

**Bihar Engineering University, Patna**  
**B.Tech 1<sup>st</sup> Semester Exam-2022**

Course: B.Tech.

Code: 100104

Subject: Programming for Problem Solving

Time: 03 Hours

Full Marks: 70

**Instructions:-**

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory

**Q.1 Choose the correct answer of the following: (any seven)**

[2 x 7 = 14]

- (a) What does the following declaration mean?

`int *ptr [5];`

- (i) ptr is an array of pointers to 5 integers
- ~~(ii)~~ ptr is an array of 5 integers
- (iii) ptr is a pointer to an array of 5 integers
- (iv) ptr is a pointer to array

- (b) The function `malloc()` is declared in which header file.

- (i) `stdio.h`      (ii) `stdlib.h`      (iii) `conio.h`      (iv) `iostream.h`

- (c) `#include<stdio.h>`

`int main( )`

```
{  
    char ch = 'Z'  
    printf ("%d\n", ch);  
    return 0;  
}
```

- (i) 65      (ii) 90      (iii) 97      (iv) 122

- (d) How is an array initialized in C language?

~~(i)~~ `int a[3] = {1, 2, 3};`

(ii) `int a= {1, 2, 3};`

(iii) `int a [ ] = new int[3];`

(iv) `int a(3) = [1, 2, 3];`

- (e) What is the return type of the `fopen()` function in C?

- (i) Pointer to a FILE object.
- (ii) Pointer to an integer.
- (iii) An integer.
- (iv) None of the above.

- (f) What will be the output of the following C Code?

```
#include<stdio.h>  
int main()  
{  
    int x=4, y, z;  
    y= --x;  
    z= x--;  
    printf("%d%d%d", x, y, z);  
}
```

- (i) 3 2 3
- (ii) 2 2 3
- (iii) 3 2 2
- (iv) 2 3 3

- (g) The keyword used to transfer control from a function back to the calling function is.

- (i) `switch`      (ii) `return`      (iii) `continue`      (iv) `go to`

(h) `#include <stdio.h>`  
`int main( )`  
`{`  
`float a = 5, b = 2;`  
`int c, d;`  
`c = a/b;`  
`d = c/2;`  
`printf("%d", d);`  
`return 0;`  
`}`

(i) 1      (ii) 0      (iii) 1.5      (iv) 1.25

(i) In C, if you pass an array as an argument to a function, what actually gets passed?

- (i) First element of the array
- (ii) Value of elements of the array
- (iii) Base address of the array
- (iv) Address of the last element of array

(j) How is the 3<sup>rd</sup> element in an array accessed based on pointer notation

- (i) `*a+3`      (ii) `*(a+3)`      (iii) `*(a+3)`      (iv) `&(a+3)`

Q.2 (a) Explain entry controlled loop and exit controlled loop with flow charts and examples. [7]

(b) Write a C program to reverse a given multi-digit number. [7]

Q.3 (a) Explain **break** and **continue** keywords with suitable examples in context of managing loops. [7]

(b) What is storage classes in C. Write features (storage, default value, scope, life) of variables defined under each storage class. [7]

Q.4 (a) Write a C function for Bubble sort. Analyse the time complexity of Bubble sort for each standard cases. [7]

(b) Differentiate between formal argument and actual argument with an example. [7]

Q.5 (a) What is recursion? Write a recursive C program to generate n<sup>th</sup> term of the Fibonacci series. [7]

(b) How string is declared and initialized? Explain any four predefined string manipulation functions with examples. <https://www.akubihar.com> [7]

Q.6 (a) Write a C program to find result matrix after multiplying two given matrices using 2-D arrays. [7]

(b) Write a program to copy contents of one file to another. While doing so replace all lowercase characters to their equivalent uppercase characters. [7]

Q.7 (a) Write the difference between structure and union. Compare them with the help of an example. [7]

(b) Write a program to copy the contents of one array into another in reverse order. [7]

Q.8 (a) Differentiate between call-by-value and call-by-reference with suitable examples. [7]

(b) Discuss conditional operator? Write a C program to find largest of three numbers using conditional operator? [7]

Q.9 (a) Write a C program that converts a string like "124" to an integer 124. [7]

(b) Write a C program using the nesting of loops to print the following pattern: [7]

```

      1
     2 3
    4 5 6
   7 8 9 10
  
```