

DASHAIN VACATION ASSIGNMENT

Basic Mathematics – XII (Mgmt.)

Statistics

Short Questions:

- Find mean devian from mean and median for the data:
5, 8, 12, 6, 9
- Find S.D. for the data:
20, 25, 30, 36, 32, 43
- The median, mode and coefficient of Skewness for a certain distribution are respectively 17.4, 15.3, 0.35. Calculate mean and coefficient of variation.
- Find correlation coeff. between two variables from the following data:
 $n = 15$, $\sigma_x = 3.2$, $\sigma_y = 3.4$, $\Sigma(x - \bar{x})(y - \bar{y}) = 122$
- From the given results, find the regression coefficients:
 $\sigma_x = 20$, $\sigma_y = 15$, $r = 0.48$

Long Questions:

- Scores of two golfers for 6 rounds were as follows:

Golfer A	74	75	80	78	72	77
Golfer B	86	84	80	88	87	85

Find which golfer may be considered to be a more consistent player?

- Find appropriate coeff. of Skewness from the following data:

Income	Below 100	100–140	140–180	180–220	220–260
No. of workers	5	12	25	14	8

- Using product moment formula, find the coeff. of correlation between the price and sales

Price:	25	21	28	26	20	18
Sales:	60	54	66	68	53	57

- The following table gives the normal weight of a baby during the first six months of life:

Age in month	0	2	3	5	6
weight	5	7	8	10	12

Estimate the weight of a baby at the age of 4 months.

Probability

- The probability that Aashish gets grade B in mathematics is 0.42 and the probability that he will get grade A is 0.38 what is the probability that Aashish will get grade A or grade B in mathematics?
- The chance that A can solve a certain problem is $\frac{1}{4}$; the chance that B can solve it is $\frac{2}{3}$, find the chance that (i) the problem will be solved if they both try. (ii) A solves the problem but B can't (iii) none of them can solve the problem.
- Suppose 3 cards are drawn from a well shuffled deck of 52 cards. What is the probability of getting
 - all three spades?
 - two aces?
 - all three black?
- Find the probability of getting two heads twice in 5 tosses of two coins.
- If a dice is thrown 16 times; find mean and standard deviation for the binomial distribution of even numbers.
- The average percentage of a failure in a certain examination is 25%. What is the probability that out of 5 students
 - 1 student will pass the examination.
 - 2 or more students will pass the examination?

Calculus

- Find, from first principle, the derivative of:
 - $\tan^{-1}x$
 - $\operatorname{cosec}^{-1}x$
 - $e^{\sin x}$
 - $e^{\sec x}$
 - $\log(\cot x)$
 - $\log(\operatorname{cosec} x)$
 - $\log(\sin^{-1}x)$
 - $\log(\cot^{-1}x)$
 - x^x
- State Rolles theorem. Interpret the statement geometrically. Verify the Rolles theorem for $f(x) = \sin 2x$ in $[0, \pi]$.
- Verify the Rolles theorem for the followings:
 - $y = f(x) = x(x - 3)^2$ in $[0, 1]$
 - $f(x) = \sqrt{25 - x^2}$, $x \in [-5, 5]$
- State mean value theorem. Give its geometrical meaning. Also verify the mean value theorem for $f(x) = 3x^2 - 2x$ in $[1, 3]$.
- Using Lagrange's mean value theorem, find the point on the curve $f(x) = x(x - 2)$, the tangent at which is parallel to take chord joining the points $(1, -1)$ and $(4, 8)$.
- Evaluate the integral:
 - $\int \operatorname{cosec} x dx$
 - $\int \sec x dx$
 - $\int \frac{dx}{a + b \cos x}$ (i) $a < b$, (ii) $b > a$
 - $\int \frac{dx}{3 - \cos x}$
 - $\int \frac{dx}{2 \sin x + 3 \cos x}$
 - $\int \frac{\sin 2x}{(\sin x + \cos x)^2} dx$
 - $\int \frac{dx}{1 + \sin x + \cos x}$
 - $\int \frac{dx}{1 + 2 \sin x}$
 - $\int \frac{\tanh x dx}{\cosh x + 64 \operatorname{sech} x}$
 - $\int \frac{dx}{4 + 3 \sinh x}$