

Name :-

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ID :-

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Subject :-

Probability and statistics .

Teacher :-

Sir Daud Khan .

FD # 16950

Muhammad Asif

Page # 01

Q NO. 1 Given

Time taken 5 10 15 20 25 30 35 40 45

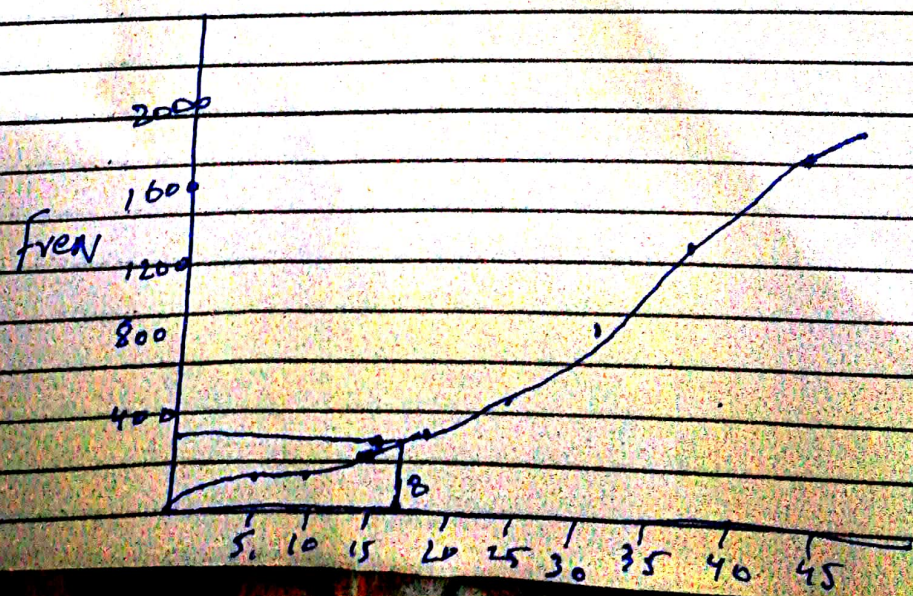
Frequency 25 45 81 143 280 349 374 395 400

To find

* Draw cumulative freq curve

* Constant freq distribution and find histogram
Tables

Time take	freq	cumulative freq curve
$0 < t < 5$	25	25
$5 < t < 10$	45	$25 + 45 = 70$
$10 < t < 15$	81	$25 + 45 + 81 = 151$
$15 < t < 20$	143	$25 + 45 + 81 + 143 = 294$
$20 < t < 25$	280	$25 + 45 + 81 + 143 + 280 = 574$
$25 < t < 30$	349	$574 + 349 = 923$
$30 < t < 35$	374	$923 + 374 = 1297$
$35 < t < 40$	395	$1297 + 395 = 1692$
$40 < t < 45$	400	$1692 + 400 = 2092$



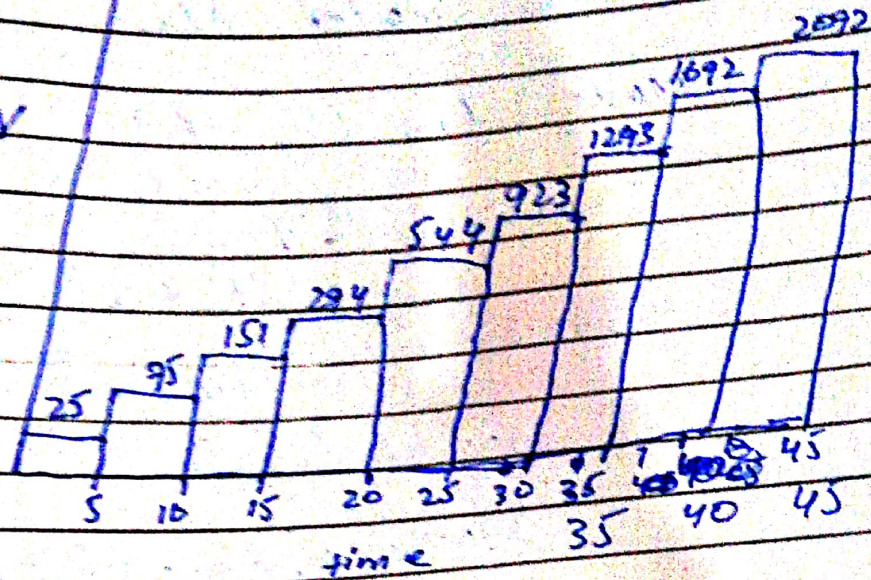
ID # 15750

Muhammad Asif

Page # 01

Histogram

term freq



Q no 2

423, 369, 387, 411, 393, 394, 371, 377, 389, 409
 392, 408, 421, 401, 363, 391, 405, 382, 400
 381, 389, 399, 415, 428, 422, 396, 372
 410, 419, 386, 390

363, 369, 371, 372, 377, 381, 382
 386, 387, 390, 391, 392, 393, 394
 396, 399, 400, 401, 405, 408, 409,
 410, 411, 415, 419, 422, 423, 428, 431

Time	Freq	midpoint	f _x	Class boundaries
360 - 370	2	365	730	359.5 - 370.5
371 - 380	3	375.5	11265	370.5 - 380.5
381 - 390	6	385.5	2313	380.5 - 390.5
391 - 400	7	395.5	2768.5	390.5 - 400.5
401 - 410	5	405.5	2027.5	400.5 - 410.5
411 - 420	8	415.5	1246.5	410.5 - 420.5
421 - 431	4	428.5	1704	420.5 - 430.5
	n = 30	$\sum x = \sum f \cdot x$	11916	
		$\bar{x} = \frac{\sum f \cdot x}{n}$		$\bar{x} = \frac{11916}{30} = 397.2$

ID # 16950

Muhammad Asif

Page # 03

Class 390.5 to 400.5 has max freq. so it is the modal class

$$\text{Mode} = l + h \left(\frac{f_m - f_1}{2f_m - f_1 - f_2} \right)$$

$$390.5 + 11 \left(\frac{7 - 6}{2(7) - 6 - 5} \right)$$

$$390.5 + 11 \left(\frac{1}{14 - 11} \right)$$

$$390.5 + 11 \left(\frac{1}{3} \right)$$

$$390.5 + 3.61 = 394.167 \text{ Ans}$$

Quartiles

$$Q_1 = \left(\frac{n+1}{4} \right)^{\text{th}} \text{ item}$$

$$(7.75)^{\text{th}} \text{ item}$$

$$7^{\text{th}} \text{ item} + \left(\frac{3}{4} \right) 3^{\text{rd}} \text{ item} - 2^{\text{nd}} \text{ item}$$

$$382 + \frac{3}{4} (371 - 369)$$

$$382 + \frac{3}{4}$$

$$383.25$$

$$Q_3 = 3 \left(\frac{n+1}{4} \right)^{\text{th}} \text{ item}$$

$$3 (7.75)^{\text{th}} \text{ item}$$

$$23.25$$

$$23 + \frac{1}{4} [9^{\text{th}} + 10^{\text{th}} \text{ item}]$$

$$23^{\text{th}} \text{ item} + \frac{1}{4} [387 - 386]$$

$$410 + \frac{1}{4}$$

$$Q_3 = 410.25 \text{ Ans}$$

ID # 16950

Muhammad Asif

Page # 84

Date

Q 3

Date

$1-4 = -3$	9	1	7	$7-13 = -6^2$	36	173
$2-4 = -2$	4	2	9	$9-13 = -4^2$	16	426
$3-4 = -1$	1	3	11	$11-13 = -2^2$	4	729
$5-4 = 1$	1	5	15	$15-13 = 2^2$	4	
$6-4 = 2$	4	6	17	$17-13 = 4^2$	16	
$7-4 = 3$	9	7	19	$19-13 = 6^2$	36	

\bar{x}_1	4	f	x
was	$S = 5.6$	3	$2 = 6$
		2	$5 = 10$
		1	$8 = 8$
\bar{x}_2	13		<u>24</u>
$x_2 = 22.4$			4

The mean of set 1 is
 $(\bar{x}_1 \times 2) + 5 = \bar{x}_5$
 and the standard deviation is
 $S_1 \times 4 = S_2$

ID # 16950

Muhammad Asif

Pageth 05

Q4

Data of midpoint interval		x_m	$x_m \cdot f$	x_{mean}	x_{max}	$(x_m - \bar{x})^2$	$(x_m - \bar{x})^2 \cdot f$
64-84	15	74	1110	123.14	-49.14	2415	36225
85-104	18	94.5	1701	123.14	-28.69	820	14760
105-124	27	114.5	3091.5	123.14	8.64	75	2025
125-144	10	134.5	1345	123.14	11.36	129	1290
145-164	6	154.5	927	123.14	31.36	983	5898
165-184	5	174.5	872.5	123.14	51.36	2638	13190
185-204	13	194.5	2528.5	123.14	71.36	5092	66196
	94		11,575.5			12152	139,584

$$s^2 = \sum (x_m - \bar{x})^2 \cdot f$$

$$s^2 = \frac{139,584}{94-1} - 1500.90$$

$$s^2 = 1500.90$$

$$s = \sqrt{1500.90}$$

$$s = 38.74$$

Q5

a) Comment:- "Never forget the 6-foot-tall man who drowned crossing the stream that was 5 feet deep on average."

b) comment:- "The average marks of class is 30 therefore every student is hopeless"

ID# 15950

Muhammad Asif

Page# 06

c) Comment.

The key to this comment is the word "average". There are 3 types of averages, mean, median and mode. They are all regarded as forms of "central tendency" of a set of data.