KATHMANDU UNIVERSITY
End Semester Examination
2013

Level : B. E./B.Sc./B. Tech.
Year : I
Time : 2 hrs 30 mins.

Course : COMP 103
Semester : I
F.M. : 40

SECTION "B"
[6Q×4=24 marks]

I. Attempt *Any SIX* Questions (**Question No. 4 is Compulsory**).

1. Describe different steps for the development of a C-Program.

2. With example, describe *any four* types of operator used in C-Programming.

3. What is the importance of loop structure? With example, describe do-while loop, while loop and for loop.

4. Write a program to check whether a given number is *Armstrong* or not. [Hint: XYZ is an Armstrong number because $X^3+Y^3+Z^3= XYZ$]

5. Define a string. With example, describe *any six* string manipulating functions.

6. Using pointer, write a program to calculate *Average* of user given number of array elements. Ensure that the *Average* function should return a floating point value.

7. Write a C program to *Swap* (interchange) value of two variables with the help of function and pointer.

SECTION "C"
[2Q×8=16 marks]

II. Attempt *Any TWO* Questions (**Question No. 8 is Compulsory**).

8. Write a C program that illustrates how an array of structures is passed to a function, and how a pointer to a particular structure is returned.

9. Differentiate pass by value with pass by reference. Write a program to illustrate three library functions related to dynamic memory allocation in C programming.

10. Briefly explain different types of storage class specifier that are used in C programming language. Write a C program to copy and compare structure variables.

KATHMANDU UNIVERSITY
End Semester Examination [C]
2014

Level : B. E./B.Sc./B. Tech.
Year : I
Time : 2 hrs. 30 mins.

Course : COMP 103
Semester : I
F.M : 40

SECTION "B"
[6 Q. × 4= 24 marks]

Attempt any SIX questions:

1. Summarize the rule for naming identifiers. Are uppercase letters equivalent to lowercase letters? Name the different classes of statement in C. Describe the composition of each.

2. Describe the output that will be generated by each of the following C program.
   a.
```
#include<stdio.h>
main( )
{
 int i, j, x=0;
 for(i=0;i<5;++i)
   for(j=0;j<i;++j){
    x+=(i+j-1);
    printf("%d",x);
   }
  printf("\nx=%d",x);
}
```
   b.
```
#include<stdio.h>
main( )
{
  int n=10;
   printf("%d",funct1(x));
}
int funct1(int n)
{
 if(n>0) return (n+funct1(n-1));
}
```
3. What is meant by branching? Suppose a 'break statement' is included within the innermost of several nested control statements. What happens when the 'break statement' is executed?

4. Write a loop that will generate every fourth integer, beginning with variable i=3 and containing for all integer that are less than 150. Calculate the sum of those integers that are divisible by 7.

5. Write a program to swap values of two variables using a function. Pass the argument to function by reference.
6. Write a program to read integers n1 and n2 and display all odd numbers between those two numbers.

7. What is the purpose of the keyword void? Where is this keyword used? Why might a return statement be included in a function that does not return any value?

SECTION "C"

[2 Q. × 8 = 16 marks]

Attempt any TWO questions

8. What are the keywords in C? What restrictions apply to their use? Compare the use of the switch statement with the use of nested if-else statements. What is function? Are functions required when writing a C program? State three advantages of the use of functions. Can the names of formal arguments within a function coincide with the names of other variables defined outside of the function? Explain.

9. In what way does an array differ from an ordinary variable? How are individual array elements identified? What advantages is there in defining an array size in term of a symbolic constant rather than a fixed integer quality? What value is automatically assigned to those array elements that are not explicitly initialized? Write a program that reads two matrices of order m x n and p x q respectively using a function read Matrix(). The program should contain a function process Matrix() that takes the matrices and multiply them. The result of multiplication must be display using a function show Matrix().

10. Write a program that defines a structure STUDENT containing name, symbol number, marks of six subjects, total mark and percentage as its members and reads the data for ten students. Your program should display the record in descending order according to the percentage obtain by the students.

KATHMANDU UNIVERSITY
End-Semester Examination
January/February 2015

Level	:	B. E./B. Sc./B. Tech.	Course	:	COMP 103
Year	:	I	Semester	:	I
Time	:	2 hrs. 30 mins.	F.M.	:	40

SECTION "B"
[6 Q × 4 = 24 marks]

Attempt Any SIX Questions (Question No. 4 is Compulsory).

1. Define structured programming language. Describe general structure of a C program.
2. What do you mean by data type? With example, describe three classes of data types.
3. Define decision structure. Write a program to illustrate switch-case, continue and break statements.
4. Write a C program to check whether a number is *Strong Number* or not. [Hint: XYZ is a strong number because X! + Y! + Z! = XYZ]
5. Write a program that reads twelve numbers entered by the user and prints if any of them match.
6. With example, differentiate pass by value with pass by reference.
7. Define dynamic memory allocation and briefly explain different dynamic memory allocation functions.

SECTION "C"
[2 Q × 8 = 16 marks]

Attempt Any TWO Questions (Question No. 9 is Compulsory).

8. Using function, write a program to multiply two matrices. Display the resultant matrix.
9. Write a C program that illustrates how an array of structures is passed to a function, and how a pointer to a particular structure is returned.
10. Explain storage class specifiers. Write a program to enter record of 'n' number of students according to structure given below and arrange the records in ascending order based upon their name.

```
struct student{
int Roll_Num;
char Name[20];
char Dept[20];
}
```

KATHMANDU UNIVERSITY
End Semester Examination
August/September, 2016

Level	: B.Sc./B.Pharm./B.Tech.	Course	: COMP 102
Year	: I	Semester	: II
Time	: 2 hrs. 30 mins.	F. M.	: 40

SECTION "B"

[6 Q. × 4 = 24 marks]

Attempt *ANY SIX* questions:

1. Explain the following loop control statement in C with example:
   (a) break statement
   (b) continue statement
   (c) switch statement

2. Distinguish between #include and #define.

3. What is character array? How is it different from other data type of arrays?

4. Write a C program to find the smallest value among the four numbers.

5. Define the different types of statement used in C?

6. Define 'for' loop. Write a C program to find the sum and average of the given numbers using 'for' loop.

7. Explain about the difference between prinf( ) and scanf( ) with an examples. Write a program in C to find the given principal, rate of interest and number of years.

SECTION "C"

[2 Q. × 8 = 16 marks]

Attempt following question.

8. What is multidimensional array? How is it different from a one dimensional array? Write a C program to read the elements of a given two matrices of n x n order and to perform the matrix multiplication.

9. Distinguish a structure data type with other data type variables. Develop a program in C to read the following information from the keyboard.

   employees name
   employees code
   designation
   years of expenditure
   age

KATHMANDU UNIVERSITY
End Semester Examination
February/March 2016

Level : B. E./B. Sc./B. Tech.
Year : I
Time : 2 hrs. 30 mins.

14 MAR 2016

Course : COMP 103
Semester : I
F. M. : 40

SECTION "B"
[6 Q. × 4 = 24 marks]

Attempt ANY SIX questions of the following.

1. Describe the usefulness of switch statement. Write a program that will read the value of x and evaluate the following functions. Use nested if statement. [2+2]

$$y = \begin{cases} 1 & for \quad x > 0 \\ 0 & for \quad x = 0 \\ -1 & for \quad x < 0 \end{cases}$$

2. What are relational operators? Provide a C snippet that demonstrates use of != (not-equal-to) relational operator. How does %= operator differ with != operator? [1+2+1]

3. Describe the syntax of **do-while** statement. The time period of a pendulum can be calculated using following equation.

$$T = 2\pi\sqrt{\frac{l}{g}}$$

where l is length of pendulum, g is acceleration of gravity (= 9.8).
Write a program to calculate the time period of a simple pendulum for different values of l starting from 1 to 10 in steps of 1. [1+3]

4. Consider the weekly salary of a salesman who is selling some domestic products. If x is the number of products sold in a week, his weekly salary is given by

$$salary = \begin{cases} 4.x - 100 & for \quad x < 40 \\ 300 & for \quad x = 40 \\ 4.5x + 150 & for \quad x > 40 \end{cases}$$

Write a function ***get_salary*** that takes x as an argument and returns a salary. Also write a complete program to make use of this function.

5. What is an array? How does passing a variable to function differ with passing an array to function? [1+3]

6. What are static storage classes? Write a complete C program that shows the use of static variable. [1+3]

7. There are mainly two library functions that dynamically allocate memory. They are `malloc()` and `calloc()` functions. In what ways these two functions are different? [4]

SECTION "C"

[2 Q. × 8 = 16 marks]

Attempt *ANY TWO* questions of the following.

8. Given a square matrix A of size 10 x 10, write a program that identifies whether the given matrix is a diagonal matrix or not. Diagonal matrix is a matrix in which all non-diagonal elements are zero. [8]

9. Create a structure called "Employee" with attributes **name**, **salary**, **year** and **taxable**; name variable stores a name of an employee, year stores the year of joining a company, salary stores an annual income of that employee and taxable stores either 0 or 1. 0 represents that his/her salary is not taxable and 1 represents that his salary is taxable. In main program, create an array of 5 employees. Initialize the array. In addition to that your program should calculate the total tax amount collected from all employees. Assume that the tax rate is 15%. [1 + 1 + 1 + 5]

10. Consider that you are a student of grade 10 studying 5 subjects. The scores of 4 courses you obtained are arranged in an array `Score[4] = {86, 45, 51, 61}`. The highest mark you can score in any subject is 100 and the minimum score to pass any subject is 40. You have to write a program that calculates a number that you need to score in 5th subject to get certain percentage. Following test cases show how your program should work. [8]

Test Case #1
Enter the percentage you want to score: **78**
Impossible to score.
Test Case #2
Enter the percentage you want to score: **60**
The mark you have to score in 5th subject is: 57
Test Case #3
Enter the percentage you want to score: **45**
The minimum percentage you can score is: 56.6

KATHMANDU UNIVERSITY
End Semester Examination [C]
June/July, 2016

Level : B. E./B. Sc./B. Tech.
Year : I
Time : 2 hrs. 30 mins.

30 JUN 2016

Course : COMP 103
Semester : I
F. M. : 40

SECTION "B"
[6Q × 4 = 24 marks]

Attempt *ANY SIX* questions (Question No. 4 is Compulsory).

1. Explain the four steps of development of a C-program.
2. Write a program in C in order to illustrate *switch-case* statement.
3. What do you mean by *control structure*? With example, explain the two types of *control of repetition.*
4. Using function, write a program in order to demonstrate *recursion.*
5. With example, differentiate *pass by value* with *pass by reference*.
6. With example, explain *nested loop* and *nested structure*.
7. Write a program to calculate *Average* of user given number of array elements. Ensure that the *Average* function should return a floating point value.

SECTION "C"
[2Q × 8 =16 marks]

Attempt *ANY TWO* questions (Question No. 9 is Compulsory).

8. Write a C program that finds the *transpose* of given 3 × 3 matrix. Please display both the matrix and transpose of it using functions.
9. With example define *typedef* and *union*. Using structure and function, write a C-program in order to sort the information of five (5) students by their names.
10. Compare and contrast an *array* with a *structure*. Define storage class. Explain different types of storage class.

KATHMANDU UNIVERSITY
End Semester Examination
August/September, 2017

Level: B.Sc./B.Pharm./B. Tech. | Course: COMP 102
Year: I | Semester: II
Time: 2 hrs. 30 minutes | F.M.: 40

SECTION "B"
[6 Q. × 4 = 24]

Attempt *ANY SIX* questions.

1. What is a variable? What sort of variable names are acceptable in C programming language? How does it differ with Keyword? [1+2 + 1]

2. What do you mean by Looping? Write a program to print all even numbers between 101 to 201 except those divisible by 14. [1 + 3]

3. Describe a static variable in terms of it's scope and lifetime. Write a simple C program to demonstrate the use of static variable. [2+2]

4. What do you mean by tertiary operator? Write a simple C program that makes use of tertiary operator. [1+3]

5. Describe the syntax of **else if ladder**. How is different with **switch** statement. [2+2]

6. Write a function called **is_divisible** that takes two positive integer as arguments. Assuming that the first argument (arg1) is less than second argument (arg2), your function shall return true (1) if arg2 is exactly divisible by arg1 otherwise false (0). For example, when calling is_divisible (3, 7) shall return 0 since 7 is not divisible by 3. You do need to write a main function.

7. What is a pointer variable? How is pass by reference advantageous than pass by value? [1+3]

SECTION "C"
[2 Q. × 8 = 16]

Attempt *ANY TWO* questions.

8. Differentiate between Array and Pointer? In what ways are they similar? Write a complete C program that demonstrates the addition of two dimensional array. [2+2+4]

9. What are the advantages of having structure in C programming language?
   a. Create a structure called "Point" with attributes **x_axis**, and **y_axis**; x_axis variable stores the x value of a point, and y_axis stores the y value of a point.
   b. In main program, create an array of 10 points. Write a code to input data of 10 points from user.
   c. In addition to that, your program should check whether user has entered (0,0) point. [2+2+2+2]

10. Write a complete C program to demonstrate the use of library functions fopen(), fclose(), fgetc(), and fputc(). [2+2+2+2]

KATHMANDU UNIVERSITY
End Semester Examination
March/April 2017

Level : B.E./B.Sc./B.Tech.
Year : I
Time : 2 hrs. 30 mins.

Course : COMP 103
Semester: I
F.M. : 40

SECTION "B"
[6 Q. × 4 = 24]

Attempt any ***SIX*** questions.

1. What do you mean by Data Types? Explain the difference between 'a' and "a" when used as constants in C. Describe the memory representation of both values. [1+1+2]

2. What is the difference between a local and global variable in C? Write a program that illustrates the use of static variable. [1+3]

3. What do you mean by pass by value? Illustrate with an example, how passing an array to function is different than passing a variable to function. [1+3]

4. Triangle Inequality Theorem simply states that the sum of two sides of a **triangle** must be greater than the third side. If this is true for all three combinations, then you will have a **valid** triangle. You'll have to go through these combinations one by one to make sure that the triangle is possible. Write a program that takes three sides of a triangle and prints whether it is valid triangle or not.

5. Two keywords that are frequently used in looping are **break** and **continue**. Write a C program that illustrates the use of these keywords.

6. Write a function called **how_many_primes_between** that takes two positive numbers as arguments. Assuming that the first argument (arg1) is less than second argument (arg2), your function shall return number of prime numbers in between arg1 and arg2. For example, when calling how_many_primes_between (3, 7) shall return 1 since there is one prime number 5 in between 3 and 7. You do not need to write a main function.

7. What are logical operators? Describe each one. Provide a C snippet that demonstrates use of ! (not-operator). [1+1.5+1.5]

SECTION "C"
[2 Q.×8=16]

Attempt any ***TWO*** questions.

8. Write a program that first takes 4 x 4 square matrix as an input from user and prints the sum of each row.
Following is the output that your program should print.

1	2	3	4	Sum = 10
5	6	7	8	Sum = 26
9	10	11	12	Sum = 42
13	14	15	16	Sum = 58

9. Create a structure called "Student" with attributes **name**, **age** and **birth_place**; name variable stores the name of a student, age stores the age of that student, and birth_place stores the name of the place where that student was born.
In main program, create an array of 10 students. Write a code to input data of 10 students from user.
In addition to that, your program should check whether any two or more students are neighbors or not. Two students are called neighbor if they have same birth place. [1+1+1+ 5]

10. Differentiate between **malloc** and **realloc** functions. Write a complete C program that illustrates the use of those functions including **free** function. [3+5]

KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2018

MAR 1 4 2018

Level : B.E./B. Sc./B. Tech.
Year : I
Time : 2 hrs. 30 mins.

Course : COMP 103
Semester : I
F. M. : 40

SECTION "B"
[6 Q × 4 = 24 marks]

Attempt *Any SIX* questions (Question No. 4 is Compulsory).

1. Discuss on the characteristics of C programming language. Describe general programming rules of it.

2. What do you mean by an expression? With example, describe different types of operators used in C programming language.

3. Define switch-case in C programming. Considering character constants as testing values, write a C program in order to illustrate switch-case, continue and break statements.

4. Write a C program to check whether a user given number is *Armstrong* or *not* using function. [Hint: XYZ is an Armstrong number because $X^3 + Y^3 + Z^3 = XYZ$]

5. Write a program that reads user input ten (10) numbers and displays if any of them is matched (multiple occurrences of a number).

6. Mention the significances of functions. Illustrate different features of a function in C programming.

7. What do you mean by storage class? By example of C program, differentiate static storage class with automatic storage class.

SECTION "C"
[2 Q × 8 = 16 marks]

Attempt *ANY TWO* questions (Question No. 9 is Compulsory).

8. Using function, write a program to calculate transpose of user given an M×N matrix. Display the resultant matrix after adding the integer value 5 (five) to each element of it.

9. How structure is different from union? Assume that a structure has five (5) members as **Roll_Num, Name, Dept, DOB,** and **Marks**. Also, **DOB** is composed of *Day, Month*, and *Year* members. Using nested structure, write a C program to enter records of 'n' number of students and display the records in descending order based upon their name.

10. Define dynamic memory allocation. Briefly explain the functions used in it. Write a C program to calculate average marks of user given 'n' number of students in COMP 103. Use *malloc()* function in your program.

KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

04 JUN 2019

Level : B.E./B.Sc./B.Tech.
Year : I
Time : 2 hrs. 30 mins.

Course : COMP 103
Semester: I
F. M. : 40

SECTION "B"

[6 Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. How can an array be declared in C-programming? Briefly explain datatype, identifier and variable with proper variable statement. [1+3]

2. Write a C program to count total number of prime numbers stored in an array using function. Explain the program in comment section.

3. What is associativity of an operator? Discuss in brief about a type of operator which has right to left associativity. [1.5+2.5]

4. Using if…else ladder, write a program to compute and output the number of digits in any user input number. Consider the following cases:
   If number is between 0 and 9: 1 digit number
   If number is between 10 and 99: 2 digit number
   If number is between 100 and 999: 3 digit number
   If number is above 999: above 3 digit number
   For any other number: Invalid input

5. Write a program to read a binary number and convert it into decimal one.
   Example: $111=1*2^2+1*2^1+1*2^0=1*4+1*2+1=7$

6. Write in brief about the advantages of modularization in C-programming.

7. Write short notes on: [2+2=4]
   a. Unformatted I/O functions b. Pointer to structure

SECTION "C"

[2 Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Differentiate between dynamic memory allocation and automatic memory allocation in an array. Briefly explain DMA functions with proper syntax in C programming. [3+5]

9. How a recursion consumes more memory and takes more execution time than its iterative counterpart? Explain it with an appropriate example. Write a recursive program to find the sum of n natural numbers, where n is a user input number. [4+4]

10. Define a structure "Distance" with two entities "km" and "m" (both of type int) and write a program to take five distance values as input and display them in ascending order. Write a function named *void swapDistance(Distance *a,Distance *b)* to swap two distance values. [5+3]

KATHMANDU UNIVERSITY
End Semester Examination [C]
November, 2022

Level : B.E./B.Sc./B.Tech.
Year : I
Time : 2 hrs. 30 mins.

08 NOV 2022

Course : COMP 102
Semester : I
F.M. : 40

SECTION "B"
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. How do getchar() and putchar() functions differ from scanf() and printf() functions respectively? Explain with examples. [2+2]

2. Compare if-else statement with conditional operator (? :) with syntax. [2+2]

3. Write a program using pointer to read an array of integers and print its elements in reverse orders. [4]

4. How can the header files be accessed in the C language? Explain its purpose with suitable examples. [2+2]

5. Write a C program to print the numbers **that do not appear** in Fibonacci series. The number of such elements to be printed should be given by the user. [4]

6. How does a C program behave when the name of the variable declared inside the function resembles the function name itself? Discuss the scope of the global and local variables with proper examples. [2+2]

7. Write a C program to convert temperature from centigrade to Fahrenheit. The formula for converting temperature from Celsius to Fahrenheit scale is 9C=5F-160, where C represents temperature in Celsius and F represents temperature in Fahrenheit. Describe each term used in the program. [2+2]

SECTION "C"
[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Write a C program that perform **Matrix Multiplication**. The program should:
   a. **Read** the elements of a given two matrices of n x m order provided by the user on the run time. [2]
   b. The program should **check** whether multiplication is possible or not in the main function; if not then display proper message. [1]
   c. The entire array elements should be passed to the **user defined function**. [2]
   d. **Matrix Multiplication** should be done on the user defined function. [2]
   e. **Display** the result. [1]

9. Explain with example how a library function differs from a normal user-defined function. Write a C program to **generate the prime numbers** from 1 to 100 and pass those numbers to the user-defined function **primeAverage** which calculates the average of those prime numbers and **displays** the result. [4+2+2]

10. Describe the properties of four different **built in data types** supported by C programming language. With proper syntax and example, write a mechanism to show how a **user defined data type** be created and used. [4+4]

KATHMANDU UNIVERSITY
End Semester Examination
July, 2022

JUL 10 2022

Level : B.E./B.Sc./B.Tech.
Year : I
Time : 2 hrs. 30 mins.

Course : COMP 102
Semester: I
F.M. : 40

SECTION "B"
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. Precedence and associativity are import concepts in expression evaluation. Illustrate its importance with an example. What is left to right and right to left associativity? [2+2]

2. Compare and contrast for loop with do-while loop. Write a program that will display your name if an integer value is divisible by 7 but not by 10. [2+2]

3. Write a C program that calculates the area of a triangle using Heron's formula as

$$area\ of\ a\ triangle = \sqrt{s(s-a)(s-b)(s-c)},$$

Where s is a semi perimeter of a triangle and is calculated as s = (a + b + c) / 2 where a, b, c are three sides of a triangle. Your program should read a, b, and c in the main function and pass them into a user-defined function that calculates the area of a triangle.

4. Illustrate the use of auto and static keywords with the best possible use-case scenario. [2+2]

5. Define the term structure. Write a program that stores 5 values in a structure. [1+3]

```
struct record
{
int emp_id;
char name[20];
float salary;
};
```

6. What is recursion (recursive function)? Explain recursive process and illustrate the working mechanism with reference to sum of natural numbers. [1+3]

7. Write a C program to input a number and find the largest digit in it. [For example if number is 5273, then your program should return 7 as the largest digit]. The number should be read in main and it should be passed into a user-defined function for necessary processing.

SECTION "C"
[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Distinguish between pass by reference and pass by value. Write a program that reads 10 numbers, stores them in a dynamic array, and then resets all values to zero. Deallocate the memory at the end of program. [2+2+1+1+1+1]

9. You are required to determine the standard deviation of N different decimal values. Write a program, using one-dimensional array, which satisfies the given requirements. [1+2+2+2+1]

a. Fix size of N using symbolic constant.
b. Read N elements in a main function.
c. Calculate the average of N numbers within the main function.
d. Pass the array elements, N, and average in a function that calculates standard deviation.
e. Return the value of standard deviation in main function and display it.

The formula for standard deviation is:

$$\sigma = \sqrt{\frac{\sum(x_i - \mu)^2}{N}}$$

where $\sum$ means "sum of", x is a value in the data set, μ is the mean of the data set, and N is the number of data points in the data set.

10. Write short notes on: [4 × 2 = 8]

a. Identifier and variable
b. Relational and conditional operators
c. Actual and formal parameters
d. Break and continue

KATHMANDU UNIVERSITY
End Semester Examination
June/July, 2023

29 JUN 2023

Level : B.E./B.Sc./B.Tech.
Year : I
Time : 2 hrs. 30 mins.

Course : COMP 102
Semester: I
F.M. : 40

SECTION "B"
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. What are the rules for writing variable names in C? Write a program to find the area and circumference of a circle. Constant value PI = 3.14. [1+3=4]

2. What are operators? Explain unary operator ++ (both as prefix and postfix) with a suitable example. [1+3=4]

3. Write an interactive C program to input marks of three subjects (Mathematics, English, Physics) for a student and find the total, percentage and division of the student (make necessary assumptions). [1+1+1+1=4]

4. Write a C program to generate the following pattern.

```
1   2
1   2   3
1   2   3   4
1   2   3   4   5
```

5. List the storage classes available in C. Describe each of them in terms of default initial value, storage location, scope and life of variables. [1+3=4]

6. In what ways does an array variable differ from an ordinary variable? In what ways arrays are similar to pointers, explain. [2+2= 4]

7. Write short notes on (*ANY TWO*):
   a. Difference between while and do while
   b. break, continue and go to statement
   c. Recursion

SECTION "C"
[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. a. What is the purpose of functions in a program? Differentiate between pass by value and pass by reference with suitable examples. [1+3=4]

   b. What are arguments? Explain their importance with examples. [2]

   c. What are return types? Explain their importance with examples. [2]

9. a. Discuss the menu driven program with an example. [2]

b. Write a modular program for the following: [2+2+2=6]
   i) Find the factorial of any integer entered through the keyboard.
   ii) Find the square of a number entered through the keyboard
   iii) A function power(a,b) to calculate the value of a raised to b

10. Write a program that defines a structure called student with suitable attributes (name, roll_no, email, enrolled_year etc.) and read the data for at least five students. The program should access the structure member using structure pointer and display the records in ascending order according to the enrolled_year of the student.

KATHMANDU UNIVERSITY
End Semester Examination
September 2024

Level : B.E./B.Sc.
Year : I
Time : 2 hrs. 30 mins.

09 SEP 2024

Course : COMP 102
Semester : I
F. M. : 40

SECTION "B"
[6Q. × 4 = 40 marks]

Attempt *ANY SIX* questions.

1. What is identifier? What are the ways to give value to variable? Define constant and write its type. [1+2+1]

2. List different operators with their corresponding associativity in C. What are relational and assignment operators in C? Explain with example. [2+2]

3. Explain about basic structure of C program with example. Write the syntax and example of puts(), scanf(), printf() and putchar() in C. [2+2]

4. Briefly describe different types of functions available in C. Write a program in C to input a number and calculate the sum of individual digits present on that number using recursion. [2+2]

5. Write a C program to input a list of values from user into an array. Pass the list to a function which sorts the values in ascending order. Display the sorted list from main program.[4]

6. Differentiate between **malloc()** and **calloc()** with suitable example. [4]

7. Explain any two storage class used in C. Write a C program to input a 2×2 matrix and display the transpose matrix of that matrix. [2+2]

SECTION "C"
[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Write a menu driven program in C which has following options: [3+2+2+1]
   a. To check whether a number is strong or not.(e.g. 145, 1!+4!+5!=145)
   b. To check whether a number is prime or composite.
   c. Display the middle number among three numbers.
   d. Exit

9. What is **typedef**? Write a program to read structure "collage" having name, estDate and location where estDate is an another structure having day, month and year as members. Display the records of any collages using function. (Number of collages is input by user). [1+7]

10.
   a. Write down advantages of pointer. Write a program using pointer to swap the values of two variables where the swapping variables by separate function. [1+3]
   b. Explain about break and continue statement with example. [4]