RV College of Engineering®
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Department of Mathematics

Date: 6.11.2025	**CIE - 1**	**Max. Marks: 50**
Semester: III	**Third Semester 2025-2026** **Branch: AS, BT, CH, IEM, ME**	**Duration: 2 Hrs.**
Course Title: Statistics, Laplace Transform and Numerical Methods		**Course Code: MA231TB**

Instructions to candidates: ***Answer all questions.***

Sl. No.	Quiz (Part-A)	M	BT	CO
1	The first two moments about the point $x = 2$ are 1 and 16 then find the mean and the second central moment.	2	1	1
2	If two regression equations of the variables x and y are $x = 18.13 - 0.86y$, $y = 11.6 - 0.5x$, then the mean values of x and y are ____ and _____.	2	1	1
3	The following data regarding the heights(y) and the weights(x) of twelve college students are given $\sigma_x = 16.8, \sigma_y = 10.8$, $\sum(x - \bar{x})(y - \bar{y}) = 2020$, the regression coefficient of x on y is _____.	2	2	3
4	In a bivariate data on x and y, var(x) = 49, var(y) = 9 and cov(x, y) = -17.5. Find the coefficient of correlation between x and y.	2	2	2
5	Obtain the Laplace transform of the function $f(t) = cos^2(2t)$.	2	2	4
	Test (Part-B)			
1	The marks obtained by 50 students in a Mathematics test are given below: Marks: 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 No. of students: 4 | 8 | 10 | 15 | 8 | 5 Compute first four moments about the mean and also find the measures β_1 and β_2 for the following distribution and comment on the nature of the distribution of students.	10	2	1
2	Fit a multiple linear regression plane to the following data and predict wear(y) when oil viscosity is (x_1) is 30 and load (x_2) is 1400. Wear(y): 193 | 230 | 172 | 91 | 113 | 125 Oil viscosity (x_1): 1.6 | 15.5 | 22.0 | 43.0 | 33.0 | 40.0 Load(x_2): 851 | 816 | 1058 | 1201 | 1357 | 1115	10	3	2
3a	Find the rank correlation coefficient for a group of 6 persons between their examination marks and IQ's (intelligent quotients) Exam Marks: 70 | 60 | 80 | 90 | 10 | 20 I.Q: 110 | 100 | 140 | 120 | 80 | 90	6	2	3

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3b	In a partially destroyed record, only the following results are available. Regression equations are $8x - 11y = 66$, $40x - 18y = 214$, variance of x is 9 find the correlation between x and y and the standard deviation of y.	4	3	4
4	The following data represents carbon dioxide emission from coal-fluid boilers (in units of tons) over a period of years 1965 to 1977. Standardizing the year variable(x), the following table is obtained:	10	3	3
	Find the regression model of y on x and x on y and correlation coefficient.			
5	Determine the transformation in frequency domain, if the function in time domain is given by $f(t) = \frac{(\sqrt{t}-1)^2}{\sqrt{t}} + \sin(2t)\cos(3t) + e^{-t}\cosh^2(3t)$	10	1	2

Year(x)	0	5	8	9	10	11	12
CO_2 emission(y)	910	680	520	450	370	350	340

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distributions	Particulars	CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Max Marks	14	22	18	6	14	22	24	--	--	--

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