Name : Sajjad Ahmad

ID : 113638

Programe : Bs (DT)

Instructor : Sir Anwar Shamim

Date : 22/6/2020

paper : Bio-State

Semester : 6th

Exame : Final 2020

No: (1) Date: 22-june 2020

Q.3

(a) Frequency distribution of grouped data

⇒ Largest no − Smallest no

$10 - 0 = 10 / 6 = 1.6$

Groups	Entries	f
0 − 1	0, 1, 1, 1, 1	5
2 − 3	2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3	19
4 − 5	4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5, 5	13
6 − 7	6, 6, 6, 6, 7, 7, 7,	7
8 − 9	8, 8, 9	3
10 − 11	10, 10, 10	3
		= 50

data

(b) Ungrouped frequency distribution:

n	f
0	1
1	4
2	8
3	11
4	8
5	5
6	4
7	3
8	2
9	1
10	3
	= 50

$$\boxed{\sum f = 50}$$

No: (2) Date: 22 June 2020

Q.2 (a)

tossing of a a coin as an experiment. We know that.

(i) Each toss of a coin has two possible outcomes, heads and tails

(ii) the probability of a head is $p = 1/2$ and remains the same for successive tosses:

(iii) the successive tosses of the coin are independent

(iv) the coin is tossed 5 times

X denotes the numbers of the heads

→ the possible value of X are 0, 1, 2, 3, 4, 5.

Hence

$$P(\text{no head}) = P(X=0) = \binom{5}{0}\left(\frac{1}{2}\right)^0\left(\frac{1}{2}\right) = 1\times\left(\frac{1}{2}\right)^5 = \frac{1}{32}$$

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

$$P(\text{2 head}) = P(X=2) = \binom{5}{2}\left(\frac{1}{2}\right)^2\left(\frac{1}{2}\right)^{5-2} = 10\times\left(\frac{1}{2}\right)^5 = \frac{10}{32}$$

$$P(\text{3 head}) = P(X=2) = \binom{5}{3}\left(\frac{1}{2}\right)^3\left(\frac{1}{2}\right)^{5-3} = 10\times\left(\frac{1}{2}\right)^5 = \frac{10}{32}$$

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

P.T.O

No: (3) Date: 22 June - 2020

$$P = (5 \text{ head}) = P(n=5) = \binom{5}{5}\left(\frac{1}{2}\right)^5\left(\frac{1}{2}\right)^0 = 1 \times \left(\frac{1}{2}\right)^5 = \frac{1}{32}$$

These probability can also be obtained by expending the binomial $(1/2 + 1/2)^5$. The binomial probability distribution for the number of heads obtained in 5 tosses of a fair coin is

n	0	1	2	3	4	5
$f(n)$	1/32	5/32	10/32	10/32	5/32	1/32

(B)

Therefore the Binomial probability distribution

$n = 10$

$P = 2/3$

$q = 1 - P$

$q = 1 - 2/3$

$q = 1/3$

X denote the number of won by A then

(i) $P(X \geq 4) = 1 - P(X < 4)$

No: (4) Date: 22 June 2020

$$1 - \sum_{x=0}^{3} \binom{10}{x} \left(\frac{2}{3}\right)^x \left(\frac{1}{3}\right)^9 + 45\left(\frac{2}{3}\right)^2\left(\frac{1}{3}\right)^8 + 120\left(\frac{2}{3}\right)^3\left(\frac{1}{3}\right)^7$$

$$1 - \frac{1}{59049}\left[1 + 20 + 180 + 960\right]$$

$$1 - 0.0197$$

$$\boxed{P(x \geq 4) = 0.9803}$$

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

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

$$= \frac{3360}{59049}$$

$$\boxed{P(x=4) = 0.056}$$

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

0, 1, 2, 3 ---- 10

(iv) (5)

6 or more games

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

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

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

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

$$= 0.228 + 0.261 + 0.196 +$$

$$0.087 + 0.018$$

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

No: Date:

Q: 1

(a) Correlation of X - Y

x	y	x^2	y^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
13	8	169	64	104
$\Sigma x = 76$	Σy	$\Sigma x^2 = 670$	$\Sigma y^2 = 3240$	$\Sigma xy = 1148$

$\Sigma y = 172$

$n = 14$

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

$$r = \frac{14(1148) - (76)(172)}{\sqrt{[14(670) - (76)^2][14(3240) - (172)^2]}}$$

$$= \frac{16072 - 13072}{\sqrt{(9380 - 5776)(45,360 - 29,584}}$$

$$r = \frac{3000}{\sqrt{(3604)(15776)}} = \frac{3000}{7540}$$

$$r = 0.39$$

No: 7 Date:

(B)

x	y	x^2	xy
20	5	400	100
11	15	121	165
15	14	225	210
10	17	100	170
17	8	289	136
18	9	324	162
21	12	441	252
25	16	625	400
28	18	784	504
$\Sigma x = 165$	$\Sigma y = 114$	$\Sigma x^2 = 3309$	$\Sigma x = 2099$

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

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

$$b = \frac{9(2099) - (165)(114)}{\sqrt{9(3309) - (165)^2}}$$

$$b = \frac{18,899 - 18810}{\sqrt{271781 - 271225}}$$

$$b = \frac{81}{\sqrt{556}} = \frac{81}{23}$$

No: (9) Date: 22-6-2020

$b = 3.52$

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

$= \frac{114}{9} - 3.52\left(\frac{165}{9}\right)$

$a = 12.66 - (3.52)(18.33)$

$a = -51.86$

$\hat{y} = a + bx$

$= -51.86 + bx = -51.86 + 3$

$n = 20$

$\hat{y} = -51.86 + 3.25 \times 20$

$\hat{y} = 18.53$