P P SAVANI UNIVERSITY

Fourth Semester of B. Tech. Examination

November 2022

SESH2022 Numerical & Statistical Analysis

21.11.2022, Monday **Time: 01:00 p.m. To 03:30 p.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

	Answer the following. (Attempt any Three)		**CO**	**BTL**
Q - 1	Find the image of the region bounded by $x = 0, y = 0, x = 1, y = 2$ under the map $w = z + 2 - i$.	**[10]**	**4**	**5**
Q - 2	If $u + iv$ is analytic, show that $v - iu$ and $-v + iu$ are also analytic.	**[10]**	**4**	**4**
Q - 3	Using Gauss elimination method solve the system, $x + y + z = 2$ $x + 2y + 3z = 5$ $2x + 3y + 4z = 11$	**[10]**	**1**	**5**
Q - 4	Using Newton-Raphson's method find the root of the equation $x^2 - 4x - 7 = 0$ near $x = 5$ to the nearest thousandth.	**[10]**	**1**	**3/4**
Q - 5	The vertical distance in meters covered by a rocket from t=8 to t=30 seconds is given by, $s = \int_8^{30} \left(2000 \ln\left[\frac{140000}{140000 - 2100t}\right] - 9.8t\right) dt$ Use Simpson $\frac{3}{8}$ rule to find the approximate value of the integral.	**[10]**	**2**	**3**

SECTION – II

	Answer the following. (Attempt any Three)		**CO**	**BTL**
Q - 1	Answer the following.	**[10]**	**3**	**2/3**
(i)	The mean of 1, 2, 3, 4, 5, 6 is _____.			
(ii)	The median of 11, 18, 15, 13, 19 is _____.			
(iii)	The mode of 89, 78, 45, 65, 98, 56, 74, 98, 65, 98 is _____.			
(iv)	Write a formula of Probability.			
(v)	Write a formula of Poisson probability function.			
Q - 2	The random variable x is known to be uniformly distributed between 1 and 1.5. (a) Show the graph of the probability density function. (b) Compute $P(x = 1.25)$ (c) Compute $P(1.0 \leq x \leq 1.25)$ (d) Compute $P(1.20 < x < 1.5)$	**[10]**	**4**	**5**
Q - 3	Consider a binomial experiment with $n = 10$ and $p = 0.10$. (a) Compute $f(0)$ and $f(2)$. (b) Compute $P(x \leq 2)$ and $P(x \geq 1)$. (c) Compute $Var(x)$ and σ.	**[10]**	**4**	**5**

Q - 4	Is there reason to believe that the life expected in south and north India is same or not from the following data. South: 34.0, 39.2, 45.1, 48.7, 49.4, 45.9, 55.3, 42.7, 43.7 North: 49.7, 55.4, 57.0, 54.2, 50.4, 44.2, 53.4, 57.5, 61.9, 56.6, 58.2	**[10]**	**3**	**4**
Q - 5	Find the Karl-Pearson's coefficient of correlation.	**[10]**	**3**	**5**

X	1	5	10	11	14	17
Y	5	7	8	4	3	7

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CO : Course Outcome Number BTL : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create