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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 71672

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Second Semester

Computer Science and Engineering

CS 6202 – PROGRAMMING AND DATA STRUCTURES – I

(Common to Information Technology)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the output of the code and justify the answer.

```
#include<stdio.h>
main( )
{
    char const *st="HeIlo";
    *st= 'M';
    printf(%c\n", st);
    st = "Bye";
    printf("%s\n", st);
}
```

2. Identify the errors in the following Preprocessor statements.

- #define ABS(x) (x>0)?(x) : (-x)
- #ifdef(FLAG)
  #undef FLAG
  #endif

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3. State the output of the code and give the explanation.

```
#include<stdio.h>
main( )
{
    struct aa
    {    int x; char y;  };
    struct bb
    {    int z;    };
    union A
    {    struct aa a; struct bb b;  }B;
    B.a.x = 512;
    Printf("%d %d %d", B.a.x, B.a.y, B.b.z);
}
```

4. Mention the different file opening modes in C.

5. Define abstract data type.

6. What are the advantages and disadvantages of linked lists over arrays?

7. Define stack. List some of the applications of stack.

8. What are double ended queues?

9. Sort the following numbers using insertion sort.
   3, 1, 4, 1, 5, 9, 2, 6, 5

10. Give the significance of extendible hashing.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Write a C program using functions to add two matrices and return the resultant matrix to the calling function. (8)

    (ii) Write a C Program to implement any four string handling functions using functions and pointers. (8)

Or

(b) (i) Write a program to convert all the upper-case letters to lower-case and vice versa in a given string. (8)

(ii) Explain about how to declare pointer to a function with an example. (8)

12. (a) Define a structure to store details of 10 bank customers with customer name, account no., balance, and city. Write a C program to store the details of the customer in the bank, access and print the customer details for a specified account no. (16)

Or

(b) (i) Write a C-program to read the contents of file "in.txt" and write the contents to a file "out. txt". (8)

(ii) Explain about file manipulators with snippet code for each. (8)

13. (a) Develop a C program to split a linked list into two sub lists containing odd and even ordered elements in them respectively. (16)

Or

(b) Write a C program to add two polynomials using linked list. (16)

14. (a) (i) Write an algorithm to convert the infix expression to postfix expression using stack. (8)

(ii) Simulate the conversion of infix to postfix expression using stack for the following expression : (8)

3 – (4 / 2) + (1 * 5) + 6

Or

(b) (i) Formulate an ADT to implement Queue using inked list. (8)

(ii) Write a C Program to implement the circular queue using arrays. (8)

15. (a) (i) Sort the following sequence using quick sort. (8)

3, 1, 4, 1, 5, 9, 2, 6, 5, 3, 5

(ii) Write a C program to search a number with the given set of numbers using binary search. (8)

Or

(b) Illustrate with example the open addressing and chaining methods of collision resolution techniques in hashing. (16)

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04/06/18 AN

Reg. No. :

Question Paper Code : 40899

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Second Semester
Computer Science and Engineering
CS6202 – PROGRAMMING AND DATA STRUCTURES – I
(Common to : Information Technology)
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. What are the advantages and limitations of using functions in a program ?
2. What are the preprocessor derivative ?
3. Differentiate structure and union.
4. In what different modes files can be opened using fopen function ?
5. Define Abstract Data Type (ADT). What are the advantages of using ADT ?
6. What are the disadvantages of using simple array implementation of lists ?
7. Differentiate Stack and Queue ADT.
8. List and justify any two real world applications of Queue ADT.
9. Compare Bubble Sort, Insertion Sort, Merge Sort and Quick Sort in terms of their average and worst case time complexities.
10. Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function h (x) = x mod 10, show the resulting Separate Chaining hash table. Assume that the collisions are added to the end of the list.

PART – B **(5×16=80 Marks)**

11. a) Explain function pointers in detail, highlighting their need, use and advantages with an example. **(16)**

(OR)

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b) i) Write a C program to implement the function int Myatoi (const char *str) which converts given string into an integer, without using C's atoi library function. Assume that given string contains a positive integer only. Write appropriate main() function and trace your program for the input string "30462". **(8)**

ii) Write a C program to find roots of a quadratic equation ($ax^2 + bx + c$) when a, b and c values are given. Assume that the roots are real numbers. **(8)**

12. a) Write a C program to implement the following. **(16)**

1) Define a structure for employees with employee ID number (integer), name (64 characters), salary (floating point value) and performance rating (valid values are integers 1, 2, 3, 4 and 5).

2) Get user input entries for 100 employees to get ID, name, salary and performance rating value.

3) Then allow user to search using employee ID. Once the matching employee is found, print all details about the employee. Continue till user wants to continue searching.

4) Then compute bonus amount for each employee, using table below. Finally display all employee IDs and their corresponding bonus amounts.

Performance rating	Bonus percentage on salary
1	5
2	10
3	15
4	20
5	25

(OR)

b) i) Write a C program to concatenate the content of two text files into a third file. **(8)**

ii) Define the following terms with respect to file handling, with an example each.

1) Data Field **(2)**

2) Record **(2)**

3) File **(2)**

4) File Access Method **(2)**

13. a) Implement Singly Linked List with insert, delete and display operations. Trace your code for inserting 1, 2, 3, 4, 5 in an initially empty singly linked list, delete 4 and then display the remaining values in the list. **(16)**

(OR)

b) Discuss how to represent single-variable polynomials using linked lists. Provide C program to add two polynomials. With an example show that your code works. **(16)**

14. a) Illustrate implementation of queue along with algorithms for insert (enqueue) and delete (dequeue). **(16)**

(OR)

b) Write a C implementation for circular queue. **(16)**

15. a) i) Provide recursive algorithm for merge sort. **(8)**

ii) Using the merge sort algorithm sort the following and provide detailed tracing : 39, 9, 81, 45, 90, 27, 72, 18. **(8)**

(OR)

b) Explain Collision Resolution by Open addressing Linear Probing. Consider a hash table of size 10. Using linear probing, insert the keys 72, 27, 36, 24, 63, 81, 92 and 101 into the table. **(16)**

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Reg. No. :

Question Paper Code : 52856

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Second Semester

Computer Science and Engineering

CS 6202 — PROGRAMMING AND DATA STRUCTURES – I

(Common to Information Technology)

(Regulation 2013)

(Common to PTCS 6202 – Programming and Data Structures – I for B.E. (Part-Time) – First Semester – Computer Science and Engineering – Regulation 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate between call by value and call by reference.
2. What are preprocessor directives? Give examples.
3. Write a C program to read a single character from a file.
4. Differentiate between random access and sequential access file.
5. Define abstract data type.
6. What are the advantages and disadvantages of linked lists over arrays?
7. Write the syntax of Calloc ( ) and Realloc ( ) and mention its application in linked list.
8. Given the prefix for an expression, write its postfix :
   $-*-+a\ b\ c\ /\ e\ f-g/h\ i$
9. What is Rehasing?
10. Compare linear search and binary search.

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PART B — (5 × 16 = 80 marks)

11. (a) (i) Write a C program using functions to add two matrices and return the resultant matrix to the calling function. (8)

(ii) Write a C program to implement any four string handling functions using functions and pointers. (8)

Or

(b) (i) Write a program to convert all the upper-case letters to lower-case and vice versa in a given string. (8)

(ii) Explain about how to declare pointer to a function with an example. (8)

12. (a) (i) Create a structure complex (data members-real and imag). Write a function to add two complex numbers, which will take 2 complex numbers as arguments and return the complex number. (8)

(ii) Create a structure employee (data members-Name and Salary). Write a function, using array of objects get 5 employees details and display them. (8)

Or

(b) (i) Write a program to read a file and count the number of characters and lines in it. (8)

(ii) Give the format and use of the following File Handling operations in C : fopen(), fread(), fwrite() and fseek(). (8)

13. (a) Write C code for singly linked list with insert, delete, display operations using structure pointer. (16)

Or

(b) Illustrate the algorithms to implement the doubly linked list and perform all the operations on the created list. (16)

14. (a) Develop an algorithm to implement Stack ADT. Give relevant examples with diagrammatic representations. (16)

Or

(b) (i) Write an algorithm to implement circular queue using arrays. (10)

(ii) Show the simulation using stack for converting the expression $p^*q+(r-s/t)$ from infix to prefix. (6)

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15. (a) (i) Sort the given integers and show the intermediate results using shell sort (8)

35, 12, 14, 9, 15, 45, 32, 95, 40, 5

(ii) Write C code to soft an integer array using shell sort. (8)

Or

(b) (i) Write a C Code to perform binary search. (10)

(ii) Explain the rehashing techniques. (6)

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Question Paper Code : 80286

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Second Semester

Computer Science and Engineering

CS 6202 — PROGRAMMING AND DATA STRUCTURES – I

(Common to Information Technology)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate between call by value and call by reference.
2. What are preprocessor directives? Give examples.
3. Write the different file manipulators.
4. Mention the functions for opening the file in read mode.
5. What is an ADT?
6. What is data structure? How it is classified?
7. Define Queue.
8. Give any two applications of stack.
9. Name the sorting techniques which use the divide and conquer strategy.
10. What is the difference between linear search and binary search?

PART B — (5 × 16 = 80 marks)

11. (a) Explain functions with variable number of arguments in detail. Write a C program to find the sum of n numbers using functions with variable number of arguments. (16)

Or

(b) Explain the following:

(i) Function pointer in C (8)

(ii) Control Statements in C. (8)

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12. (a) (i) What is a structure? Write a C program to add and subtract the two complex numbers using structures. (8)

(ii) Explain the concept of random access files with an example. (8)

Or

(b) Store ten names of students in a file called 'data .txt'. Perform operations to sort their names alphabetically. Write the sorted names into another file called 'names .txt'. Display the names from 'names .txt' by opening the file in read mode. Close the files after performing all operations. (16)

13. (a) What is singly linked list? Write a C program that uses functions to perform the following operation on singly list with suitable diagrammatic representations. Consider all cases:

(i) Insertion (ii) Deletion (iii) Traversal in both ways. (16)

Or

(b) Illustrate the necessary algorithms to implement doubly linked list and perform all the operations on the created list. (16)

14. (a) Develop an algorithm to implement Stack ADT. Give relevant examples with diagrammatic representations. (16)

Or

(b) (i) Write an algorithm to implement circular queue using arrays. (10)

(ii) Show the simulation using stack for converting the expression p*q+(r-s/t) from infix to prefix. (6)

15. (a) (i) Sort the given integers and show the intermediate results using selection sort. 45, 25, 10, 2, 9, 85, 102, 1. (8)

(ii) Write a C code to sort an integer array using selection sort. (8)

Or

(b) What is hashing? Explain open addressing and separate chaining methods of collision resolution techniques with examples. (16)

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04/12/18 (AN)

Reg. No. :

Question Paper Code : 20357

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Second Semester

Computer Science and Engineering

CS 6202 — PROGRAMMING AND DATA STRUCTURES — I

(Common to Information Technology)

(Regulations 2013)

(Also Common to PTCS 6202 – Programming and Data Structures I for B.E. (Part-Time) First Semester-Computer Science and Engineering - Regulations 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a pointer? Give an example for pointer declaration and initialization.
2. Define a function to swap two integer numbers.
3. Differentiate structure and union.
4. List atleast four functions used in C language to open, process and close a file.
5. How an ADT differs from regular data type?
6. What is a linked list? Illustrate with a diagram.
7. Define a stack and outline the operations that can be performed on a stack.
8. What are the advantages of double ended queues?
9. Outline the differences between merge sort and quick sort., w.r.t time complexities.
10. How hasting is performed using open chaining?

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PART B — (5 × 16 = 80 marks)

11. (a) Write a C program using function(s) to accept two matrices, check whether the dimensions of both the matrices match, perform matrix addition and print the result. (16)

Or

(b) (i) Write a C program using function(s) to accept an array of '*n*' numbers, sort the numbers in ascending order and display the result. (9)

(ii) Explain preprocessor directives in detail. (7)

12. (a) (i) Write a C program to perform the following : Create a structure employee with variables eno, name, designation, basic pay and allowance. The data type of eno is integer, name and designation is character, basic pay and allowance are integers. Your program should accept the above details for an employee and display the same. (6)

(ii) Give an example for structures defined within another structure in C. Illustrate with the necessary declarations and programs. (4)

(iii) Write a function search to retrieve and display a particular employee with their details. (6)

Or

(b) Write a 'C' program to read two file contents and displays the mismatching words present in the two files. (16)

13. (a) Explain deletion a node from a linked list with suitable diagrams. Explain create, insert and delete operations in circular list. (16)

Or

(b) (i) What are the advantages of circular linked list? (6)

(ii) How a polynomial is represented using linked list? Explain with an example. (10)

14. (a) Write the necessary routines for postfix expression evaluation using stack ADT. Trace your algorithm with an example. (16)

Or

(b) What is a queue data structure? Illustrate with a diagram and explain the algorithm for inserting data into a queue and deleting data from a queue. (16)

15. (a) (i) Write the selection sort algorithm and apply the selection sort algorithm for the following data set : 44, 68, 191, 119, 37 and 83. (7)

(ii) Explain quick sort with an example. (9)

Or

(b) (i) Outline the steps to perform binary search on a sorted array of 'N' numbers. Write the algorithm. Trace your algorithm with an example. (9)

(ii) What is separate chaining? Write necessary routines for collision resolution using separate chaining. (7)

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Question Paper Code : 91391

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Second Semester

Computer Science and Engineering

CS 6202 – PROGRAMMING AND DATA STRUCTURES – I

(Common to :Information Technology)

(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. What are the uses of pointers ?
2. How are functions invoked in C ?
3. What is an union ?
4. Write commands to create, read and write a file.
5. What is a list ?
6. List the merits of linked list over arrays.
7. Convert the expression (A-B/C)*(D/E-F) into postfix expression.
8. List the real-time applications of queues.
9. Define hashing.
10. Compare linear and binary search.

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PART – B (5×16=80 Marks)

11. a) Discuss in detail about various control statements available in "C" with suitable examples. (16)

(OR)

b) i) What do you mean by "array" ? Explain in detail with examples. (8)

ii) Explain about passing pointers to functions in detail. (8)

12. a) Write a program in 'C' to open, read the contents of a file and to write it in another file. (16)

(OR)

b) i) What are the uses of structure data type ? Explain in detail with a sample program. (12)

ii) Compare structure and union. (4)

13. a) Explain singly linked list and doubly linked list in detail with example. (16)

(OR)

b) Give a representation for a polynomial using a singly linked lists. Write an algorithm to add two polynomials. (16)

14. a) Explain about insertion and deletion algorithm for a circular queue in detail. (16)

(OR)

b) Discuss the following :

i) Stack ADT

ii) Queue ADT. (8+8)

15. a) Write down the algorithm for shell sort and using it sort the sequence of numbers 41, 23, 74, 11, 94, 65, 57, 70, 81, 61. (16)

(OR)

b) Write down the algorithm for merge sort and using it sort the sequence of numbers 42, 23, 74, 11, 65, 57, 94, 36, 99, 81, 61. (16)

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