

**GC-074004**

Seat No. _____

B.C.A. (Sem. IV) Examination**March - 2019****BCAOC-404 : Computer Oriented Numerical Methods**

Time : 3 Hours]

[Total Marks : 70

Instructions

- 1) Figures on the right indicate the marks.
- 2) All Questions are compulsory.
- 3) Answer of each question must start on a new page.
- 4) Answer of all sub-questions of a question should be written in continuous order.

Q.1 Do as Directed(Any 14):**14**

- (1) Define: Accuracy and Precision.
- (2) If $a=0.8461538461$ is approximated by 0.84615 then find percentage relative error.
- (3) List graphical methods.
- (4) What is the important of tabulation of data in statistics?
- (5) Define the term: reverse straight line.
- (6) Subtract $0.8916E8$ from $0.3122E11$.
- (7) What is meant by numerical integration?
- (8) Divide $0.7816E7$ by $0.3821E4$.
- (9) Define difficulties in computing.
- (10) Define: normalized floating point.
- (11) Define Absolute and Relative Errors.
- (12) Write Simpson's $1/3$ rule to integrate tabulated function.
- (13) Write the normal equations to fit straight line.
- (14) What is the rate of convergence of Newton-Raphson method?
- (15) State the formula to find the first order backward difference.
- (16) What is meant by the curve of best fit?

Q.2 Explain Any Two.**14**

- (a) Define error. Explain the types of errors with examples.
- (b)
 1. Discuss the method Bisection to find the root of an equation $f(x) = 0$. **04**
 2. Determine the area bounded by the given curve and X-axis between $x=25$ to $x=25.6$ by Trapezoidal rule from the following data **03**

X	25.0	25.1	25.2	25.3	25.4	25.5	25.6
Y	3.205	3.217	3.232	3.245	3.256	3.268	3.280

- (c) Use Newton-Raphson method to find a real root of the equation $x^3 - 2x - 5 = 0$ correct to three decimal places.

Q.3 Explain Any Two.**14**

- (a) Determine the root of equation $x^4 - x - 10 = 0$. Correct up to 3 place of decimal by using Bisection method.
- (b) Find smallest positive root of an equation $x - e^{-x} = 0$ using RegulaFalsi method correct to four significant digits.
- (c) Evaluate $\int_0^4 e^x dx$; using Simpson's $1/3$ Rule using four strips.

Q.4 Explain Any Two.**14**

- (a) What do you understand by the term interpolation? Derive Newton's Backward Difference interpolation formula?

- (b) Write a C program for Lagrange's interpolation.

- 1 From the following data find $f(10.5)$ using Newton Divided Difference formula:

04

x	10	11	13	17
f(x)	2.3026	2.3979	2.5649	2.8332

- 2 Find the Lagrange's interpolation polynomial form

03

X	0	1	4	5
f(x)	1	3	24	39

- (c) Write a C program for Newton's Forward Interpolation Formula.

Q.5 Answer Any Two.**14**

- (a) fit a parabola to the given data:

X	-2	-1	0	1	2
Y	0.17	0.53	0.57	0.58	0.33

- (b) Fit a straight line to the following data:

X	0	1	2	3	4
Y	1	1.8	3.3	4.5	6.3

- (c) 1. Predict y at $x=3.75$ by fitting a power curve $y=ax^6$ to the given data:

04

X	1	2	3	4	5	6
Y	2.98	4.26	5.21	6.10	6.80	7.50

2. Find polynomial fitting the data

03

X	0	1	2	3
Y	-1	1	1	-2