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Department	BSCS
Semester	4th
Paper	Probability and Statistics

:: Question 1::

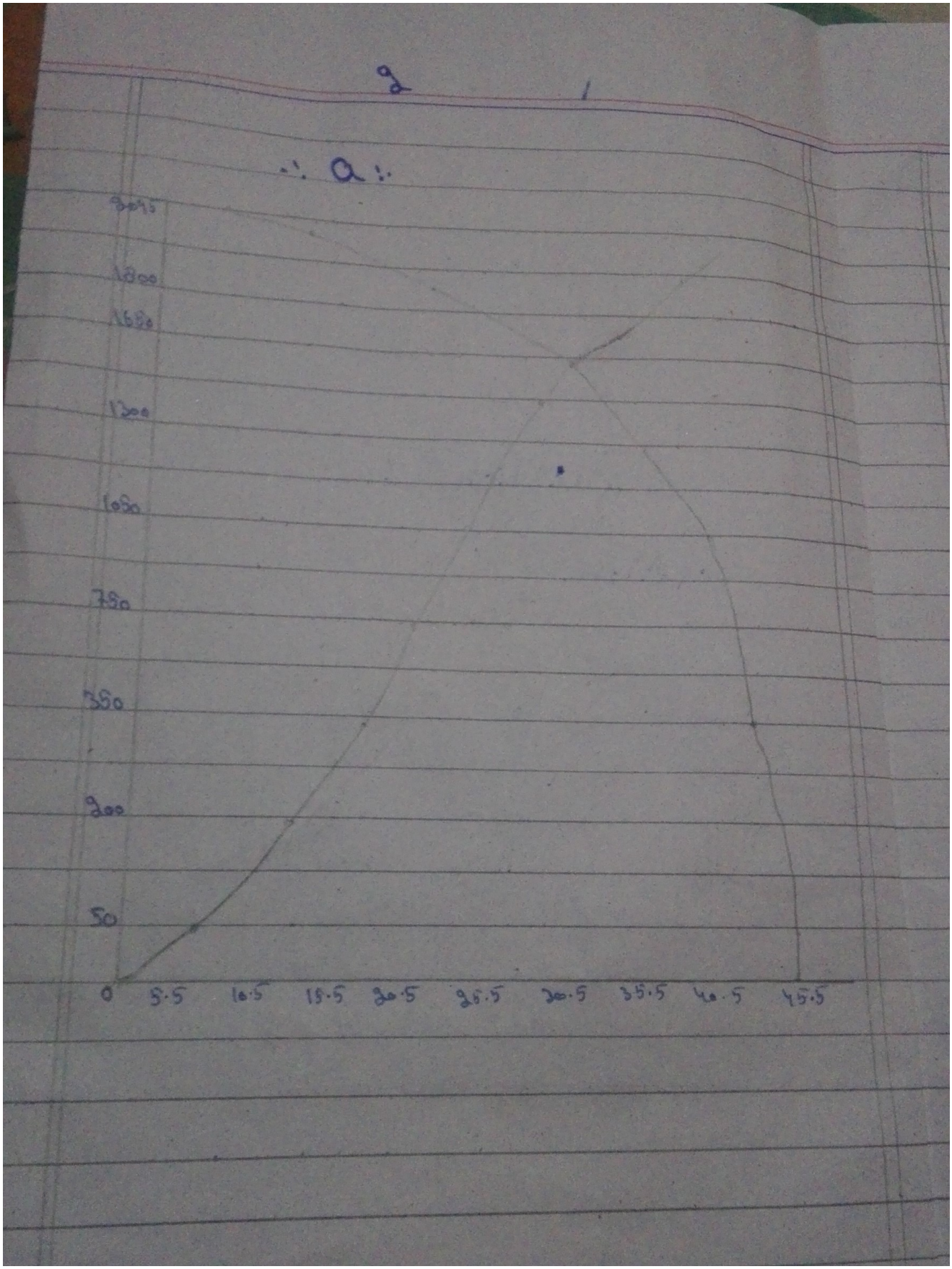
Solution::

Classes	f	C.B	cf<	cf>
0-5	25	0-5.5	25	2098
5-10	45	5.5-10.5	70	2067
10-15	81	10.5-15.5	151	2023
15-20	143	15.5-20.5	294	1941
20-25	280	20.5-25.5	574	1798
25-30	349	25.5-30.5	923	1518
30-35	374	30.5-35.5	1297	1169
35-40	395	35.5-40.5	1692	795
40-45	400	40.5-45.5	2092	400

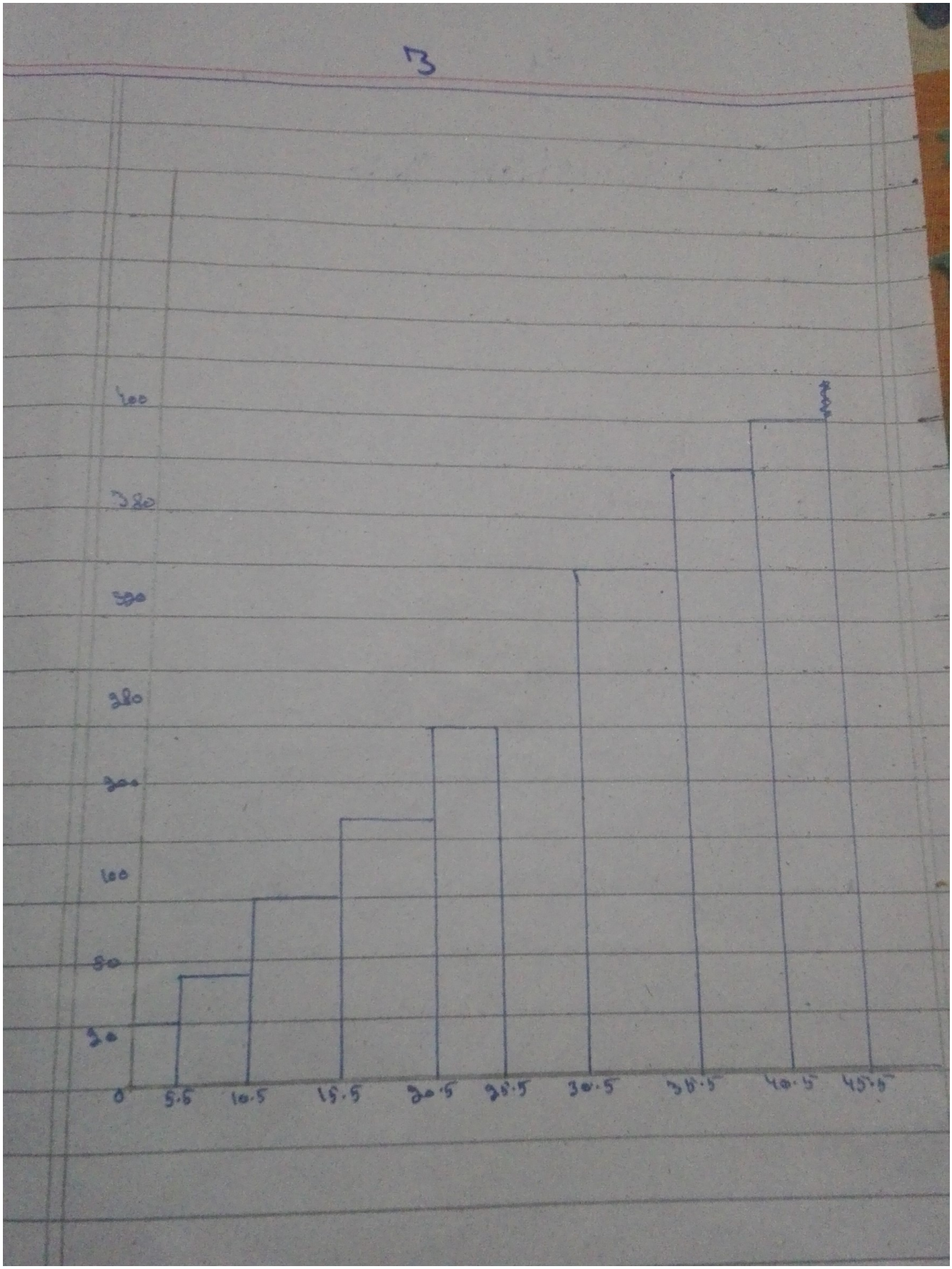
C.B = LCL of 2nd Class - UCL of 1st Class

C.B = 5.5 - 5.5

C.B = 0


2
1
∴ Q :
1800
1680
1200
1080
780
380
200
50
0
5·5
10·5
15·5
20·5
25·5
30·5
35·5
40·5
45·5

13


400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
5.5
10.5
15.5
20.5
25.5
30.5
35.5
40.5
45.5

Question

Solution:-

$N = 30$

$x_m = 431$

$x_o = 363$

Range:-

$R = x_m - x_o$

$R = 431 - 363$

$R = 68$

No of Classes:-

$k = 1 + 3.33 \log(N)$

$k = 1 + 3.33 \log(30)$

$k = 1 + 3.33 (1.47)$

$k = 5.92$

$k = 6$

$h = R/k$

$h = 68/6$

h = 11.33
h = 12

Classes	f	C.B	x	c.f<	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	IIII III
399-410	7	398.5-410.5	404.5	23	IIII IIII
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:-

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

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

(9) (6)

$$M = 386.5 + \frac{4}{16-11} \cdot (19)$$

$$M = 386.5 + \frac{4}{5} \cdot (19)$$

$$M = 386.5 + 9.6$$

$$M = 396.1$$

Quartiles:-

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

$$q_1 = 30/4 = 7.5$$

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

$$Q_1 = 374.5 + 19/4 \ (7.5 - 4)$$

$$Q_1 = 374.5 + 3(3.5)$$

$$Q_1 = 374.5 + 10.5$$

$$\boxed{Q_1 = 385}$$

(7)

$$w_3 = \frac{3n}{4}$$

$$w_3 = \frac{3(30)}{4}$$

$$w_3 = \frac{90}{4}$$

$$\boxed{w_3 = 99.5}$$

$$Q_3 = l + \frac{h}{f}(w_3 - C)$$

$$Q_3 = 398.5 + \frac{12}{7}(99.5 - 16)$$

$$Q_3 = 398.5 + \frac{12}{7}(6.5$$

$$Q_3 = 398.5 + 11.14$$

$$\boxed{Q_3 = 409.64}$$

Question :: 3

First Set :-

3, 6, 9, 1, 7, 5

Mean = Sum of all numbers / total no

$m = \frac{24}{6}$

$\boxed{m = 4}$

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

x	x^2
3	9
6	36
2	4
1	1
7	49
5	25
24	124

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

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

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

$$S.D = \sqrt{4.67} \Rightarrow S.D = \boxed{2.16}$$

(9)

2nd Set:-

11, 17, 19, 7, 19, 15.

Mean = $\frac{76}{6}$

$\boxed{M = 13}$

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

x	x^2
11	121
17	289
9	81
7	49
19	361
15	225
78	1126

$$S.D = \sqrt{\frac{1126}{6} - \frac{6084}{36}}$$

$$S.D = \sqrt{\frac{6756 - 6084}{36}}$$

$$S.D = \sqrt{\frac{672}{36}}$$

$$S.D = \sqrt{18.67}$$

$$S.D = 4.32$$

(10)

first set mean = 4
first set S.D = 2.16
2nd set Mean 13
2nd set S.D = 4.32

Mean and S.D of 2nd set is greater than first set.

(11)

Q 4

Class	f	x	x^2	fix	fix^2
64-84	15	74	5476	1110	82,140
85-104	18	94.5	8930.25	1701	160,744.5
105-124	27	114.5	13110.25	3091.8	353,976.75
125-144	10	134.5	18090.25	1343	180,902.5
145-164	6	154.5	23870.25	927	143,221.5
165-184	5	174.5	30450.25	8725	152,251.25
185-204	13	144.5	37830.25	2598.5	49,791.25
	94			11,575.5	1565 29.75

formula:-

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

$$S^2 = \frac{1565029.75}{94} - \left(\frac{11,575.5}{94}\right)^2$$

$$S^2 = \frac{1565029.75}{94} - \frac{133,992,900.25}{8,836}$$

(12)

$S^2 = 16649.95 - 15,164.35$

$S^2 = 1484.9$

" $\sqrt{}$ on both side

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

$S = 38.54$

Q 5

A) DEPth of River:-

The average depth of the river is 5 feet than it is not obviously that all the people have height 5 feet easily cross it. if he did not know swiming. Important fact is river is not deep uniformly. It is 3 feet at some points while 7 feet on other point. So therefore he will cross.

B) Students:-

No, it does not mean every Student is hopeless There would be Students whose marks are less than 30. While there can be few Students whose marks

C)

might be 60 or more.

C) Average Income:-

No,
it is not like that, Average Pay does not mean everyone get paid same. the king income will be much more than servents.