



**ADAMAS UNIVERSITY**  
**END-SEMESTER EXAMINATION : JANUARY 2021**  
(Academic Session: 2020 – 21)

<b>Name of the Program:</b>	B.Tech.	<b>Semester:</b>	III
<b>Paper Title :</b>	Probability, Statistics and Numerical Methods	<b>Paper Code:</b>	SMA42111
<b>Maximum Marks :</b>	40	<b>Time duration:</b>	3 hrs.
<b>Total No of questions:</b>	8	<b>Total No of Pages:</b>	2

Instructions:

1. At top of Answer Sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. Assumptions made if any, should be stated clearly at the beginning of your answer.
3. All parts of a Question should be answered consecutively.

**Answer all the Groups**  
**Group A**

Answer all the questions of the following

$5 \times 1 = 5$

1.
  - a) Define population and sample.
  - b) What is the range of correlation coefficient?
  - c) What is the order of convergence of Newton-Rapson method?
  - d) Define degree of precision of a quadrature formula.
  - e) What is random experiment?

**GROUP –B**

Answer *any three* of the following

$3 \times 5 = 15$

2. The following data gives corresponding value of pressure and specific volume of a super-heated steam: [5]

<b>v</b>	1.0	1.2	1.4	1.6	1.8	2.0
<b>p</b>	0	0.128	0.544	1.296	2.432	4.00

Find the rate of change of pressure with respect to volume when  $v=2$ .

3. Find out the root of the following equation using Regula-falsi method  $x^3 - 5x - 7 = 0$  that lies between 2 and 3, correct to 3 decimal places. [5]
4. In a certain assembly, 3 machines B1, B2 and B3 make 30 %, 45% and 25% respectively of the product. It is known from past experience that 2%, 3% and 2% of the product made is defective. Now a finished product is selected. what is the probability that it is defective? If the product is defective, then what is the probability that it is made by B1? [3+2]

5. The A.M. calculated from the following data is 67.45 inches. Find the value of missing frequency  $f_3$ : [5]

Height (inches)	60-62	63-65	66-68	69-71	72-74
Frequency	15	54	$f_3$	81	24

### GROUP –C

Answer *any two* of the following

$2 \times 10 = 20$

6. Goals scored by two teams A and B in football seasons were as follows:

Team A	27	9	8	5	4
Team B	17	9	6	5	3

Find out which team is more consistent?

[10]

7. (a) Use R-K method of order two to find  $y(0.2)$  and  $y(0.4)$  given that

[6]

$$y \frac{dy}{dx} = y^2 - x, y(0) = 2, \text{ taking } h=0.2.$$

- (b) Evaluate  $\int_{-1}^0 x e^x dx$  by using Trapezoidal rule taking  $n=6$ .

[4]

8. (a) Out of two regression lines given by  $x + 2y = 5$  and  $2x + 3y = 8$ , which one is the regression line of  $x$  on  $y$ ? Also find the values of  $\bar{x}$ ,  $\bar{y}$ ,  $r_{xy}$  and  $\sigma_y$ , given that  $\sigma_x = 12$ .

[1+1+1+2+2]

- (b) Find the median of the following data

[3]

C.I.	0-20	20-40	40-60	60-80	80-100
f	8	15	6	7	5

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