

I B. Tech II Semester Regular/Supply Examinations July/Aug. - 2015

COMPUTER PROGRAMMING

(Common to ECE, EEE, EIE, Bio-Tech, E Com. E, Agri. 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**

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**PART-A**

- 1.(a) Which of the following expressions are valid? Give reasons.  
(i)  $+a +b$  (ii)  $a++ - b$  (iii)  $a \% 10 / - b$  (iv)  $a++ + ++b$
- (b) What are the values of control variables and number of the iterations in the following for loops?  
(i)  $\text{for}( x=1.0 ; x>=0.5; x - = 0.1)$  (ii)  $\text{for}( ch= 'A' ; ch != 'F' ; ++ch)$
- (c) Define function for determining the median of three given numbers.
- (d) Write a swap function along with a loop to reverse a vector.
- (e) Is it possible to declare two structures with the same name? Justify your answer.
- (f) State the functions for direct file I/O.

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

**PART- B**

- 2.(a) Give the flowchart to count positive and negative numbers in a given list terminated with zero.
- (b) Write a program to calculate the area and circumference of a circle with radius 10. [8+8]
- 3.(a) Write a for loop to calculate the sum of squares of differences of consecutive numbers entered from the keyboard, e.g., for numbers 1, 4, 5 and 3, the program should calculate  $(4 - 1)^2 + (5 - 4)^2 + (3 - 5)^2$
- (b) Describe the basic operations on arrays. Explain how they can be implemented using loops. [8+8]
- 4.(a) Describe the concept of functions and the mechanism of a function call. Discuss the advantages of functions.
- (b) How is *const* parameter used? Explain. [10+6]
- 5. What functions are provided in *stdlib.h* header file for providing dynamic memory management? Explain each function with an example. [16]
- 6. How do you define a structure, structure variables, access their elements and perform operations on them? Explain with examples. [16]
- 7.(a) What is meant by formatted I/O?
- (b) Write a program to generate prime numbers in a given range and append them to primes.dat file and display the file. [6+10]

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**PART-A**

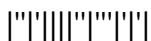
- 1.(a) Evaluate the expressions given below if a=10, b=20:  
(i) ++a+b-- /2.5    (ii) a/b + (a/(2 \* b))    (iii) a % 6 / b%3
- (b) Write the equivalent while loop for the following for loop:  
`for( ch = 'a'; ch <= 'z'; ++ch)`  
`putchar(ch);`
- (c) Define a recursive function to determine the sum of non-negative integer number n.
- (d) Write the code for accepting an array of integers and return a pointer to its largest element.
- (e) What is the basic difference between an array and a structure?
- (f) What functions are used for character I/O?

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

**PART- B**

- 2.(a) Write a program to determine the real roots of a quadratic equation  $ax^2+bx+c=0$
- (b) What is a conditional expression operator? Use conditional expression operator to determine the number of days in February. [8+8]
- 3.(a) Explain how arrays are used as function parameters with examples.
- (b) Compare switch and if-else-if statements. [8+8]
- 4.(a) What is register storage class and static storage class? Explain with examples.
- (b) Write a recursive function to obtain the solution for the Tower of Hanoi problem. [8+8]
- 5.(a) What are the limitations of arrays? Explain how dynamic arrays overcome these limitations.
- (b) How are increment and decrement operations implemented with pointers? [8+8]
- 6. How do you declare, initialize and access a structure containing arrays? Explain with examples. [16]
- 7.(a) Write the syntax of functions `fclose`, `fprintf`. and explain their purposes.
- (b) What functions are used for file positioning? State the SEEK\_ Constants used in `fseek` function and explain the meaning. [8+8]

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**PART-A**

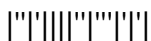
- 1.(a) What is a preprocessor directive?
- (b) Write assignment statement for the following:  
Assign a value of 1 to divisor if digit is a divisor of num; otherwise, assign a value of 0.
- (c) What is an extern storage class? Explain.
- (d) What is an address operator and dereference operator?
- (e) What is the similarity between structure, union and enumeration?
- (f) Describe *fgetc* function and *getc* macro.

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

**PART-B**

- 2.(a) Illustrate how you read data values into a program and to display results with examples.
- (b) What is a format string? How do you write format strings for data entry and display?  
[8+8]
- 3.(a) Write a program that asks user an arithmetic operator('+', '-', '\*' or '/') and two operands and perform the corresponding calculation on the operands. Use a switch statement.
- (b) Write a C program to check whether a number entered by user is even or odd. Use a if else statement.  
[8+8]
- 4.(a) Give a recursive function for computing the  $n^{\text{th}}$  Fibonacci function.
- (b) Explain what would happen if the terminating condition for function Fibonacci were just  $(n==1)$ .  
[8+8]
- 5.(a) What is a pointer? What are the advantages of pointers?
- (b) Write a program to read an array from the keyboard, access elements of an array and copy array into another array using pointers.  
[6+10]
- 6.(a) What are the two types of operators used for accessing members of a structure? Explain with examples.
- (b) How are structures nested in structures? Write a nested structure to represent a rectangle.  
[8+8]
- 7.(a) What is a stream? Why is it necessary to use buffering in streams?
- (b) Write a C program to write all the members of an array of structures to a file using *fwrite()*. Read the array from the file and display on the screen.  
[8+8]

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**PART-A**

- 1.(a) What data types would you use to represent the following items: number of children at school, a letter grade on an exam, the average number of school days a child absent each year?
- (b) Evaluate the expression:  $1 \ \&\& \ (30 \% 10 \geq 0) \ \&\& \ (30 \% 10 \leq 3)$
- (c) Which is generally more efficient, recursion or iteration?
- (d) Explain the functionality of *realloc* function.
- (e) What is a self referential structure?
- (f) Define *fputc* function and *putc* macro.

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

**PART-B**

- 2.(a) Explain with examples how C evaluates arithmetic expressions and how are they written in C?
- (b) Name three high level languages and describe their original usage. [8+8]
- 3.(a) Write a C program to find average of maximum of n positive numbers entered by user. But, if the input is negative, display the average(excluding the average of negative input) and end the program.
- (b) How does for loop work in C? Illustrate with examples. [10+6]
- 4.(a) Write a recursive C function that counts the number of vowels in a string.
- (b) How are 2D arrays passed to functions? Explain. [8+8]
- 5.(a) What is call by reference? Write a program to swap numbers in cyclic order using call by reference.
- (b) How is a dynamic two dimensional arrays implemented using a pointer to pointer? [8+8]
- 6.(a) Describe the two ways of accessing a structure member through a pointer. Give an example.
- (b) Give an example to use structure's member through pointer using malloc() function. [8+8]
- 7.(a) What is a binary file? Explain why a binary file containing numeric data will require less space compared to a text file containing same data.
- (b) Write a C program to read name and marks of n number of students from user and store them in a file. If the file previously exists, add the information of n students. [8+8]

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