Code No: 09A1EC01   R09   SET-1

B. Tech I Year Examinations, December-January, 2011-2012
COMPUTER PROGRAMMING AND DATA STRUCTURES
(COMMON TO CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, MCT, ETM, MMT, ECOMPE, AE, ICE, BT, AME, MIE, MIM)

Time: 3 hours   **Max. Marks: 75**
Answer any five questions
All questions carry equal marks
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1. a)   Explain different categories of an algorithm with an example?
   b)   What are the differences between signed and unsigned data types, list out them?   [15]

2. a)   Explain the types of operators available in C?
   b)   Write a C program with Exclusive OR operation between the two integers and display the result?   [15]

3. a)   What are the formatted and unformatted functions? What are the escape sequences?
   b)   Define Recursion? Write a C-Program to find the factorial of a number using Recursion?   [15]

4. a)   Describe the features of pointers? Explain an array of pointer with an example?
   b)   Write a C program to accept string using character pointer and display it?   [15]

5.   Write C-structures for departmental store application. Each departmental store contains departmental store Id (3 characters), store location (string), items (structures) and number of items. A store can offer 1 to 1000 items. Each Item contains Item code (4 characters), current stock, unit of measure in the following set (Single, dozen, kilogram, liter, meter, square meter) and price. Using this structure, Write C- function to count the number of items whose price is above the given amount.   [15]

6. a)   Write C-language program that reads a C-program file and outputs number of lines in the program.
   b)   List and explain the streams functions for binary files along with their prototypes. [15]

7. a)   Write an algorithm or program for sorting integers using bubble sort.
   b)   Show the bubble sort results for each pass for the following initial array of elements.
         3 5 18 7 1 2 5 23 16 3 1   [15]

8. a)   Write an algorithm for evaluating postfix expression. Demonstrate your algorithm with stack contents for each operation using the post fix expression 2 3 5 + *
   b)   Explain about i)   Stack   ii)   queue.   [15]

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1. a) What is meant by compilation ? Explain in detail?
   b) What are the C keywords? Elaborate them?   [15]

2. a) What are unary operators and their uses? Describe logical operators with their return values?
   b) Write a C program to shift inputted data by 2 bits left?   [15]

3. a) Compare different ways of passing parameters with an example.
   b) What are Storage classes? Explain different types of Storage Classes? Compare them?   [15]

4. a) Discuss the different arithmetic operations with pointers? Explain the comparison of two pointers?
   b) Write a C program to display all the elements of an array using a pointer?   [15]

5. Write C-structures for the College data. College contains the following fields:
   College code (2characters), College Name, year of establishment, number of courses and courses. A College can offer 1 to 50 courses. Each course is associated with course name (String), duration, number of students. The number of students in the college is sum of number of students in all the courses in the college. Write a function
                    *int collegeStrength(struct College *c)*
   that returns the number of students in the college pointed by c.   [15]

6. a) What are the different Input/output operations on Files ?
   b) How the data is searched in sequential files? Mention the different techniques used with an example.   [15]

7. a) Write a program to explain selection sort . Which type of technique does it belong?
   b) Write a C program that implements a binary search?   [15]

8. Write a program to evaluate the following expression A / B * (C + D) / A to prefix using stack.   [15]

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1. a) Define Algorithm and Flow Chart?
   b) A utility company charges its customers based on their monthly utilization in terms of units as follows:
   Description charge:
   First 100 units Rs.10 per unit
   Next 200 units Rs. 9 per unit
   Next 200 units Rs.8 per unit
   Next units Rs.7 per unit
   Write an Algorithm and flowchart that reads monthly units of a customer and output the charge amount.　　　　　　　　　　　　　　　　　　　[15]

2. a) What are various conditional and bitwise operations in 'C', explain them with an example?
   b) Explain various looping statements in 'C' language with example?　　[15]

3. What are various arithmetic and assignment operators in 'C', explain them with an example.　　　　　　　　　　　　　　　　　　　　　　　[15]

4. a) What is an array? What are different types of array? Explain with examples?
   b) What is a pointer? Define pointer-pointer concept with the help of an example?　[15]

5. Write a program using structures to display following information for each student name, Roll-number, mark1, mark2, mark3, total, average?　　　　　[15]

6. Describe various types of files with an example for each?　　　　　[15]

7. Explain the Merge sort algorithm with the help of an example?　　　[15]

8. Write a 'C' program to implement stack operations (Push and Pop)?　　[15]

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1. a) Define the flow chart? Draw a flow chart for finding roots of a quadratic equation with all cases?
   b) What are various conditional and relational operators in 'C', explain them with an example.   [15]

2. a) Explain the control statements in 'C' language with an example?
   b) Explain various looping statements in 'C' language with example?   [15]

3. a) Explain briefly auto and extern storage classes with examples?
   b) Write short notes on scope of variables?   [15]

4. a) What is an array? What are different types of array? Explain with examples?
   b) Write a 'C' program using pointer to perform string comparison?   [15]

5. What is a structure? Give its advantage? Give an example of creating and accessing members of a structure?   [15]

6. Elaborate file handling functions in 'C' with the help of sample code?   [15]

7. Explain the Quick sort algorithm with the help of an example?   [15]

8. Write a 'C' program to implement Queue operations (Insert and Delete)?   [15]

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