(1)

Q1 Answer. (A)

X	X	X^2	X^2	XY
3	25	9	625	75
4	24	16	576	96
5	20	25	400	100
6	20	36	400	120
7	19	49	361	133
8	17	64	289	136
9	16	81	256	144
10	13	100	169	130
11	10	121	100	110
12	8	144	64	96
75	172	645	3246	1140

$N = 10, \Sigma x = 75, \Sigma y = 172$

$\Sigma x^2 = 645$

$\Sigma y^2 = 3246, \Sigma xy = 1140$

Substatu in the competing fromie a given gives

$R = \Sigma xy - [(\Sigma x)(\Sigma 17] / N$

(2)

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

$$r = \frac{1140 - \left[(75)(172)\right]/10}{\sqrt{\left[645 - \frac{(75)^2}{10}\right]\left[3246 - \frac{(172)^2}{10}\right]}}$$

$$r = \frac{1140 - 1290}{\sqrt{\{645 - 5625/10\}\{3246 - 2958\}}}$$

$$= \frac{-150}{(82.5)(2876)}$$

$$= \frac{-150}{23727}$$

$$= -0.01 \text{ Ans}$$

Q1 part (B)

Determind the equation of the lost regurment line: of you x and x and y

x	y	x^2	y^2	xy
20	5	400	25	100
11	15	121	225	165
15	14	225	196	210
10	17	100	289	170
17	8	289	64	136
18	9	324	81	162
21	12	441	144	252
25	18	625	256	450
28	18	784	324	504
165	124	3209	1604	2099

Regression line y on x

(4)

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

$$B = \frac{9(2099) - (165)(124)}{9(3309 - (665)^2}$$

$$B = \frac{18891 - 20460}{29781 - 27225}$$

$$B = \frac{1569}{2556}$$

$$\boxed{b = -0.6}$$

$$a = \frac{\Sigma y - b\Sigma x}{n}$$

$$a = \frac{124 - (-0.6)(165}{9}$$

$$= \frac{124 - (-99)}{9}$$

1

Q2 part (B)

x = 20, 11, 15, 25, 28 + 77

y = 5 15 9, 17, 16 18 7

~~x 20 11 15 10 16 17 18~~

20 11 15 10 10 17 18 21 25 18

5 15 14 14 17 17 8 9 16 18

y	x	xy	x^2
5	20	100	400
15	11	165	121
14	15	210	225
17	10	170	100
8	17	136	289
9	18	162	324
12	25	252	441
18	28	504	625
18	28	504	784
114	165.	2099	3,30

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

②

$$b = \frac{9 \times 2,099 - 165 \times 114}{9 \times 3307 - (165)^2}$$

$$B = \frac{81}{2556} \Rightarrow 0.0316$$

$$\bar{x} = \frac{\Sigma x}{n} = \frac{165}{9} = 18.33$$

$$\bar{y} = \frac{\Sigma y}{n} = \frac{114}{9} = 12.66$$

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

$$a = 12.66 - 0.0316 \times 18.33$$

$$a = 12.66 - 0.579$$

$$a = 12081$$

The estimat regression modle.

$$\hat{y} = a + bx$$

$$y = 12.08 + 0.0316x$$

prediction of y when x =

(3)

predication of y when x =

20 + 11 + 15 + 25 + 28 = 99

$\hat{y} = 12.081 + 0.0316(99)$

$\hat{y} = 12.081 + 3.128$

$y = 15.209$

(5)

$$= \frac{124 - (-99)}{9}$$

$$\boxed{a = 24 - 7}$$

hence the requirment regression line is given by

$$\underline{\hat{y} = a + bx}$$

$$= \hat{y} = 24.7 - 0.6x$$

Regression line x on y

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

$$b = \frac{9(2099) - (165)(124)}{9(1604) - (124)^2}$$

Ans part (A)

6

$$b = \frac{18891 - 20460}{14436 - 15376}$$

$$b = \frac{+1569}{+940}$$

$$\boxed{b = 1.7}$$

$$a = \frac{\Sigma x - b\Sigma y}{N}$$

$$= \frac{165 - (1.7)(124)}{9}$$

$$a = \frac{165 - 210.8}{9}$$

$$a = \frac{45.8}{9}$$

$$\boxed{a = -5.1}$$

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(1)

hence the reguiment line is given

$\hat{X} = a_1 + by$

$$\hat{X} = -5.1 + 1.7y$$

Q No 1 Part (B)

(B) Find the predicate value of y for x = 20, 11 - 15, 25, 28 and x for y = 5, 15, 9, 12, 16, 18

$\hat{y} = 24.7 - 0.6x$

$\hat{x} = -5.1 + 1.7y$

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x	y	$\hat{y} = 24.7 - 0.06x$	$\hat{x} = -5.1 + 1$
10	5		
11	15	12.7	3.4
15	9	18.1	20.4
25	12	15.7	10.2
28	16	9.7	15.2
	18	7.5	22.1
			25

This is predical valu

Q:03 <u>Ans</u> part (A)

(Give Data)

2	6	1	5	4	3	3	8	10	1
4	3	3	0	5	2	1	4	10	3
5	3	3	0	3	3	2	2	7	4
1	4	2	4	4	4	6	8	10	7
7	5	6	5	3	2	3	9	2	2

Uncomperd frequency distribuation -

No	Tallymark	frequency	Comulation-
0	|	1	1
1	||||	4	5
2	~~||||~~ |||	8	13
3	~~||||~~ ~~||||~~ |	11	24
4	~~||||~~ |||	8	32
5	~~||||~~	5	37
6	||||	4	41
7	|||	3	44
8	||	2	46
9	|	1	47
10	|||	3	50

②

Q3 Ans part (B)

Given Information of children born to 50 women.

2	6	1	5	1	3	3	8	10	1
4	3	3	0	5	7	1	4	10	3
5	3	3	6	3	3	2	2	7	4
1	4	2	4	4	4	6	8	10	7
7	5	6	5	3	2	3	9	2	2

Gound frequency Distribution for given Data.

$N = 50$

③

Range $= X_m - X_o$

$R = 10 - 1 = \boxed{9}$

$K = 1 + 3\cdot3 \log N$

$= 1 + 3\cdot3 \log (50)$

$1 + 3\cdot3 (1\cdot698)$

$= 1 + 5\cdot6066$

$K = 6\cdot606 = \boxed{6}$

$H =$ class Intervel $= \frac{\text{Rang}}{K}$

$h = \frac{9}{7} = 1\cdot285 = \boxed{2}$

we findout the information frame Data -

$N = 50, \; R = 9, \; K = 6,$
$H = 2$

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(4)

Classes	Freqancy	Class boundary	Midpoint
0 - 1	5	-0.5 - 1.5	1
2 - 3	19	1.5 - 3.5	2.5
4 - 5	13	3.5 - 5.5	4.5
6 - 7	7	5.5 - 9.5	8.5
8 - 9	3	7.5 - 9.5	8.5
10 - 11	3	10.5 - 11.5	11

Total 50

R. frequency	R. freqency %	C.F	R.C.F
5/50	5/50 × 100 = 10	5	5/50 = 0·
19/50	19/50 × 100 = 38	24	24/50 = 0·
13/50	13/50 × 100 = 26	37	37/50 = 0
7/50	7/50 × 100 = 14	44	44/50 = 0
3/50	3/50 × 100 = 6	47	47/50 = 0
3/50	3/50 × 100 = 6	50	50/50 =

part (B) Q no3 Complete.

Q2 = part A

=> A Fair coin is tossed 5 times. Find the probabilites of obtaining various number of head.

Lets regured the tossing of a coin as an experment. Then we observed that.

(1) Each toss of coin has two possable outcom.

(2) The probability of head (Success) is $p = 1/2$ and Remain the same for Successive tosses.

(3) The Successive tosses of the coin are Independent.

(4) The coin is tossed 5 times.

Therefore the R.V X which denote the number of head (Successes) has a binamal probability

②

distribuation with $p = \frac{1}{2}$ and $n = 5$ the possable value of x are 0, 1, 2, 3, 4 and 5 hence

$$P(\text{no head}) = P(x=0) = \binom{5}{0}\left(\frac{1}{2}\right)^0\left(\frac{1}{2}\right)^5$$

$$= 1 \times \left(\frac{1}{2}\right)^5 = \frac{1}{32}$$

$$P(1\text{ head}) = P(x=1) = \binom{5}{1}\left(\frac{1}{2}\right)^1\left(\frac{1}{2}\right)^{5-1}$$

$$= 5 \times \left(\frac{1}{2}\right)^5 = \frac{5}{32},$$

$$P(2\text{ head}) - P(x-2) - \binom{5}{2}\left(\frac{1}{2}\right)^2\left(\frac{1}{2}\right)^{5-2}$$

$$= 10 \times \left(\frac{1}{2}\right)^5 = \frac{10}{32},$$

$$P(3\text{ head}) = P(x=3) - \binom{5}{3}\left(\frac{1}{2}\right)^2$$

$$\left(\frac{1}{2}\right)^{5-3} = 10 \times \left(\frac{1}{2}\right)^5 = \frac{10}{32}$$

(3)

$P(4 \text{ head}) = P(X=4) = \left[\binom{5}{4}\right]\left(\frac{1}{2}\right)^4$
$\left[\frac{1}{2}\right]^{5-4} = 5 \times \left[\frac{1}{2}\right]^5 = \frac{5}{32}$, and

$P(\text{heads}) = P(X=5) = \left[\binom{5}{5}\right]\left(\frac{1}{2}\right)^5$
$\left[\frac{1}{2}\right)^0 = 1 \times \left[\frac{1}{2}\right]^5 = \frac{1}{32}$

These probability can also be obtain by expanding the Bionamial $\left(\frac{1}{2} + \frac{1}{2}\right)^5$.

The Bionamial P.d for a number of head obtained in 5 tosses of fair coin is

X	0	1	2	3	4	5
f(X)	$\frac{1}{32}$	$\frac{5}{32}$	$\frac{10}{32}$	$\frac{10}{32}$	$\frac{5}{32}$	$\frac{1}{32}$

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(1)

Q2 part (B)

Solution here
there Jrase the Bionamel
porbability with wide

$n = 10$

$P = 2/3$

$q = 1 - P$

$q = 1 - 2/3$

$q = \frac{1}{3}$

let x denate the
number of noun by
IA then-

(i) $P(x>4) = 1 - P(x \leq 4$

$= 1 - \sum_{x=0}^{8} \binom{10}{x} \left(\frac{2}{3}\right)^{x} \left(\frac{1}{3}\right)^{10-x}$

$= 1 - \{ \left(\frac{1}{3}\right)^{10} + 10 \left(\frac{2}{3}\right)^{1}$

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$\left(\frac{1}{3}\right)^{9} + 45\left(\frac{2}{3}\right)\left(\frac{1}{3}\right)^{8}$
$+ 120\left(\frac{2}{3}\right)^{3}\left(\frac{1}{3}\right)^{7}\}$

$= 1 - \frac{1}{59049}\{1 + 20 + 180 + 960\}$

$1 - 0.0197$

$P(x \geq 4) = 0.9803$

(ii) $P(x = 4) = \binom{10}{4}\left(\frac{2}{3}\right)^{4}\left(\frac{1}{3}\right)^{6}$

$= 210\left(\frac{16}{81}\right)\left(\frac{1}{729}\right)$

$= \frac{3360}{59049}$

$P = (X = 4) = 0.056$

(iii) $P(X = 11) = 0(0)$ = because X can take only value

$0, 1, 2, 3, \ldots 10$

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3

6 or more games

$$P(X=6) = \sum_{x=6}^{10} \binom{10}{x} \left(\frac{2}{3}\right)^{x} \left(\frac{1}{3}\right)^{n-x}$$

$$= \binom{10}{6}\left(\frac{2}{3}\right)^{6}\left(\frac{1}{3}\right)^{4} + \binom{10}{7}\left(\frac{2}{3}\right)^{7}\left(\frac{1}{3}\right)^{3} +$$

$$+ \binom{10}{8}\left(\frac{2}{3}\right)^{8}\left(\frac{1}{3}\right)^{2} + \binom{10}{9}\left(\frac{2}{3}\right)^{9}\left(\frac{1}{3}\right)^{1}$$

$$+ \binom{10}{10}\left(\frac{2}{3}\right)^{10}\left(\frac{1}{3}\right)^{0}$$

$$P = 0.228 + 0.261 + 0.196$$

$$+ 0.087 + 0.018$$

$$P = (x \geq 6) = 0.79$$

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