



MAJOR EXAMINATION-2023

Course Code: CS/IT-101

Course Name: Principles of Computer Programming

Program & Sem: B.Tech (IMT/IMG/CSE/MSC/EEE), 1st Semester

Date: 03-12-2023 (Sun)

Max Marks: 50

Time: 3 Hrs

Instructions:

- (i) Read the all questions carefully and answer accordingly.
- (ii) This Question paper contains questions.

Part A

Answer all the Questions.

Each question carries one marks.

(15 Questions x 1 Mark = 15 Marks)

Q1. Consider the following C declaration:

```
struct {  
    short s[5];  
    union {  
        float y;  
        long z;  
    } u;  
} t;
```

Assume that objects of the type short, float and long occupy 2 bytes, 4 bytes and 8 bytes, respectively. The memory requirement for variable t, ignoring alignment considerations, is:

- (a) 22 bytes (b) 14 bytes (c) 18 bytes (d) 10 bytes

Q2. A typical repetition control structure comprises which of the following part

- (a) Initialization of condition variable instruction (b) Execution Block (c) Test Condition and Counter update (d) All of these

Q3. In C, static storage class cannot be used with:

- (a) Function Parameter (b) Global Variable (c) Function name (d) Local Variables

Q4. Which of the following operators can be applied on structure variables?

- (a) Equality (==) (b) Assignment (=) (c) Both a and b (d) None of the above

Q5. An array x[5][20] has been declared. What will be the output of the following statement:

```
printf("%d", sizeof(x));
```

- (a) 100 (b) 200 (c) 400 (d) 800

Q6. An array N[3]={1, 2, 3}; has been declared and initialized in a C program. What will be the output of the following statement:

`printf("%d",N[3]);`

- (a) 3 (b) 2 (c) 4 (d) Garbage Value

Q7. The process of creating a fixed-sized array by allocating memory space at compile time is called

- (a) Static Memory Allocation (b) Dynamic Memory Allocation (c) Run Time Allocation
(d) None of the Above

Q8. Which of the following values can be returned by the `strcmp()` function?

- (a) Positive value (b) Negative value (c) Zero (d) All of the Above

Q9. A character array `str[]` stores the string "NEW". What will be the return value of statement `strlen(str)` function?

- (a) 3 (b) 4 (c) 0 (d) None of these

Q10. It is required to store the name of five students. Which of the following array declaration statements can be used for this.

- (a) `char student [4][30];` (b) `char student [30][4];` (c) `char student [5][30];`
(d) `char student [30][5];`

Q11. Which constant values can be assigned to a pointer variable?

- (a) 0 (b) NULL (c) Both a and b (d) None

Q12. Which of the following is a valid indirection notation for a pointer.

- (a) `*ptr` (b) `**ptr` (c) `***ptr` (d) All of the above

Q13. Which of the following operations is allowed to be performed on a pointer variable

- (a) `ptr+1` (b) `ptr-1` (c) `ptr++` and `ptr--` (d) All of the above

Q14. Which of the following function is used to write an integer to a file

- (a) `fprintf()` (b) `putw()` (c) `putc()` (d) `puts()`

Q15. In C, parameters are always.

- (a) Passed by value (b) Passed by reference
pointers are passed by reference (c) Non-pointer variables are passed by value and
(d) Passed by value result

Part B

Answer all the Questions.

Each question carries 2 marks.

(10 Questions x 2 marks = 20 Marks)

Q16. What will be the output of the following program? Explain if there is no output, explain the reason for the same.

a.

```
#include<stdio.h>
void func(int n, int sum)
{
    int k = 0, j = 0;
    if (n == 0) return;
    k=n%10;
    j=n/10;
```

b.

```
#include<stdio.h>
#include<string.h>
int main()
int main()
{
    char p[20];
    char s[] = "string";
```

```

sum=sum+k;
func (j, sum);
printf ("%d", k);
}
int main ()
{
int a = 2048, sum = 0;
func (a, sum);
printf ("%d ", sum);
}

```

c. `#include <stdio.h>`

```

int main()
{int m,n,p;
for(m=0;m<3;m++)
for(n=0;n<3;n++)
for(p=0;p<3;p++)
if(m+n+p==2)
goto print;
print:
printf("%d,%d,%d",m,n,p);
return 0;
}

```

e. `#include <stdio.h>`

```

int main()
{
unsigned int i=65000;
while(i++!=0);
printf("%d",i);
return 0;
}

```

g. `int f(int x, int *py, int **ppz)`

```

{
int y, z;
**ppz += 1;
z = **ppz;
*py += 2;
y = *py;
x += 3;
return x + y + z;
}
void main()
{
int c, *b, **a;
c = 4;
b = &c;
a = &b;
printf( "%d", f(c,b,a));
}

```

```

int length=strlen(s);
int i;
for(i=0;i<length;i++)
p[i]=s[length-i];
printf("%s",p);
return 0;
}

```

d. `#include<stdio.h>`

```

int main()
{char str1[]="Week-7-Assignment";
char str2[]={ 'W', 'e', 'e', 'k', '-', '7', 'A',
's', 's', 'i', 'g', 'n', 'm', 'e', 'n', 't' };
int n1=sizeof(str1)/sizeof(str1[0]);
int n2=sizeof(str2)/sizeof(str2[0]);
printf("n1=%d,n2=%d",n1,n2);
return 0;
}

```

f. `#include <stdio.h>`

```

int f(char *p);
int main()
{char str[ ] = "ANSI";
printf("%d", f(str));
}
int f(char *p)
{char *q = p;

while (*++p)
;
return (p-q);
}

```

h. `#include<stdio.h>`

```

int main()
{
int a=1;
int b=1;
int c=a||-b;
int d=a--&&-b;
printf("a=%d, b=%d, c=%d, d=%d", a
b, c, d);
return 0;
}

```

- getchar();
}
i. Number of times printf() statement is executed

```
#include<stdio.h>
int main()
{
    int i, j, k=0;
    j=2 * 3 / 4 + 2.0 / 5 + 8 / 5;
    k -= -j;
    for(i=0; i<5; i++)
    {
        switch (i+k)
        {
            case 1:
            case 2: printf("\n%d", i+k);
            case 3: printf("\n%d", i+k);
            default: printf("\n%d", i+k);
        }
    }
    return 0;
}
```

j.

```
#include<stdio.h>
int *A, stkTop;
int stkFunc (int opcode, int val)
{
    static int size=0, stkTop=0;
    switch (opcode)
    {
        case -1:
            size = val;
            break;
        case 0:
            if (stkTop < size ) A[stkTop++]=val;
            break;
        default:
            if (stkTop) return A[--stkTop];
    }
    return -1;
}
int main()
{
    int B[20];
    A=B;
    stkTop = -1;
    stkFunc (-1, 10);
    stkFunc (0, 5);
    stkFunc (0, 10);
    printf ("%d\n", stkFunc(1, 0)+
    stkFunc(1, 0));
}
```

Part C

Answer all the Questions.

Each question carries five marks.

(3 Questions x 5 marks = 15 Marks)

- Q17.a. Write the difference between structure and union with any example. Explain the use of putchar() and getchar() functions. (2 marks)
- b. Write a program to check whether a number is Palindrome or not. Draw the flow chart for the same? (Note: A number is said to be Palindrome if the reversal to digits results in the same number. e.g. 121, 34543, 131, 343, 48984) (3 marks)
- Q18.a. Describe four basic data types. How can we extend the range of values. (2 marks)
- b. Write a program to check whether a number is an Armstrong number or not. Draw the flow chart for the same? (Note: Armstrong number is a number that is equal to the sum of cubes of its digits. For example; 0, 1, 153, 370, 371 and 407 are the Armstrong numbers, i.e., $153 = (1*1*1) + (5*5*5) + (3*3*3) = 1 + 125 + 27 = 153$). (3 marks)
- Q19.a Write a program to find the maximum and minimum of two numbers without using any looping or conditional statement. (Hint: Use operators and abs() function) (1 mark)
- b. Explain the use of break and continue keyword in C. (4 marks)