Unit 1

Q1) An approximate value of π is given by X1= 22/7 = 3.142857 and its true value is X=3.1415926 find the absolute error.

Q2) An approximate value of π is given by X1= 22/7 = 3.142857 and its true value is X=3.1415926 find the relative error.

Q3) Three approximate values of the number 1/3 are given as 0.30, 0.33 and 0.34. which of these

Three is the best approximation.

Q4) find the relative error of the number 8.6 if both of its digits are correct.

Q5) Evaluate the term S=$\sqrt{3}+\sqrt{5}+\sqrt{7}$ to four significant digits and find its absolute errors.

Q6) Evaluate the term S=$\sqrt{3}+\sqrt{5}+\sqrt{7}$ to four significant digits and find its relative errors.

Q7) sum the following numbers 0.1532, 15.45, 0.000354, 305.1, 8.12, 143.3, 0.0212, 0.643 and 0.1734 where in each of which all the given digit are correct.

Q8) Two numbers are given as 2.5 and 48.289 both of which being correct to the significant figure given, find their product.

Q9) given f(x)=sin x constructs the Taylor series approximations of order 0 to 7 at x= $\pi/3$ and state their absolute errors

Q10) define the term absolute error. Given that

a= 10.00 +/- 0.05

b=0.0356 +/- 0.0002

c= 15300 +/- 100

d= 62000 +/- 500 find the max value of the absolute error in a+b+c+d

Q11) define the term absolute error. Given that

a= 10.00 +/- 0.05

b=0.0356 +/- 0.0002

c= 15300 +/- 100

d= 62000 +/- 500 find the max value of the absolute error in a+5c-d

Q12) obtain the range of the values within which the exact value of

1.265 (10.21-7.54)/47 lies, if all the numerical quantities are rounded off.

Q13) find the product of the numbers 56.34 and 12.4 which are both correct to the significant digit given.

Q14) find the quotient q=x/y where x=4.536 and y=1.2 both x and y are being correct to the digits given. Find also the relative error in the result.

Q15) prove that the relative error of a product of three non-zero numbers does not exceed the sum of the relative error in the result.

Unit- 2

Q1) Using Bisection method find the root of cos(x) – x * ex = 0 with a = 0 and b = 1.

Q2) Find the root of x4-x-10 = 0 approximately up to 5 iterations using Bisection Method. Let a = 1.5 and b = 2.

Q3) Find the positive root of the equation x3 + 2x2 + 10x – 20 using Regula Falsi method and correct up to 4 decimal places.

Q4) Find the positive root of the equation x-cos x using Regula Falsi method and correct to 4 decimal places.

Q5) The equation f(x) is given as x3 – x2 + 4x – 4 = 0. Considering the initial approximation at x=2 then the value of next approximation corrects up to 2 decimal places is given as __________

Q6) f(x) = x2 – 153 = 0 then the iterative formula for Newton Raphson Method is given by __________

Q7) If A quadratic equation x2-4x+4=0 is defined with an initial guess of 3 and 2.5. Find the approximated value of root using Secant Method

Q8) A quadratic equation x4-x-8=0 is defined with an initial guess of 1 and 2. Find the approximated value of x2 using Secant Method.

Q9) Use the Gauss-Jacobi method to solve the simultaneous linear equations

$5x + y - z = 4,$

$x + 4y + 2z = 15,$

$x - 2y + 5z = 12,$

Q10) Use the Gauss Seidel method to solve the simultaneous linear equations:

$7y + x - z = 3,$

$y + 5x + z = 9,$

$2y - 3x + 7z = 17.$

Q11) Solve the system of equations by Jacobi's iteration method.

$10a - 2b - c - d = 3$

$- 2a + 10b - c - d = 15$

$- a - b + 10c - 2d = 27$

$- a - b - 2c + 10d = -9$

Q12) Solve the system of equations by Jacobi's iteration method.

$10x = y – x = 11.19$

$x + 10y + z = 28.08$

$-x + y + 10z = 35.61$

Q13) Solve the equations using Gauss Jordan method.

$x + 2y + 6z = 22$

$3x + 4y + z = 26$

$6x - y - z = 19$

Q14) Solve the equations using Gauss Jordan method.

$2x-3y+z=-1$

$x+4y+5z=25$

$3x-4y+z=2$

Q15) Solve the equations using Gauss Jordan method.

$x+2y+6z = 12$

$3x+4y+z = 24$

$6x-y-z = 36$

Unit 3

Q1) Find n for the following data if f (0.2) is asked.

x	0	1	2	3	4	5	6
f(x)	176	185	194	203	212	220	229

Q2) Find f (0.18) from the following table using Newton's Forward interpolation formula.

x	0	0.1	0.2	0.3	0.4
f(x)	1	1.052	1.2214	1.3499	1.4918

Q3) Find Solution using Stirling's formula

x	f(x)
20	49225
25	48316
30	47236
35	45926
40	4430

Q4) Find Solution using Stirling's formula

x	f(x)
20	49225
25	48316
30	47236
35	45926
40	44306

Q5) Find Solution using Stirling's formula

x	f(x)
0	0
5	0.0875
10	0.1763
15	0.2679
20	0.3640
25	0.4663
30	0.5774

Q6) Find Solution using Lagrange's Interpolation formula

x	f(x)
300	2.4771
304	2.4829
305	2.4843
307	2.4871

x = 301

Q7) Find Solution using Lagrange's Interpolation formula

x	f(x)
2	0.69315
2.5	0.91629
3	1.09861

x = 2.7

Q8) Find Solution using Lagrange's Interpolation formula

x	f(x)
-1	3
0	-6
3	39
6	822
7	1611

x = 1

Finding f (2)

Q9) Calculate Cubic Splines

X	1	2	3	4
Y	1	5	11	8

y (1.5), y'(2)

Q10) Calculate Cubic Splines

X	1	2	3	4
Y	1	2	5	11

y (1.5), y'(3)

Q11) Calculate Cubic Splines

X	0	1	2
Y	-5	-4	3

y (0.5)

Q12) Find Solution using Newton's Divided Difference Interpolation formula

x	f(x)
300	2.4771
304	2.4829
305	2.4843
307	2.4871

x = 301

Q13) Find Solution of an equation x^3-x+1 using Newton's Divided Difference Interpolation formula

x1 = 2 and x2 = 4

x = 3.8

Step value (h) = 0.5   Finding f (2)

Q14) Find Solution of an equation 2x^3-4x+1 using Newton's Divided Difference Interpolation formula

x1 = 2 and x2 = 4

x = 3.8

Step value (h) = 0.5

Finding f (2)

Q15) Find Solution using Gauss Backward formula

x	f(x)
1940	17
1950	20
1960	27
1970	32
1980	36
1990	38

x = 1976

Unit 4

Q1) Approximate the area under the curve y = f(x) between x =0 and x=8 using Trapezoidal Rule with n = 4 subintervals. A function f(x) is given in the table of values.

x	0	2	4	6	8
f(x)	3	7	11	9	3

Q2) Approximate the area under the curve y = f(x) between x =-4 and x= 2 using Trapezoidal Rule with n = 6 subintervals. A function f(x) is given in the table of values.

x	-4	-3	-2	-1	0	1	2
f(x)	0	4	5	3	10	11	2

Q3) Find Solution using Trapezoidal rule

x	f(x)
1.4	4.0552
1.6	4.9530
1.8	6.0436
2.0	7.3891
2.2	9.0250

Q4) Find Solution using Simpson's 1/3 rule

x	f(x)
1.4	4.0552
1.6	4.9530
1.8	6.0436
2.0	7.3891
2.2	9.0250

Q5) Find Solution using Simpson's 1/3 rule

x	f(x)
0.0	1.0000
0.1	0.9975
0.2	0.9900
0.3	0.9776
0.4	0.8604

Q6) Find Solution of an equation 1/x using Simpson's 1/3 rule

x1 = 1 and x2 = 2

Step value (h) = 0.25

Q7) Find Solution using Simpson's 3/8 rule

x	f(x)
1.4	4.0552
1.6	4.9530
1.8	6.0436
2.0	7.3891
2.2	9.0250

Q8) Find Solution using Simpson's 3/8 rule

x	f(x)
0.0	1.0000
0.1	0.9975
0.2	0.9900
0.3	0.9776
0.4	0.8604

Q9) Find Solution of an equation 1/x using Simpson's 3/8 rule

x1 = 1 and x2 = 2

Step value (h) = 0.25

Q10) Find y (0.5) for y'=-2x-y, y (0) = -1, with step length 0.1 using Euler method

Q11) Find y (0.2) for y'=-y, x0=0, y0=1, with step length 0.1 using Euler method (1st order derivative)

Q12) Find y (0.5) for y'=-2x-y, y (0) = -1, with step length 0.1 using Improved Euler method

Q13) Find y (0.2) for y'=-y, x0=0, y0=1, with step length 0.1 using Improved Euler method

(1st order derivative)

Q14) Find y (0.2) for y'=x2y-1, y (0) = 1, with step length 0.1 using Taylor Series method

Q15) Find y (0.1) for y''=1+2xy-x2z, x0=0, y0=1, z0=0, with step length 0.1 using Runge-Kutta 4 method (2nd order derivative)

Unit 5

Q1) Explain about constructor.

Q2) Explain about Destructor.

Q3) Explain function in c++.

Q4) explain function overloading

Q5) Explain basic concept of OOP.

Q6) List out application of OOP.

Q7) define classes and object with example.

Q8) difference between constructor and destructors with example.

Q9) What are the different features of c++?

Q10) What is inheritance in C++ and name the different types of inheritance?

Q11) Explain structured (Or) procedure oriented Vs. Object Oriented programming.

Q12) Explain structure of C++ program with example?

Q13) Explain in detail various data types in C++

Q14) Define programming language? Explain various programming languages

Q15) Explain various types of data types in C++ with example?