· PROBABILITY ·

MID'S ASSIGNMENT

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SEM : Bs (CS) 4th
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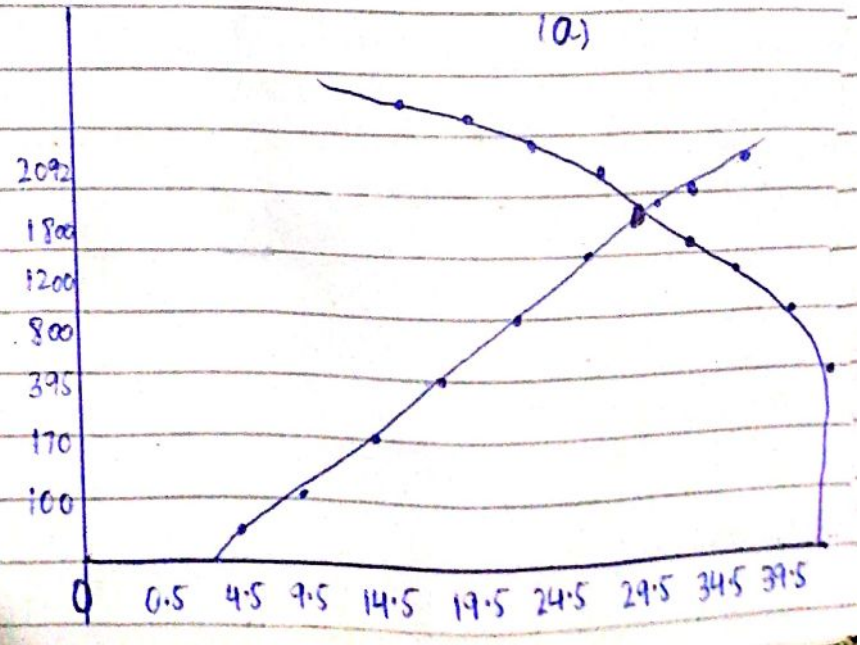
· Q1 ·

:-

CLASS	f	C·B	C·f<	C·f >
0-4	25	4.5	25	2092
5-9	45	4.5-9.5	70	2067
10-14	81	9.5-14.5	151	2022
15-19	143	14.5-19.5	294	1941
20-24	280	19.5-24.5	574	1798
25-29	349	24.5-29.5	923	1518
30-34	374	29.5-34.5	1297	1669
35-39	395	34.5-39.5	1692	795
40-44	400	39.5-44.5	2092	400

CB = A = LCL of 2nd class - UCL of first
= 5-4
= 1/2
CB = 0.5



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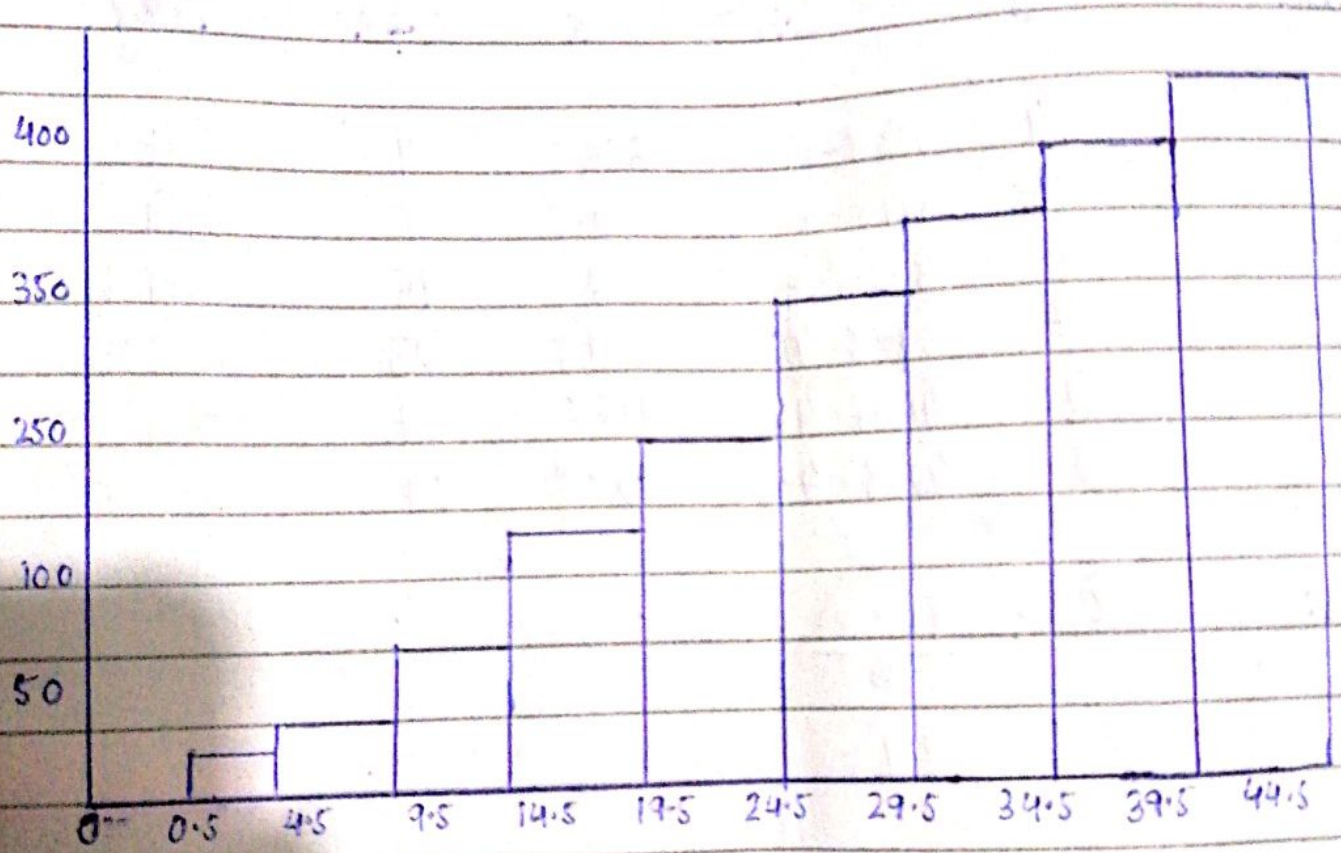
(b)



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Q2.

:-

N = 30
X_m = 431
X_o = 363

Range:-

$R = X_m - X_o$
$R = 431 - 363$
$R = 68$

No of classes:-

$K = 1 + 3.33 \log(N)$
$K = 1 + 3.33 \log(30)$
$K = 1 + 3.33 (1.47)$
$K = 5.92$
$K = 6$

$h = R/K = \frac{68}{6}$

$h = 11.33 \approx 12$

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CLASSES	f	C·B	x	Cf<	Tally
363-374	4	362·5-374·5	368·5	4	IIII
375-386	4	374·5-386·5	380·5	8	IIII
387-398	8	386·5-398·5	392·5	16	IIIIIIII
399-410	7	398·5-410·5	404·5	23	IIIIII
411-422	4	410·5-422·5	416·5	27	IIII
423-434	3	422·5-434·5	428·5	30	III

MEAN: $\bar{X} = \frac{\Sigma f_i \cdot x_i}{n}$

$\bar{X} = \frac{11919}{30}$

$\bar{X} = 397.3$

MODE:

$M = l_1 + \frac{f_1 - f_0}{2 \cdot f_1 - f_0 - f_2} \cdot (l_2 - l_1)$

$M = 386.5 + \frac{8-4}{2(8)-4-7} \cdot (398.5 - 386.5)$

$= 386.5 + \frac{4}{16-11} \cdot (12)$

$= 386.5 + \frac{4}{5} \cdot (12)$

$= 386.5 + 9.6$

$M = 396.1$

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QUARTILES :

$$q_1 = \frac{n}{4}$$

$$q_1 = \frac{30}{4} = 7.5$$

$$Q_1 = l + h/f\ (q_1 - c)$$

$$Q_1 = 374.5 + 12/4\ (7.5 - 4)$$

$$Q_1 = 374.5 + 3\ (3.3)$$

$$Q_1 = 374.5 + 10.5$$

$$Q_1 = 385.$$

$$q_3 = 3n/4$$

$$= \frac{3(30)}{4}$$

$$= 90/4$$

$$q_3 = 22.5$$

$$Q_3 = l + h/f\ (q_3 - c)$$

$$Q_3 = 398.5 + \frac{12}{7}\ (22.5 - 16)$$

$$Q_3 = 398.5 + 12/7\ (6.5)$$

$$Q_3 = 398.5 + 11.14$$

$$Q_3 = 409.64$$

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Q3.

FIRST SET: 3, 6, 2, 1, 7, 5

$$\text{Mean} = \frac{\text{Sum of all numbers}}{\text{Total numbers}}$$

$$M = 24/6 = 4$$

$$S.D = \sqrt{\frac{\Sigma x_i^2}{N} - \left(\frac{\Sigma x_i}{N}\right)^2}$$

x	x^2
24	124

$$S.D = \sqrt{\frac{124}{6} - \frac{576}{36}}$$

$$S.D = \sqrt{\frac{744 - 576}{36}}$$

$$S.D = \sqrt{\frac{168}{36}}$$

$$S.D = 2.16$$

SECOND SET: 11, 17, 9, 7, 19, 15

$$M = 78/6 = 13$$

$$SD = \sqrt{\frac{672}{36}}$$

$$SD = \sqrt{18.67}$$

$$SD = 4.32$$

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Q4.

CLASS	f	x	x^2	fix	fix^2
64-84	15	74	5476	1110	84,120
85-104	18	94.5	8930.25	1701	160,744.5
105-124	27	114.5	13110.25	3091.5	335976.75
125-144	10	134.5	18090.25	1345	180902.5
145-164	6	154.5	23870.25	927	143221.5
163-184	5	174.5	30450.25	872.5	152251.25
185-204	13	194.5	37830.25	2528.5	491793.25

Now, (S^2)

as $$S^2 = \frac{\Sigma fx^2}{n} - \frac{(\Sigma fx)^2}{n}$$

$$= \frac{7565029.75}{94} - \left(\frac{1575.5}{94}\right)$$

$$S^2 = 16649.25 - 15164.35$$

$$S^2 = 1484.9$$

by root on b.s

$$\sqrt{S^2} = \sqrt{1484.9}$$

$$S = 38.5$$

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·Q5·

→ Comment on the following sentences :-

(a)

→ As with what we have here, we know that the depth of the river is not uniform here maybe its of 2ft height at the start and 7ft in the middle and so on, So there are chances that the person may not be able to cross the river and will most probably drown.

→ There can be several aspects to it for us to study first for understanding the situation.

(i) If the person knows how to swim or not.
(ii) The flow of the water, maybe.
(iii) Are there other people who can save him if it goes wrong

→ If he knows how to swim, he maybe cross the river without any difficulty but if he don't know how to swim he may drown if there is no one around for help.

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Q5 (b)

→ Here we know that the average of a class students is 30 marks, so i think all of them are not hopeless some may have passed the exam

→ But most have failed and thats obvious, but not all some students cleared while most of them have failed.

Q5 (c)

→ The average income of a king is 20,000 so all must be fabulously paid, I think not. If the king has a lavish life style for himself so he may not pay everyone equally.

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