C 63043 **(Pages : 3)** **Name.....**

Reg. No.....

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2019

(CUCSS)

Computer Science

CSS 2E 05 (0—NUMERICAL AND STATISTICAL METHODS

(2014 Admissions)

Time : Three Hours Maximum : 36 Weightage

Part A

Answer **all** *questions.*
Each question carries 1 weightage.

1. What are inherent errors ?

2. Write an example for algebraic equation, polynomial equations, transcendental equations.

3. What is solution by elimination in linear equations ?

4. Write an example for Langrange interpolation polynomial.

5. Explain error analysis in Trapezoidal rule.

6. What is composite Simpson's 1/3 rule ?

7. Define probability in Statistics.

8. Write the normal distribution function with an example.

9. Consider the following linear equations :

Minimize W = — 5x + 8y + 4z

subject to the contraints

x + y = 2

y — z 3

2x — y — 1

x O, y O, z 0.

Formulate the dual for this Linear Programming Problem.

10. Explain the degeneray conditions in Simplex method.

11. What is the probability of getting a sum nine from two throws of a dice ?

12. Explain the addition theorem in probability.

(12 x 1 = 12 weightage)

Turn over

Part B

Answer any six *questions.*
Each question carries 2 *weightage.*

13. What are the limitations of Newton Raphson method.

14. Explain Jacobi iteration method.

15. Let y(0) = 1,y(1) = 0,y(2) =1 and y(3) = 10. Find y(4) using Newtons Forward Difference formula.

16. From the following table, find the area bounded by the curve and x axis from x = 7.47 to x = 7.52 using Simpson's 1/3 rule

x :	7.47	7.48	7.49	7.50	7.51	7.52
f :	1.93	1.95	1.98	2.01	2.03	2.06

17. A box contains three coins : two regular coins and one fake two-headed coin (p(H) = 1).
    - You pick a coin at random and toss it. What is the probability that it lands heads up ?
    - You pick a coin at random and toss it, and get heads. What is the probability that it is the two-headed coin ?

18. Describe the algorithm of Gauss Seidal method.

19. Explain Adams-Bashforth method.

20. Explain the different steps involved in the Assignment problem.

21. Explain different types of solutions in graphical method.

(6 x 2 = 12 weightage)

Part C

Answer any three *questions.*
Each question carries 4 *weightage.*

22. Find a root of an equation $f(x) = x^3 - x - 1$ using Bisection method.

23. Solve linear equations 7y + 2x = 11, 3x - y = 5 using Gauss Jordan Elimination method.

24. Using Newton's forward differentiation method to find solution, x = 1.2 :

x	$f(x)$
1.0	2.7183
1.2	3.3201
1.4	4.0552
1.6	4.9530
1.8	6.0496
2.0	7.3891
2.2	9.0250

23. Find y(0.2) for y' = -y,y(0) = 1, with step length 0.1 using Runge-Kutta fourth order method.

26. Explain Bayes theorem. An urn B_1 contains 2 white and 3 black balls and another urn B_2 contains 3 white and 4 black balls. One urn is selected at random and a ball is drawn from it. If the ball drawn is found black, find the probability that the urn chosen was B_1.

27 Find solution using Simplex method :

Maximize $Z = 3x_1 + 9x_2$

subject to

$x + 4x_2 \leq 8$

$x + 2x_2 \leq 4$

and $x_1, x_2 \geq 0$.

(3 x 4 = 12 weightage)