Code: 9A05101

B.Tech I Year (R09) Regular & Supplementary Examinations, June 2013
PROGRAMMING IN C AND DATA STRUCTURES
(Common to all branches)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1   What is secondary storage? What are the reasons for having secondary storage devices? Explain different secondary storage devices.

2   (a)   Write a program to generate prime numbers between 1 and 1000.
    (b)   What is conditional operator? Write a program to enter two numbers and find the smallest out of them. Use conditional operator.

3   (a)   Write a program to find the average marks obtained by a class of 50 students in a test.
    (b)   What is an array? How is a one dimensional array declared and initialized?

4   (a)   What is a pointer? What are the features of pointers? Write a C program to print address of a variable.
    (b)   Explain the declaration of pointers with examples.

5   Discuss below terms with examples:
    (a)   Nested structures.
    (b)   Array of structures.

6   (a)   Write a program to display the contents of the file in reverse.
    (b)   Write a program to read and print text file of integers.

7   (a)   What is circular queue?
    (b)   What are the advantages of circular queue over linear queue?
    (c)   Write a program implementing circular queue.

8   (a)   Apply insertion sort to the list of integers found in a file. Write the sorted output to the file.
    (b)   Justify the fact that the efficiency of quick sort is O(logn) under best case.

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1 (a) What is central processing unit? What are its major roles?
   (b) With a neat explain flow of information during program execution.

2 (a) What is a string constant? How do string constants differ from character constants? Do string constants represent numerical values?
   (b) Write a program whether the given number is "Even" or "Odd" using GOTO statement.

3 (a) Write a program to find the total of an array called prices which contains the list of prices of 25 items.
   (b) Explain with an example function with no arguments and no return values.

4 (a) Write a C program to show that pointer of any data type occupies same space.
   (b) With proper examples explain different arithmetic operations on pointers.

5 (a) Define union. Give the general template for union.
   (b) List out the differences between unions and structures.

6 (a) Why we cannot use relation and logical operators in structure variable?
   (b) Write a C program to illustrate the concept of structure within structure.

7 (a) Explain the various operations on a stack.
   (b) Write a program implementing stack.

8 (a) Write a program in C using functions to apply merge sort to the given arrays of integers.
   (b) Discuss linear search algorithmic technique with an example.

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1 (a) Write an algorithm to generate Fibonacci series of numbers up to 'n'.
   (b) Write an algorithm to find whether the given number is prime or not.

2 (a) What are different types of integer constants? What are long integer constants? How do these constants differ from ordinary integer constants? How can they be written and identified?
   (b) Write a program whether the given number is "Even" or "Odd".

3 What is a function? What are the types of functions? What is the advantage of functions? Explain any two built in functions with an example.

4 (a) Explain the concept of pointer to pointers with examples.
   (b) Explain the concept of void pointers with examples.

5 (a) What is union in C?
   (b) How data elements are stored under unions with example?
   (c) With example discuss how to use structure within union.

6 Write a C program that uses fseek () function to alter the file pointer in multiples of 2 and copy those contents into a new file.

7 (a) Explain the various operations on queue.
   (b) Write a program to implement a queue using an array.

8 (a) Define binary searching method.
   (b) Write a program in C using functions to perform quick sort in a given list of integers.

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1 (a) Write an algorithm to find the root of a quadratic equation for all the cases.
   (b) Draw the flow chart to find the roots of a quadratic equation for all the cases.

2 (a) What is a variable? How can variables be characterized? Give the rules for variable declaration.
   (b) What are tokens? What are the types of 'C' tokens? Explain briefly.

3 (a) What are the advantages and disadvantages of recursion?
   (b) Write a program to find the sum of all floating point elements in an array.

4 (a) Write a C program to read and print an array of elements using pointers.
   (b) Explain the concept of array of pointers with examples.

5 (a) Explain the memory allocation of variables in a union.
   (b) What are the different ways of passing entire structure to a function with an example?

6 (a) Write a program in C to rename a file.
   (b) Discuss command line arguments in detail with examples.

7 (a) What are the applications of singly linked list?
   (b) Write a program in C to create a singly linked list with header.

8 (a) Write a program in C to perform binary searching method.
   (b) Compare the efficiencies of linear and binary searching methods.

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