

BE Semester- IV Mechanical Engg Examination Question Bank
Computer Programming and Numerical Method
All questions carry equal marks (10 marks)

- 1 Write an algorithm and draw the flowchart to accept N numbers and count how many of them where odd and also compute sum of all these odd.
- 2 Write a C program to display the following triangle for N lines
1
A B
1 2 3
A B C D
1 2 3 4 5
- 3 Write a C program to display the following triangle for N lines
1
A B
2 3 4
C D E F
5 6 7 8 9
- 4 Explain the following with proper syntax and examples.
1. Structure in C 2. Recursion
- 5 Explain the following with proper syntax and examples.
1. Pointers in C 2. Call by value Vs. Call by reference
- 6 Explain the following with proper examples.
1. Copy constructor 2. Initialization of one and two dimensional arrays in C
- 7 Explain the various I/O function with example in C.
- 8 Write a C++ program representing the circle as class to find its area, where area = $\pi * \text{radius} * \text{radius}$. Use it in main to create array of five circle objects, get radius for them and print the circle object with radius and area whose area is largest.
- 9 What is a string? How string is stored in C? Give the various functions with their use for string processing.
- 10 Answer the following Questions.
(i) Explain in brief the features of C language.
(ii) Explain logical operator and relational operator used in C language.
- 11 Draw a flow chart to find the smallest number out of three given numbers.
- 12 Write the short notes on following.
(i) Polymorphism
(ii) Difference between Object Oriented and Procedure Oriented language.
- 13 Write the short notes on following.
(i) Inheritance. (ii) Friend Function.
- 14 Answer the following.
(i) Explain printf() and scanf() giving their syntax.
(ii) What is recursion? Explain it with suitable example.
(iii) Write short note on Pointer.
(iv) Explain switch...case statement.
- 15 Write a C++ program with a class having three integer data members. Provide the member function along with other functions and constructors, to test whether given three number forms an Pythagorean triplet i.e. $x^2 + y^2 = z^2$.

- 16 Give the output of the following code. Give the explanation for the output.
1.

```
int x = 10;
void main()
{
int x = 15,y;
y = x++;
printf(“%d %d”,++y, x++);
}
```
 2.

```
void main()
{
int x[] = {1,2,3,4,5};
printf(“%d”,fun(&x[2]));
}
int fun(int *a)
{
int i=0,sum=0;
for(i=0;i<2;i++,a++)
sum += *a;
return(sum);
}
```
 3.

```
int i;
for(i=5;i<15;i++) {
printf(“%d\n”,i);
i = i - 1;
}
```
- 17 What is looping? Explain different types of loops in C and compare them. Show how to sum 1 to 10 using each of these loops.
- 18 What is structure? How can we access structure members? Clear use of nested structure using example. Compare structure with union.
- 19 Compare following.
1. Software and hardware
 2. Object and Procedure oriented programming
- 20 Write a C program to accept a string and print every third character from string only if it is lower case.
- 21 Explain the multiple if (ladder if) with example. Give the example using it.
- 22 Explain following with example w. r. to C++.
1. new operator
 2. parameterized constructor
- 23 Explain following with example w. r. to C++.
1. Copy constructor
 2. Static data member and static function member
- 24 Write a C function to exchange two numbers and use it to reverse an array of 10 integers accepted from user.
- 25 Write a C program to print multiple of N from given range of unsigned integers. For example, if N=5 and range is [17, 45] it prints 20,25,30,35,40,45.

26 Write a program to display following pattern using nested for loops.

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

27 Draw the Block diagram of Computer System and explain.

28 Write short notes on following

(i) File Operations in C.

(ii) Data types in C.

29 Write a program in C to generate Fibonacci series like following:

1, 1, 2, 3, 5, 8, 13 ...

Generate 20 such numbers.

30 What is function? Explain the function definition, function prototype and function call with example.

31 Write a program which accepts a long string and print only characters at positions which are multiple of 3.

32 Explain Truncation error, rounded off error, absolute error, relative error and percentage error.

33 Consider the following table for f(x)

X	0	10	20	40	50	60
f(x)	6	70	75	18	24	90

Calculate f(30) from the above table, using Lagrange and the divided difference Formula

34 Temperature and pressure values are given from steam tables

Temp°C	140	150	160	170	180
Pressure, bar	3.685	4.854	6.302	8.076	10.225

Using Newton's interpolation formula and find the pressure of the steam for a temp of 142°C

35 Find a real root of the equation $x^3 - x - 4 = 0$ by bisection method.

36 Use iteration method to find a root of the equation $x = (1/2) + \sin x$

37 Use Runge-Kutta method to obtain an approximate solution to the differential

equation $\frac{dy}{dx} = y - x + 5$ at the points $x = 2.1, 2.2, 2.3$ with initial condition $y(2) = 1$.

38 Evaluate $\int_1^6 \frac{dx}{1+x^4}$ by Trapezoidal rule and Simpson's $\frac{1}{3}$ rd rule.

39 Solve by iteration method: $3x + \sin x = e^x$.

40 Interpolate y at $x = 5$ from the following data

x	1	2	3	4	7
y	2	4	8	16	128

BE Semester-____ (Branch Name) Question Bank

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