

PARUL UNIVERSITY
FACULTY OF IT & COMPUTER SCIENCE
MCA Summer 2017 – 18 Examination

Semester: 2

Date: 25/05/2018

Subject Code: 05291151

Time: 10:30 am to 1:00 pm

Subject Name: Computer Oriented Numerical and Statistical Methods

Total Marks: 60

Instructions:

- All questions are compulsory.
- Figures to the right indicate full marks.
- Make suitable assumptions wherever necessary.
- Start new question on new page.

Q.1 Answer the followings.**A. Write short notes:****(05)**

- Define : Sample Space
- Construct the Linear Interpolation formula for $f(x)$ with given values $f(1) = 3$ and $f(2) = -5$, $f(4) = 7$
- If $f(x) = \frac{1}{x}$, find the divided difference $x=1, 3, 7$
- Write Simpson's $\frac{3}{8}$ Rule.
- In a Binomial Distribution, Mean = 12 and variance = 8 then find n and p.

B. Multiple choice type questions/ Give the sentence true or false. (Each of 01 marks)**(10)**

- The Probability of getting an Odd number when a Cubical die is thrown.
 (a) $\frac{1}{2}$ (b) 3 (c) 6 (d) $\frac{1}{3}$
- If A and B are two Mutually Exclusive events then $P(A \cup B) = P(A) + P(B)$ (True/ False)
- $(1+\Delta)(1-\nabla) =$ _____
 (a) 1 (b) 2 (c) 0 (d) -1
- Mean of Poisson Distribution is _____
 (a) m (b) 0 (c) m^x (d) 1
- The Mean of a Poisson Distribution is 3 then its Standard Deviation is: _____
 (a) $\sqrt{3}$ (b) 0 (c) 1 (d) $\sqrt{2}$
- Sum of two independent Poisson Variates is also a Poisson Variate (True/ False)
- If A and B are two Independent events and $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{5}$ then
 $P(A \cap B) = \frac{1}{10}$ (True/False)
- The Variance of Binomial Distribution is _____
 (a) np (b) npq (c) 0 (d) None of these
- If A and B are two Mutually Exclusive events and $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{2}$ then $P(A \cup B) =$ _____
 (a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{1}{4}$ (d) $\frac{3}{2}$
- In a Binomial Distribution the value of mean is always greater than the value of _____
 (a) Standard Deviation (b) 1 (c) Variance (d) None of these

Q.2 Answer the followings.**(15)**

- Fit the best Straight Line to the data :

x	-1	0	1	2
y	1	0	1	4

03

2. Calculate Mode from the given data :

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of Students	3	5	7	10	12	6

02

3. If A, B and C are three Mutually Exclusive and Exhaustive events & if $3P(A) = 2P(B) = 6P(C)$ then find $P(A \cup B)$.

03

4. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Trapezoidal Rule with $h = 0.2$

02

5. Find $x^3 - 5x + 1$ using Newton- Raphson method correct to two decimal places

02

6. Find root of equation $x^3 - 4x + 2$ by using bisection method

03

Q.3 Answer the following. (Any three)

(15)

1. The Standard Deviation of a Poisson Variable is 0.8 then find its Mean, $P(0)$ & $P(1)$

2. Find $f(x)$ using Newton's Divided Difference formula from the following table:

x	1	2	7	8
f(x)	1	5	5	4

3. Using Euler's method, find $y(0.1)$ given that $\frac{dy}{dx} = y - \frac{2x}{y}$, $y(0) = 1$, $h = 0.1$

4. For a Binomial Variate, $n = 10$ and $P(x = 5) = 2 * P(x = 4)$, find the value of p .

Q.4 Answer the following.

A. Use Runge-Kutta method of fourth order to find $y(0.1)$ given by $\frac{dy}{dx} = 2x + y$, $y(0) = 1$, $h = 0.1$ **(05)**

B. Solve the following system of equations by Gauss- Seidel method up to fourth approximation **(10)**
 $10x + y + z = 6$, $x + 10y + z = 6$, $x + y + 10z = 6$

OR

B. Two types of drugs were used on 5 and 7 patients for reducing their weights. Drug A is imported and Drug B indigenous. The decrease in the weight after using the drugs for six months was recorded as given below: Is there significant difference in the efficacy of the two drugs? If not which drug should you buy? (Table value : 2.225) **(10)**

Drug A	11	13	12	14	10		
Drug B	12	9	8	15	14	9	10