



	InSem Examination-IISummer2024		
	Exam Seat No.:		
	Academic Year:2023-2024	Semester: IV	
	Name of Programme: S.Y. B.Tech (AIDS/Comp/CSD/IT) Pattern: 2022		
	Name of Course: Applied Mathematics-III	Course Code: SMH222111	
	Max. Marks: 30	Duration: 1 hr	

	<p>Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.</p> <ol style="list-style-type: none">1. This question paper contains 02 pages.2. Answer to each new question is to be started on a new page.3. Assume suitable data wherever required, but justify it.4. Draw the neat labelled diagrams, wherever necessary.5. Use of non-programmable calculator is allowed.6. The last columns indicate the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.	
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Question No. 1 Attempt following Question

- a) For a certain frequency table which has been partly reproduced here. The mean was found to be 1.46, Find missing frequencies: (5) CO1

C.I.	0	1	2	3	4	5	Total
f	46	-	-	25	10	5	200

OR

- b) Obtain the median and mode from the following frequency distribution. (5) CO1

Marks	0-4	4-8	8-12	12-14	14-18	18-20	20-24	24-28
No. of students	10	12	18	7	5	3	4	6

- c) The prices of shares X and Y are given below, state which share is more stable? (5) CO3

A	55	54	52	53	56	58	52	50	51	49
B	108	107	105	105	106	107	104	103	104	101

OR

- d) Find standard deviation and mean for the following data: (5) CO3

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	6	14	10	8	1	3	8

- e) The first four moments of a distribution about the value 5 are 2, 20, 40 and 50 respectively. Determine the moments about mean, mean and standard deviation, also find coefficient of skewness and kurtosis. (5) CO1

OR

- f) Calculate first four central moments from the following data: (5) CO1

X	0	1	2	3	4	5	6	7	8
F	1	8	28	56	170	56	28	8	1

Also find coefficient of skewness and kurtosis.

Question No. 2 Attempt following Question

- a) Two dice are rolled. Let X denote the random variable which counts total number of points on uppermost face. Find probability distribution function, expected value and variance of the distribution. (5) CO1

OR

- b) The diameter say X of an electric cable is assumed to be a continuous variable such that, (5) CO1
 $f(x) = 6x(1 - x), \quad 0 \leq x \leq 1$

i) Check whether above is probability density function.

ii) Obtain the expression for the distribution function of X

iii) Determine the value of k such that $P(x < k) = P(x > k)$

- c) If a random variable X takes values 1,2,3,4,5 such that (5) CO2
 $2P(x = 1) = 3P(x = 2) = P(x = 3) = 5P(x = 4) = 7P(x = 5)$ then find probability distribution function, expected value and $P(2 < X \leq 5)$

OR

- d) A random variable X has following probability distribution: (5) CO2

X	1	2	3	4	5	6	7
P(X)	k	2k	3k	k^2	$k^2 + k$	$2k^2$	$4k^2$

Find i) the value of k, ii) $P(x > 5)$ iii) $P(0 < x < 5)$

- e) The probability density function is given by $f(x) = \lambda x e^{-x}, x > 0$. (5) CO2

Find i) The value of λ ii) Expected value iii) Variance.

OR

- f) The probability density function is given by $f(x) = kx^2(1 - x^3)$. (5) CO2

Find i) The value of k ii) Expected value iii) Variance.

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