

(Please write your Exam Roll No.)

Exam Roll No

Bharti Vidyapeeth's
Institute of Computer Applications and Management
A-4, Paschim Vihar, New Delhi-63

FIRST SEMESTER [MCA] Internal Examination, September 2018

Paper Code: MCA – 103

Subject: Programming in C

Time: 2 Hours

Maximum Marks: 45

Note: Attempt THREE questions in all. Question No. 1 is compulsory and attempt one question from each unit.

1. Answer all the following questions briefly:- 1.5 x 10 = 15
- (a) Check if a number input by the user is a perfect number or not through an exit controlled loop? 1.5
- (b) With an example explain the concept of variable size arrays in C? 1.5
- (c) What is the difference among the following three programs? 1.5
- (a)

```
#include <stdio.h>
struct point { double x; double y; };
int main(void) { struct point test;
test.x = .25; test.y = .75;
printf("[%f %f]\n", test.x, test.y); return 0; }
```
- (b)

```
#include <stdio.h>
typedef struct { double x; double y; } Point;
int main(void) { Point test; test.x = .25; test.y = .75;
printf("[%f %f]\n", test.x, test.y); return 0; }
```
- (c)

```
#include <stdio.h>
typedef struct { double x; double y; } Point;
int main(void) { Point test = {.25, .75};
printf("[%f %f]\n", test.x, test.y); return 0; }
```
- (d) Demonstrate the relationship between arrays and pointers through example code? 1.5
- (e) With an example explain how const shall be used? 1.5
- (f) Explain the output of the following code: 1.5
- ```
#include <stdio.h>
int main()
{int a = 5, *b, c; b = &a;
printf("%d", a * *b * a + *b); return (0);}
```
- (g) Explain with an example how void pointers can aid pointer conversions? 1.5
- (h) Consider the following statements: 1.5
- ```
int *p,i,k; i = 42;k = i; p = &i;
```
- After these statements, which of the following statements will change the value of i to 75?
- A. k = 75;
B. *k = 75;
C. p = 75;
D. *p = 75;
E. Two or more of the answers will change i to 75.
- (i) With an appropriate example explain the various tokens in C? 1.5
- (j) Assume the definitions and initializations: 1.5
- ```
char c = 'T', d = 'S';
char *p1 = &c; char *p2 = &d; char *p3;
```
- Assume further that the address of c is 6940, the address of d is 9772, and the address of e is 2224. What will be printed when the following statements are executed sequentially?
- ```
p3 = &d;
printf("*p3 = %c\n",*p3); // (1)
```

```

p3 = p1;
printf("p3 = %c\n", *p3); // (2)
*p1 = *p2;
Printf("p1 = %c ", *p1); // (3)

```

UNIT - I

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|----|-----|--|---|
| 2. | (a) | Write a C Program to read an input string from the user. Write user-defined functions void maxmin(char[]) to find the smallest and the largest word in the string. | 5 |
| | (b) | What are the advantages and disadvantages of Recursion? Write a C Program to search for a given element in an array of integers using binary search. The binary search function should be implemented using recursion. | 5 |
| | (c) | Explain all the components of print format specification in a printf() statement. | 5 |
| 3. | (a) | Write a C language program to read an input string from the user. Write a function void split(char[]) to split the input string by space into words. | 5 |
| | (b) | Which problems should be solved through recursion? Write a C Program to read a decimal number from the user. Write a function to convert this decimal number to its binary equivalent using recursion. | 5 |
| | (c) | Explain the different storage classes available to variables in a C program | 5 |

UNIT - II

- | | | | |
|----|-----|---|---|
| 4. | (a) | Write a program that reads in a list of points (given by their x and y coordinates) and determines the pair that is the farthest apart. Hint: store them in an array and use the POINTdist() function. | 7 |
| | (b) | With an example explain how command line arguments are handled in a C program. | 3 |
| | (c) | Write a program to count and display the total number of vowels and consonants in a string using pointers. | 5 |
| 5. | (a) | Define two structures Rectangle and Oval. Use these to define a union shape. Write a function CalculateArea() that takes a parameter of type Shape and returns area of appropriate Shape. | 5 |
| | (b) | Write a program in C to arrange a string in lexicographical order. | 5 |
| | (c) | Write a program that calls a function search to search for a name in a given array of names. The array of names and name to be searched should be passed as parameters to the search () function. Ask the user to input the name to be searched in the array. | 5 |