Part-I

Q1 Answer the following questions: (2 x 10)

a) What is a global variable and a local variable? Give an example.
b) Define a symbolic constant. Give an example. Why is it used?
c) What are *getchar ()* and *putchar ()* functions and why they are used?
d) List the different types of errors that occur during the execution of a C program.
e) Differentiate between postfix and prefix operators with an example.
f) Distinguish between compiler and interpreter.
g) Differentiate between *while* and *do-while* loops.
h) Distinguish between homogeneous and heterogeneous data structures.
i) Explain pointer to function with an example.
j) Difference between a binary tree and a binary search tree with an example.

Part-II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

a) Difference between Linear Search and Binary Search. Write the pseudocode to implement binary search. Search the value "14" from the following sequence of numbers:
2, 5, 10, 14, 15, 30, 38
b) What is dynamic memory allocation? Write and explain the different dynamic memory allocation functions in C.
c) Write a program to find the area of a rectangle using call-by-reference.
d) Write a program to find whether a number is PALINDROME or not.
e) Write a C function "*isprime(num)"* that accepts an integer argument and returns 1 if the argument is prime; a 0, otherwise. Write a C program that invokes this function to generate the prime numbers between a given ranges.
f) Explain what is an algorithm and what is a flow-chart? How are they used as a problemsolving tool? Give an example to justify your answer.
g) Write a C program to copy the contents from one string to another without using the string functions.
h) Write a program to read 20 unsorted numbers to an array and pass the address of this array to a function to sort the numbers in ascending order using bubble sort technique.
i) Explain array of pointers and pointer to array with an example from each.
j) Can a function return multiple values? Justify with an example.
k) Differentiate between "break" and "continue" statements with an example.
l) Construct the binary tree from the given sequence:
Pre-order: A B D E C F
In-Order: D B E A F C

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 a) Explain about array of structures and structure within a structure with an example. **(8+8)**
b) Write a C program to maintain a record of 10 players of Indian Cricket team. Print the scores of each player in 5 matches given the name of each player.
Q4 a) Explain the two-way selection (*if, if-else, nested if-else*) in C language. **(8+8)**
b) Write a C program to read a year as input and find whether it is a leap year or not
Q5 a) Explain what is a recursive function along with its properties. **(10+6)**
b) Write a C program to print the Fibonacci sequence of 10 numbers using recursion.
Q6 a) Differentiate between an array and a linked-list. **(10+6)**
b) Write an algorithm to create a single linked-list of 5 nodes. Insert the elements and display them