 1, 2, 3, 5, 8,
 Write a program for computing the Fibonacci number sequence using recursion
- (b) Write a C program that performs all arithmetic operations based on user choice using switch case? [8+8]
- 6.(a) What are iterative statements and explain the difference between while and do while loops?
- (b) Write a C program that swaps two numbers using pointers? [8+8]
7. Describe the following (a) putc() (b) getc() (c) putw() (d) getw() [4+4+4+4]

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PART-A

- 1.(i) Write an algorithm for computing the sum of the series $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$ upto N terms.
- (ii) Why do array subscripts start at 0 instead of 1?
- (iii) Compare recursion with iteration.
- (iv) What is wrong with the following code segment?

```
int *p;
*p=10;
```
- (v) Write a program using structures and functions to compare two dates.
- (vi) What happens if anyone doesn't close a file?

[4+3+4+4+4+3]

PART- B

- 2.(a) What are the advantages and limitations of using flow charts?
- (b) What is a multidimensional array? How is it initialized? How are the elements of multidimensional arrays stored? Comment on the accessing of the elements.
[6+10]
- 3.(a) Describe the Towers of Hanoi problem. Write a function to solve the Towers of Hanoi problem with 3 disks.
- (b) Write a program that calculates sum of array elements where array elements can be accessed using a pointer to an array?
[8+8]
- 4.(a) How is a structure variable different from an array with respect to its use as a function parameter?
- (b) Write a C program that calculates GCD of two numbers using a recursive function?
[8+8]
- 5.(a) Write an algorithm and C program to calculate roots of a quadratic equation and explain how to compile and the run above program?
- (b) Write a C program that calculates the product of two matrices and displays it?
[8+8]
- 6.(a) Explain character pointer and pointer to a function with examples?
- (b) Write a C program that reads n numbers and writes even numbers into one file EVEN.txt and odd number into another file ODD.txt?
[8+8]
- 7.(a) Write a C program that copies the content of one file into another file?
- (b) Write a C program that defines a structure-student with members-name, average, address where address is inner structure that contains dno, street, city as members, read the student details and display the output -student name and his city as follows:

Student name	city
X	zzz
Y	www

[8+8]