M. Sc. (Computer Science and Applications) 1st Semester Examination – 2020 (CBCS)

Subject: Computer Science and Applications

Paper: MCSA – 103 (Mathematics for Computing)

Full Marks: 40 **Time: 2 Hours**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any 8 (eight) questions. All questions carry equal marks of 5.

1. Write an algorithm to find the root of the equation $x^2 - x - 6 = 0$, using Newton - Rapson's method. 5

2. Find a real root of the equation $xe^x - 2 = 0$ correct up to 3 significant figures by Regula Falsi Method. 5

3. Evaluate y (0.4) using R-K Method of 4th order from the differential equation $\frac{dy}{dx} = x^2y^2$ when given y(0) = 0, taken h = 0.2. 5

4. Write an algorithm to solve linear simultaneous equations using Gauss-Seidel iterative method. 5

5. Write a program to evaluate the integration $\int_0^1 \frac{dx}{3+x^2}$ using Simpson 1/3 rule taking n = 5. 5

6. Estimate the value of $\sin(15^0)$ using Newton-Gregory's forward interpolation formula using the following table

x	10	20	30	40	50
f(x) = sin(x)	0.1736	0.342	0.5	0.6428	0.768

5

7) What is Eulerian Graph? Write an algorithm to check whether a given undirected graph is Eulerian Graph or not. 5

8) Write any one algorithm for finding minimum spanning tree from a weighted undirected graph. 5

9) Prove that congruence is an equivalence relation. 5

10) What are converse, inverse and contra - positive of an implication? What is inhibition? Explain all with suitable examples. 5