23P307S (Pages: 2) Name: .....

Reg.No: .....

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(CBCSS - PG)

(Supplementary/Improvement)

CC19P CSS3 E01F - NUMERICAL AND STATISTICAL METHODS

(Computer Science)

(2019 Admission onwards)

Time : 3 Hours Maximum : 30 Weightage

Part-A

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

1. Explain errors and their types.
2. Carry out Jacobi's iterative method to solve the equations : 20x+y-2z=17,
   3x+20y-z= -18,
   2x-3y+20z=25
3. Calculate $\int_0^{\pi} \sin x \, dx$ using trapezoidal rule, taking h= $\frac{\pi}{10}$
5. Three biased coins are tossed. What is the probability of getting.
   a. All head
   b. Two head
   c. One head
   d. Atleast one head
   e. Atleast two head
   f. All tails
6. State and prove the addition theorem for mutually exclusive events.
7. Define probability mass function with an example. Also the properties of the pmf.

(4 × 2 = 8 Weightage)

Part-B

Answer any ***four*** questions. Each question carries 3 weightage.

8. Determine a real root of the equation x^3-2x-5=0, by the method of regula- falsi position correct to 3 decimal places.
9. Find the root of the equation 2x-log x=7 , using secant method to 5 decimal places.
10. Find the cubic polynomial which takes the following values using Newton's backward difference method.

x	0	1	2	3
y	1	2	1	10

11. Compute y(0.8) and y(1.0) using Milne's method, given $\frac{dy}{dx} = 1 + y^2$, y(0)= 0.

12. A university has to select an examiner from a list of 50 persons. 20 of them are women and 30 men. 10 of them know Hindi and 40 do not.15 of them are teachers and remain are not. What is the probability of selecting a Hindi knowing women teacher?

13. State Bayes Theorem. The probability that a doctor will diagnosis a particular disease correctly is 0.6. The probability that a patient will die by his treatment after correct diagnosis is 0.4 and probability of death by wrong diagnosis is 0.7. A patient of the doctor who had the disease died . What is the probability that his disease was not correctly diagnosed.

14. Solve the linear equations using graphical method, $2x + y \geq 8$, $2x + 2y \geq 10$, $x \geq 0$, $y \geq 0$

(4 × 3 = 12 Weightage)

Part-C

Answer any ***two*** questions. Each question carries 5 weightage.

15. Apply Gauss elimination method to solve the equations: x+4y-z=-5,
x+y-6z= -12,
3x-y+z=-5

16. Find the value at x=4 using Lagrange's formula.

x	1.5	3	6
f(x)	-0.25	2	20

17. Solve the following Transportation problem using North west corner rule and Least cost method to minimize the total cost of transportation. Compare results

	Destination 1	Destination 2	Destination 3	Destination 4	Supply
Source 1	14	25	45	5	6
Source 2	65	25	35	55	8
Source 3	35	3	65	15	16
Supply	4	7	6	13	

18. A company has 4 machines(M1,M2,M3 and M4) to do 3 jobs(J1,J2 and J3) . Each job can be assigned to one and only one machine. The cost of each job on each machine is given in the following table. What are the job assignments which will minimize the cost?

	M1	M2	M3	M4
J1	18	24	28	32
J2	8	13	17	19
J3	10	15	19	24

(2 × 5 = 10 Weightage)

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