

(d) Which one of the following operators is used for decision making in C?

- (i) Arithmetic operator
- (ii) Relational operator
- (iii) Assignment operator
- (iv) Conditional operator.

(e) How many times will the following loop execute?

```
for (j=1; j<=10; j=j-1)
```

- (i) Forever
- (ii) Never
- (iii) 0
- (iv) 1.

(f) What does this statement mean?

```
x -= y + 1
```

- (i) $x = x - y + 1$
- (ii) $x = -x - y - 1$
- (iii) $x = x + y - 1$
- (iv) $x = x - y - 1$.

(g) What will be the output after execution of the following statements?

```
main()
{
    printf("\n ab");
    printf("\b si");
    printf("\r ha");
}
```

- (i) absiha
- (ii) asiha
- (iii) haasi
- (iv) hai.

(h) Which of the following is true about the return type functions in C?

- (i) Function can return any type.
- (ii) Functions can return any type except array and functions.
- (iii) Functions can return any type except array, functions and union.
- (iv) All the above.

(i) In which order the following gets evaluated?

(A) Arithmetic (B) Assignment (C) Logical (D) Relational

- (i) (B) → (A) → (D) → (C)
- (ii) (B) → (D) → (A) → (C)
- (iii) (B) → (C) → (D) → (A)
- (iv) (B) → (D) → (C) → (A).

(j) Find the output of the following C-code :

```
# include <stdio.h>
int main()
{
int C=1;
int S=0;
while((C>0)&&(C<60))
{
S=S+C;
C++;
}
printf("%d",S);
}
```

(i) 1771

(ii) 1770

(iii) 1772

(iv) None of these.

2. Answer **any one** question :

- (a) (i) What is meant by a variable in C language? Explain with a suitable example.
(ii) State the conditions that a variable name in C must satisfy.
(iii) What is the general form of exponential notation for a real constant? Explain the terms used in the general form with a suitable example. 2+5+(1+2)
- (b) (i) What is meant by an operator in C? Explain the functions of logical AND and logical OR operators.
(ii) Draw the flowchart for the following program segment :

```
.....
.....
if (category = A)
{
marks = marks+bonus_marks;
}
printf("%f", marks);
.....
.....
```

(2+2+2)+4

3. Answer **any one** question :

- (a) What is recursion? Write a function to evaluate factorial of n to show how the recursion works. 2+6+2

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- (b) (i) What are the necessary header files to be included in the following program to get the proper output? Justify your answer.

```
void main()
{
int number, i;
sum=0;
printf("\n enter the number");
scanf("%d", & number);
for (i=1; i<=number; i++)
{
sum=sum+(1/pow(i,2));
if (i==1)
printf("\n1+");
else if (i==number)
printf("1/(%d)^2", i);
else
printf("1/(%d)^2+", i);
}
}
```

- (ii) State the advantages of Library functions.
 (iii) Can you recognize the series which is mentioned in the above program? (1+1+2+2)+3+1

4. Answer **any one** question :

- (a) (i) What are the main data types in C? Write short notes on any two of them.
 (ii) Write a C program to display the following output : (using nested for loop)

```
*
* *
* * *
* * * *
* * * * *
```

(2+2+2)+4

- (b) (i) Write a short note on Branching statements in C.
 (ii) Write a C program to add two matrices and print the resultant matrix. 4+6

5. Answer **any one** question :

- (a) (i) What is the objective of the main() function in C? What is the purpose of printf() and scanf() in C program?
 (ii) How is a function declared in C Language?
 (iii) Write a program to swap two numbers without using the third variable. (2+2)+3+3
- (b) (i) What are the advantages of using C language over other programming languages? What are some of the limitations of C language?
 (ii) Write a C program to check whether a given number is prime or not. (4+2)+4

6. Answer **any one** question :

- (a) (i) State the differences between the declaration of a variable and the definition of a symbolic name.
 (ii) Write the valid C-expressions :

$$(A) e^{x^3+2\cos x} + \log|x^5+1| \quad (B) \tan(x^3+1) + \frac{1}{\cos x + \sec x}$$

- (iii) Let $x = 2020$, $y = 2021$, $z = 2022$. Write a C-program to rotate their values such that x has the value y , y has the value z and z has the value x . 3+3+4
- (b) (i) Write the syntax of `for-loop` and explain it.
 (ii) Using `for-loop`, write a program in C to find first 50 Fibonacci numbers.
 (iii) What is `do-while` statement? Explain with suitable example. 3+4+3

7. Answer **any one** question :

- (a) (i) Describe the two ways of passing parameters to functions. When do you prefer to use each of them?
 (ii) Write a program that use a function to sort an array of integers.
 (iii) What is the output of the following C-code?

```
#include<stdio.h>
main()
{
  int x, y;
  y=6;
  x=y<<6;
  printf("%d", x);
}
```

(2+2)+4+2

- (b) (i) Distinguish between function Call by value with Call by Address.
 (ii) Write a C-program to find sum of first n odd positive integers and to illustrate Call by value. (2+2)+6
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