Date:

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Sec: B

Subject: Probability

Date:_____

Q1

Compute and analyse the result of least regretion and co-efficient of co-relation of Y on X

SOLUTION:

X	Y	XY	X^2	Y^2
53	20	1060	2809	400
62	32	1984	3844	1024
57	45	2565	3249	2025
71	60	4260	5041	3600
78	80	6240	6054	64[illegible]0
88	100	8800	7744	10000
86	120	10320	7396	14400
87	140	12180	7596	19600
96	160	15360	9216	25600
91	180	16360	8281	32400
94	200	19800	8836	40,000
94	210	11980	8836	44100
$\Sigma Y = 957$	$\Sigma Y 1347$	$\Sigma x 711020$	$\Sigma X^2 78902$	ΣY^2 199549

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$$y = a + bx \quad \text{— (a)}$$

$$= \bar{y} - b\bar{x} \quad \text{— (b)}$$

$$\bar{y} = \frac{\Sigma y}{n} = \frac{1347}{12} = 112.25 \quad \text{(c)}$$

$$\bar{x} = \frac{\Sigma x}{n} = \frac{957}{12} = 79.57$$

where

$$b = \frac{n\Sigma xy - \Sigma x \Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$$

$$b = \frac{12(109229) - (957)(1347)}{12(78905) - (957)^2}$$

$$b = \frac{21669}{31211}$$

$$b = 0.69$$

Date:

$$a = \bar{y} - b\bar{x}$$

$$112.25 - 0.69(79.57)$$

$$a = 57.34$$

(ii) Co-efficient of co-relation

$$r = \frac{n(\Sigma xy) - \Sigma x \Sigma y}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2}}$$

$$\frac{12(110209) - (957)(1347)}{\sqrt{[12(78902) - (957)^2][12(199549) - (1347)^2}}$$

$$r = 0.000015$$

Date:

Question 2(a)

A box contain 4 red, 4 white & 5 green - - -

(i) all of different colour
(ii) all of same colour

Solution:

$$n(s) = \binom{13}{3} = 286$$

Let

A = Denote all of different colour

$$n(A) = \binom{4}{1}\binom{4}{1}\binom{5}{1} = 4 \times 4 \times 5 = 80$$

$$P(A) \quad \frac{n(A)}{n(s)} = \frac{80}{286} = 0.28$$

28% chance all will be different

Note:

B all denote same colour

$n(B) = \binom{4}{3}$ or $\binom{4}{3}$ or $\binom{5}{3}$

$\binom{4}{3} + \binom{4}{3} + \binom{5}{3} = 4 + 4 + 10 = 18$

$P(B) = \frac{18}{286}$ 0.063

6.3% Chance all are same

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Q2 Part (b)

12 eggs in a refrigerator - - -

(i) exactly one is bad

(ii) at least one is bad

SOLUTION:

$$n(S) = \binom{12}{4} = 495$$

A = Denote only one is bad

$$= \binom{2}{1}\binom{10}{3} = 2 \times 120 = 240$$

$$P(A) \quad \frac{240}{495} = 0.48$$

48% Chance

Let

B = at least one is bad

$$= \binom{2}{1}\binom{10}{3} + \binom{2}{2}\binom{10}{2}$$

$$= 285$$

$$P(B) = \frac{n(B)}{n(S)}$$

$$= \frac{285}{495} = 0.58$$

58% chance at least one is bad

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Q.NO3

following are the score made by batsman A, B and C.

A	12	15	6	73	7	88	199	36	84	29
B	47	12	76	48	4	88	37	48	13	34
C	15	23	52	4	24	88	74	52	13	4

Find range of A, B and C.
Who is more consistant
Compare A with B, B with C and A with C

SOLUTION:

Date:_____

A	B	C
12	47	15
15	12	23
6	76	52
73	48	4
87	4	24
88	88	88
199	37	74
36	48	52
84	13	13
29	3	4

Range $= X_m - X_0$

Range of A $= X_m - X_0$

$= 199 - 6$

$= 193$

Range of B = $x_m - x_o$

= 88 - 3

= 85

Range of C = $x_m - x_o$

= 88 - 4

= 84

Batsman A		Batsman B		Batsman C	
X	X^2	Y	Y^2	Z	Z^2
12	144	47	2209	15	225
15	225	12	144	23	529
6	36	76	5776	52	2704
73	5329	48	2304	4	16
7	49	4	16	24	576
88	7744	88	7744	88	7744
199	39601	37	1369	74	5476
36	1296	48	2304	52	2704
84	7056	13	169	13	169
29	841	3	9	4	16
$\Sigma x = 549$	$\Sigma x^2 = 63321$	$\Sigma Y = 376$	$\Sigma Y^2 = 22044$	$\Sigma z = 349$	$\Sigma z^2 = 20159$

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Batsman A=

$$\bar{x} = \frac{\Sigma x}{n} \qquad \because n = 10$$

$$= \frac{549}{10} = 54.9$$

$$S_x = \sqrt{\frac{\Sigma x^2}{n} - \left(\frac{\Sigma x}{n}\right)^2}$$

$$= \sqrt{\frac{62321}{10} - \left(\frac{549}{10}\right)^2}$$

$$S_{\bar{x}} = 56.72$$

$$C.V = \frac{56.72 \times 100}{\bar{x}} = \frac{56.72}{54.9}$$

$$C.V = 1.03 \times 100$$

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C.V = 103.31

Batsman B

$$Y = \frac{\Sigma Y}{n} = \frac{376}{10} = 37.6$$

$$S_Y = \sqrt{\frac{\Sigma Y^2}{n} - \left(\frac{\Sigma Y}{n}\right)^2}$$

$$= \sqrt{\frac{22044}{10} - \left(\frac{376}{10}\right)^2}$$

$$= \sqrt{2204.4 - 1413.76}$$

$$= 28.11$$

$$C.V = \frac{28.11}{37.6} \times 100$$

$$= 74.76\%$$

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Batsman C :

$$\bar{z} = \frac{\Sigma z}{n} = \frac{349}{10} = 34.9$$

$$S_z = \sqrt{\frac{\Sigma z^2}{n} - \left(\frac{\Sigma z}{n}\right)^2}$$

$$= \sqrt{\frac{20159}{10} - \left(\frac{349}{10}\right)^2}$$

$$= \sqrt{2015.9 - 1218.01}$$

$$\sqrt{797.9}$$

$$= 28.24$$

C.V $\quad \frac{S_z}{\bar{z}}$

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$= \frac{28.24}{34.9} \times 100$

$= 80.91$

Batsman B is more consistant as it value of co-efficient of varience is smallest

Compare A with B

B is consistant

Compare B with C

B is more consistant

Compare A with C

C is more consistant