KIET Group of Institutions

(Roll Number:)

(Department of Applied Science)
B.Tech, IV Semester
CT-2 Examination, (2019-20)Even Semester
(Mathematics-IV) (KAS-402)

Duration:2hrs **Max. Marks: 60**

Section-A

Attempt all the questions of this section **(2X10=20)**

Q. No.		Question	Marks	CO	BL
1.	a	Define radio equation.	2	2	1
	b	Explain the moments about mean.	2	3	2
	c	Define the lines of regression.	2	3	1
	d	Describe the relation between the second moment about origin and second moment about mean.	2	3	2
	e	Discuss the types of Kurtosis.	2	3.	2
	f	Show that if one of the regression coefficients is greater than unity then other will be less than unity.	2	3	3
	g	Describe addition law of probability.	2	4	2
	h	Describe the two dimensional wave equation.	2	2	2
	i	Determine the normal equations of the curve $y = \frac{a}{x} + b\sqrt{x}$.	2	3	3
	j	Define moment generating function of a distribution.	2	3	1

Section-B

Attempt all the questions of this Section **(5X4=20)**

Q. No.	Question	Marks	CO	BL
2	Calculate the variance and third central moment from following data x: 0 1 2 3 4 5 6 7 8 f: 1 9 26 59 72 52 29 7 1 Also calculate the value of β_1. OR Calculate the values a and b so that the curve $y = ae^{bx}$ fits the data given in the table. x: 2 4 6 8 10 y: 4.077 11.084 30.128 81.897 222.62	5	3	3
3	If $2x + 3y = 7$ and $5x + 4y = 9$ are two lines of regression, then describe the following: (i) mean values of x and y, (ii) the regression coefficients, (iii) the correlation coefficient between x and y. OR	5	3	2

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	Describe coefficient of correlation. If θ is the acute angle between the two lines of regression then prove that $tan\,\theta = \frac{1-r^2}{r}\frac{\sigma_x\sigma_y}{{\sigma_x}^2+{\sigma_y}^2}$ where r, σ_x, σ_y have their usual meaning. Also give the significance of the formula when $r = 0, \pm 1$.			
4	A student takes his examination in four subjects a, b, c, d. He estimates his chances of passing in a as $\frac{4}{5}$, in b as $\frac{3}{4}$, in c as $\frac{5}{6}$ in d as $\frac{2}{3}$. To qualify, he must pass in a, and at least two other subjects. Calculate the probability that he qualifies. OR A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is $\frac{1}{7}$and that of wife's selection is $\frac{1}{5}$. Calculate the probability that(i) both of them will be selected (ii) only one of them will be selected and (iii) none of them will be selected.	5	4	3
5	Determine the moment generating function of the exponential distribution $f(x) = \frac{1}{c}e^{-x/c}$, $0 \leq x \leq \infty$, c >0. Also find mean and standard deviation. OR First four moments of a distribution about 2 are 1, 2.5, 5.5 and 16. Determine the first four moments about the mean and origin.	5	3	3

	Section-C				
	Attempt all the questions of this Section				**(10X2=20)**
Q. No.	**Question**	**Marks**	**CO**	**BL**	
6	A square plate is bounded by lines $x = 0, y = 0, x = 20, y = 20$. It's faces are insulated. The temperature along the upper horizontal edge is given by $u(x, 20) = x(20 - x)$ and other three edges are kept at zero temperature. Evaluate the steady state temperature in the plate OR Evaluate the voltage v in a transmission line of length $5m$ if t seconds after its ends are suddenly grounded; given that R and G are negligible and $i(x, 0) = i_o, v(x, 0) = v_0 \sin\frac{3\pi x}{5}$.	10	2	5	
7	Calculate the correlation coefficient for the following data: x: 21, 23, 30, 54, 57, 58, 72, 78, 87, 90 y: 60, 71, 72, 83, 110, 84, 100, 92, 113, 135 OR Calculate the rank correlation coefficient for the following data: x: 74, 75, 78, 72, 78, 77, 79, 81, 79, 76, 72, 71 y: 47, 44, 40, 48, 49, 45, 46, 42, 42, 39, 46, 40	10	3	3	

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