



IG - Maths
0580

Statistics
Exercise
Paper - 4

Suresh Goel
(Director)
Alliance World School,
Noide, India.

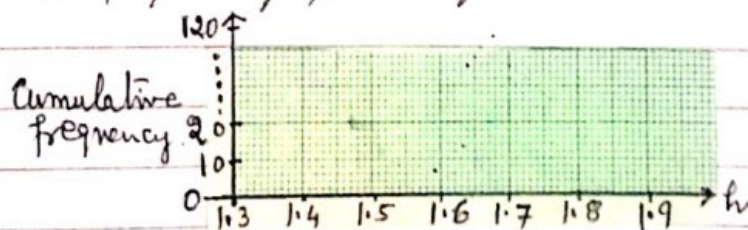
Q1 The table shows information about the heights of 120 girls in a swimming club.

Height (h metres)	Frequency
$1.3 < h \leq 1.4$	4
$1.4 < h \leq 1.5$	13
$1.5 < h \leq 1.6$	33
$1.6 < h \leq 1.7$	45
$1.7 < h \leq 1.8$	19
$1.8 < h \leq 1.9$	6

- (a) (i) Write down the modal class. ---[1]
 (ii) Calculate an estimate of the mean height. Show all your working. --[4]
 (b) Girls from this swimming club are chosen at random to swim in a race. Calculate the probability that:
 (i) the height of the first girl chosen is more than 1.8 metres, ---[1]
 (ii) the heights of both the first and second girl chosen are 1.8 m or less. --[3]
 (c) (i) Complete the cumulative frequency table for the heights,

Height (h metres)	Cum
$h \leq 1.3$	0
$h \leq 1.4$	4
$h \leq 1.5$	17
$h \leq 1.6$	50
$h \leq 1.7$	
$h \leq 1.8$	114
$h \leq 1.9$	

- (ii) draw the cumulative frequency graph on the grid. -- [3]



- (d) Use your graph to find,
 (i) the median height, ---[1]
 (ii) the 30th percentile, -- [1]

SP-15/04/Q3

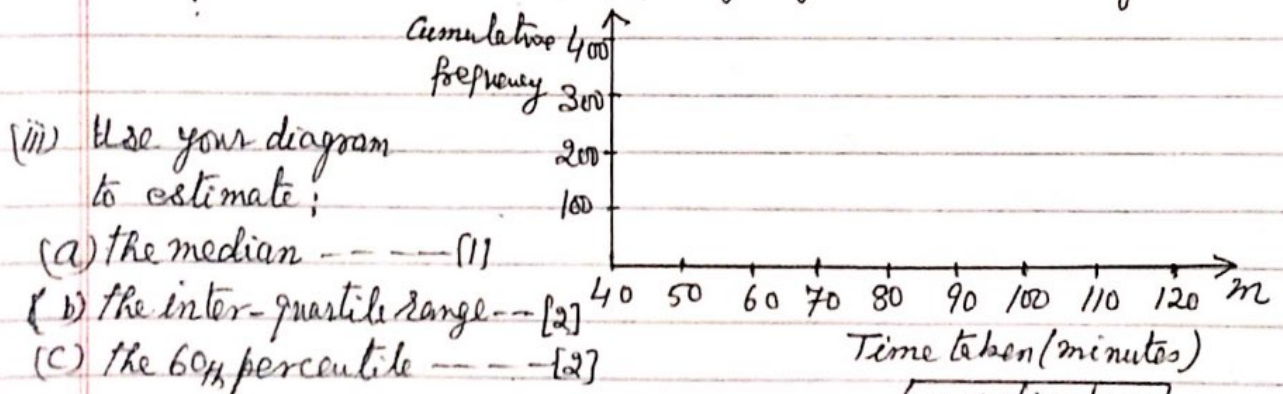
Q2 The table shows information about the time taken by 400 people to complete a race:

Time taken (m minutes)	$45 < m \leq 50$	$50 < m \leq 60$	$60 < m \leq 70$	$70 < m \leq 90$	$90 < m \leq 100$	$100 < m \leq 120$
Frequency	23	64	122	136	26	29

- (a) Calculate an estimate of the mean time taken. --- [1]
 (b) (i) Complete the cumulative frequency table. --- [2]

Time taken (m minutes)	$m \leq 50$	$m \leq 60$	$m \leq 70$	$m \leq 90$	$m \leq 100$	$m \leq 120$
Cumulative frequency						

- (ii) On the grid, draw a cumulative frequency diagram to show this information. --- [3]



M-17 / 42 / Q7

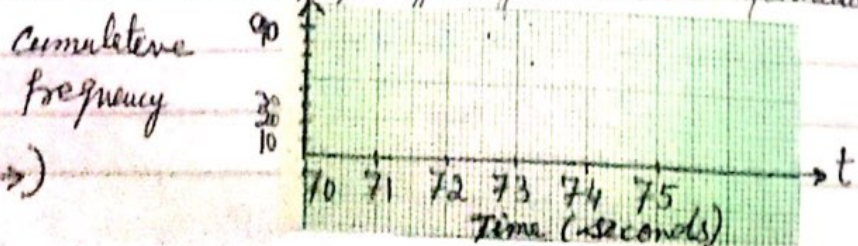
Q3 The time taken for each of 90 cars to complete one lap of a race track is shown in the table.

Time (t seconds)	$70 < t \leq 71$	$71 < t \leq 72$	$72 < t \leq 73$	$73 < t \leq 74$	$74 < t \leq 75$
Frequency	17	24	21	18	10

- (a) Write down the modal time interval. --- $< t \leq$ --- [1]
 (b) Calculate an estimate of the mean time. --- [4]
 (c) (i) Complete the cumulative frequency table. --- [2]

time (t seconds)	$t \leq 71$	$t \leq 72$	$t \leq 73$	$t \leq 74$	$t \leq 75$
Cumulative frequency	17				

- (ii) On the grid, draw a cumulative frequency diagram to show information. [3]



(Continued →)

(Continued →)

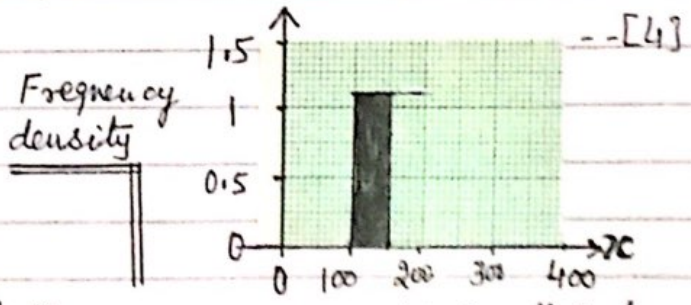
- Q3(c)(iii) Find the median time. --- [1]
 (iv) Find the interquartile range. --- [2]

(d) One lap of the race track measures 3720 metres, correct to the nearest 10 m. A car completed the lap in 75 seconds, correct to the nearest second. Calculate the upper bound for the average speed of this car. Give your answer in kilometres per hour. S-17/41/Q3 --- [4]

Q4 (a) 200 students estimate the capacity, x millilitres, of a cup. The results are shown by in the frequency table.

Capacity (x ml)	$0 < x \leq 100$	$100 < x \leq 150$	$150 < x \leq 200$	$200 < x \leq 250$	$250 < x \leq 400$
Frequency	20	55	66	35	24

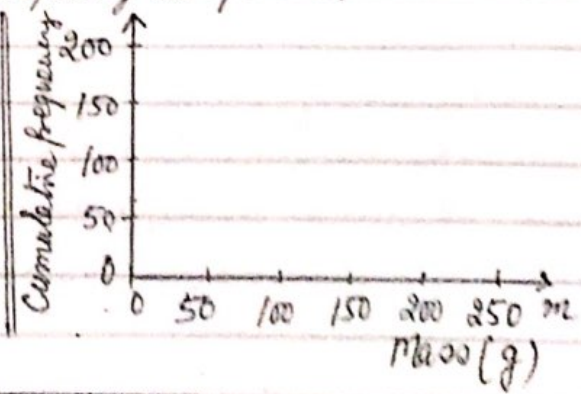
- (i) Calculate the estimate of mean. --- [4]
 (ii) Complete the histogram: --- [4]



(b) The 200 students also estimate the mass, m grams, of a small rock.

Mass (m grams)	$m \leq 50$	$m \leq 100$	$m \leq 150$	$m \leq 200$	$m \leq 250$
Cumulative frequency	28	64	104	168	200

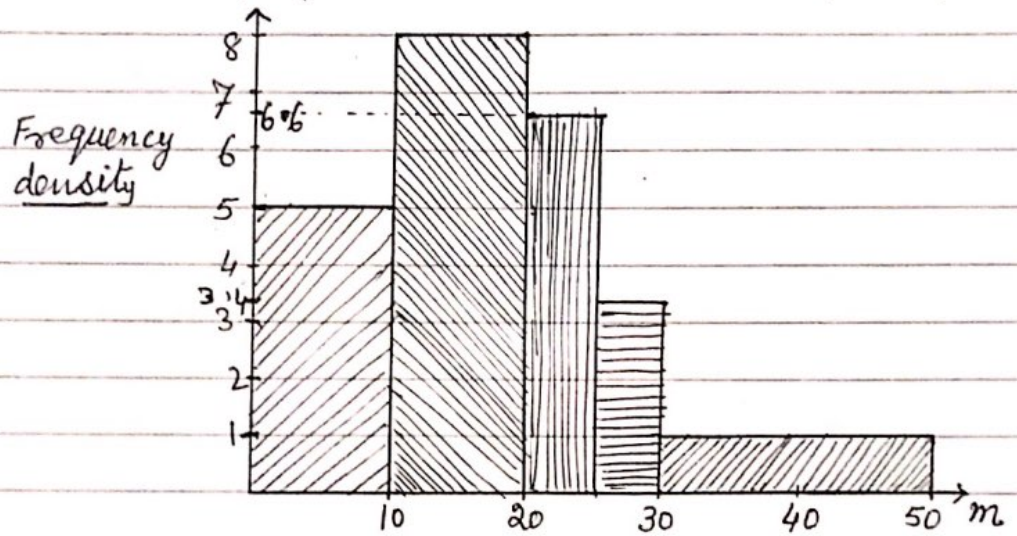
- (i) on the grid, draw a cumulative frequency diagram: --- [3]
 (ii) Find:
 (a) the 65th percentile --- [1]
 (b) the number of students who estimated more than 75g. --- [2]



S-17/42/Q3

Q5 (a) Haroon has 200 letters to post.

The histogram shows information about the masses, m grams, of the letters.



(i) Complete the frequency table for 200 letters.

Mass (grams)

[3]

Mass (m grams)	$0 < m \leq 10$	$10 < m \leq 20$	$20 < m \leq 25$	$25 < m \leq 30$	$30 < m \leq 50$
Frequency	50			17	

(ii) Calculate an estimate of the mean mass.

[4]

(b) Haroon has 15 parcels to post.

The table shows information about the sizes of these parcels.

Size	Small	Large
Frequency	9	6

Two parcels are selected at random. Find the probability that:

(i) both parcels are large,

[2]

(ii) one parcel is small and the other is large.

[3]

(c) The probability that a parcel arrives late is $\frac{3}{80}$, 4000 parcels are posted. Calculate an estimate of the number of parcels expected to arrive late.

[1]

[5-17/43/Q5]

Q6 (a) The table shows the marks gained by 10 students in their physics test and their mathematics test.

Physics Marks	63	61	14	27	72	75	44	40	28	50
Maths. Marks	52	80	16	36	79	75	51	35	24	63

(continued →)

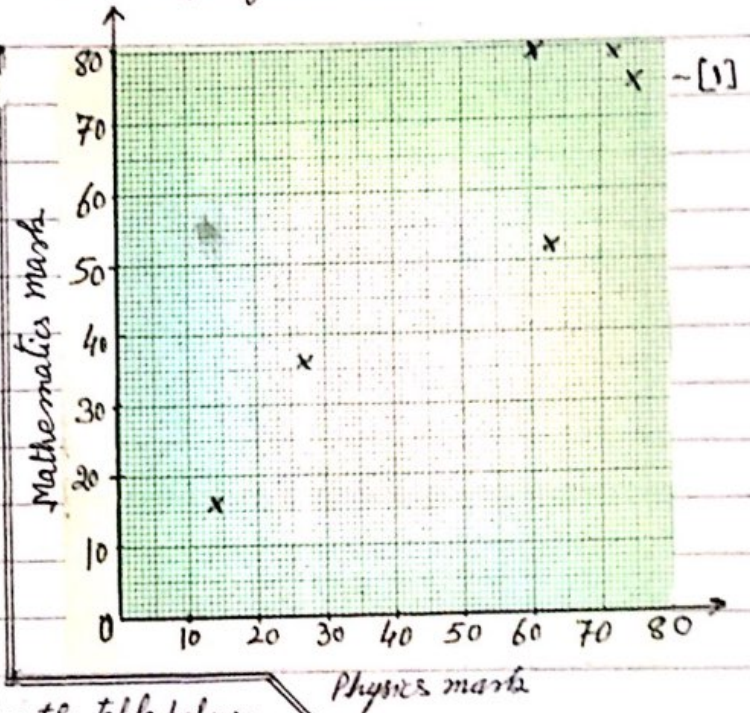
(Continued →)

Q 6(a)(i) Complete the scatter diagram below.

The first six points have been plotted for you.

--- [2]

(ii) What type of correlation is shown in the scatter diagram.



--- [1]

The marks of 30 students

(b) in a spelling test are shown in the table below:

Marks	0	1	2	3	4	5
Frequency	2	4	5	5	6	8

Find the mean, median, mode and range of these marks.

--- [7]

(c) The table shows the marks gained by some students in their English test.

Marks	52	75	91
Number of Students	x	45	11

The mean marks for these students is 70.3

Find the value of x .

$\frac{5 \cdot 17}{43} \cdot 98$ --- [3]

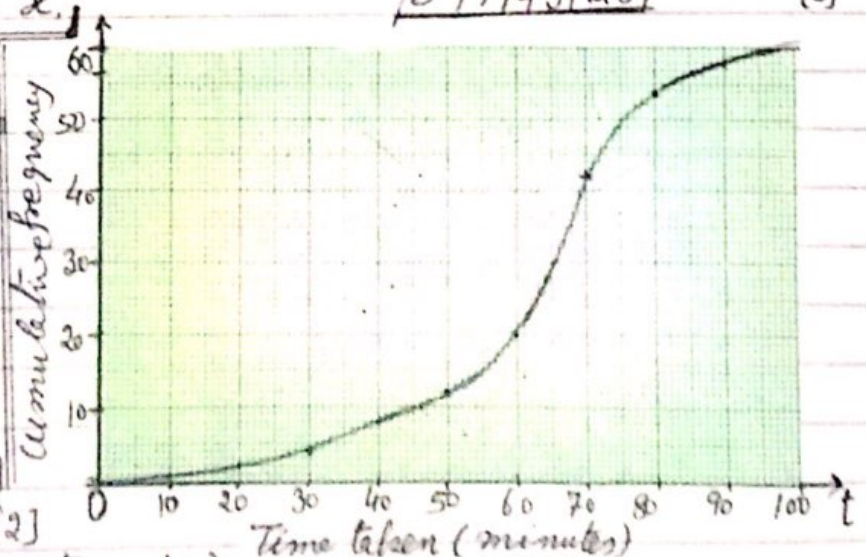
Q7 The cumulative frequency diagram shows information about the time taken, t min, by 60 students to complete a test.

(a) Find:

(i) the median --- [1]

(ii) the interquartile range --- [2]

(iii) the 40% percentile --- [2]



(Continued →)

(Continued →)

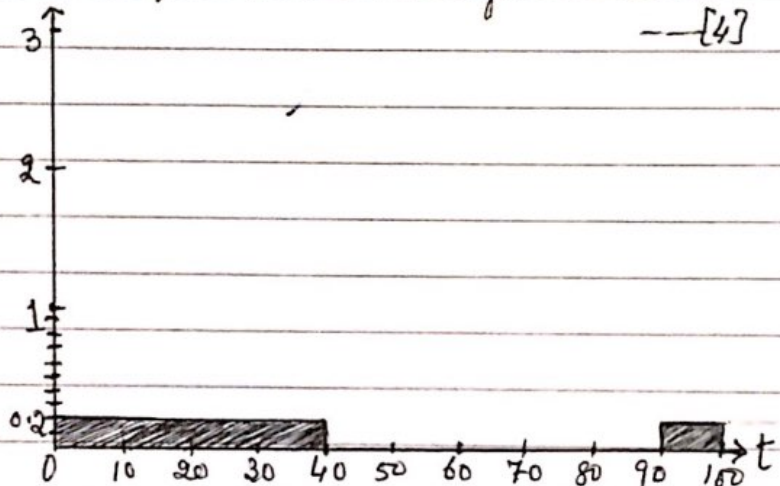
Q 7(a)(iv) the number of students who took more than 80 minutes to complete the test. -- [2]

(b) Use cumulative frequency diagram to complete the frequency table. [3]

Time Taken (t minutes)	$0 < t \leq 40$	$40 < t \leq 60$	$60 < t \leq 70$	$70 < t \leq 80$	$80 < t \leq 90$	$90 < t \leq 100$
Frequency	8				4	

(c) On the grid, complete the histogram to show the information in the table in part (b). -- [4]

M-16/42/Q4

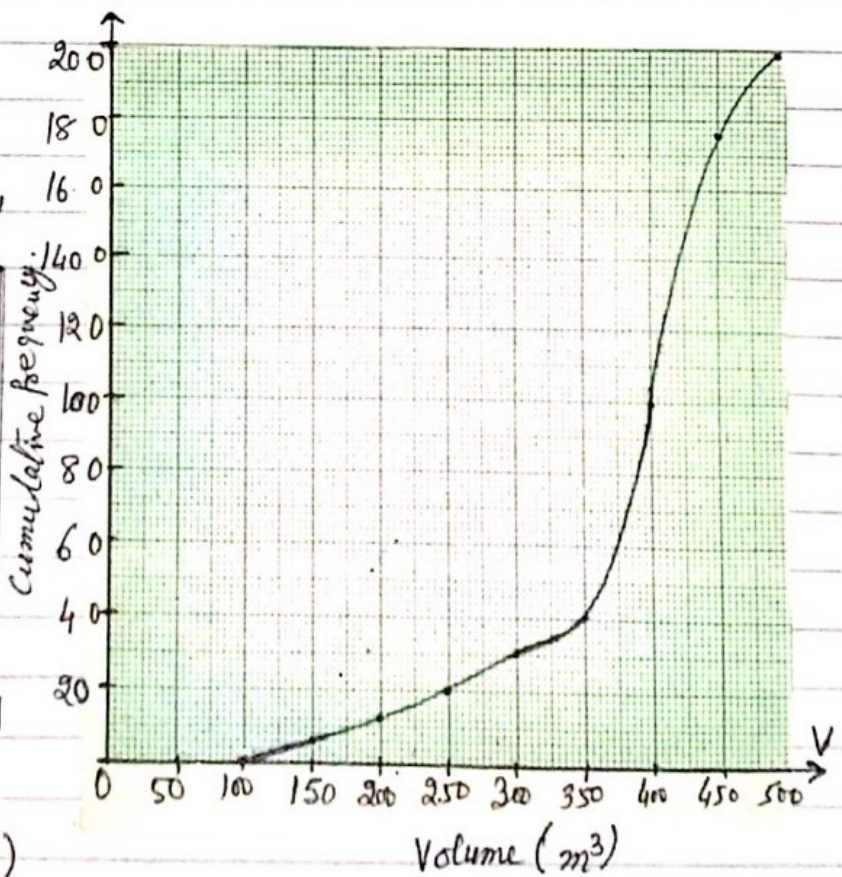


Q8 (a) 200 students estimate the volume, $V \text{ m}^3$, of a class room.

The cumulative frequency diagram shows their results.

Find,

- (i) the median, -- [1]
- (ii) the lower quartile -- [1]
- (iii) the inter-quartile range -- [1]
- (iv) the number of students who estimate that volume is greater than 300 m^3 , -- [2]



(Continued →)

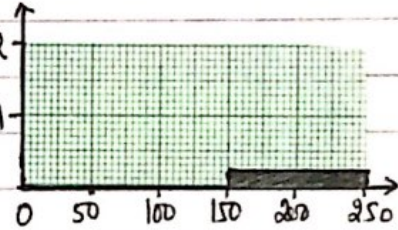
(Continued →)

Q8(b) The 200 students also estimate the total area, $A \text{ m}^2$, of the windows in the classroom. The results are shown in the table:

Area ($A \text{ m}^2$)	$20 < A \leq 60$	$60 < A \leq 100$	$100 < A \leq 150$	$150 < A \leq 250$
Frequency	32	64	80	24

- (i) Calculate the estimate of the mean. Show all your working. --- [4]
- (ii) Complete the histogram to show the information in the table --- [4]
- (iii) Two of the 200 students are chosen at random. Find the probability that they both estimate that the area is greater than 100 m^2 . --- [3]

S-16/41/Q3

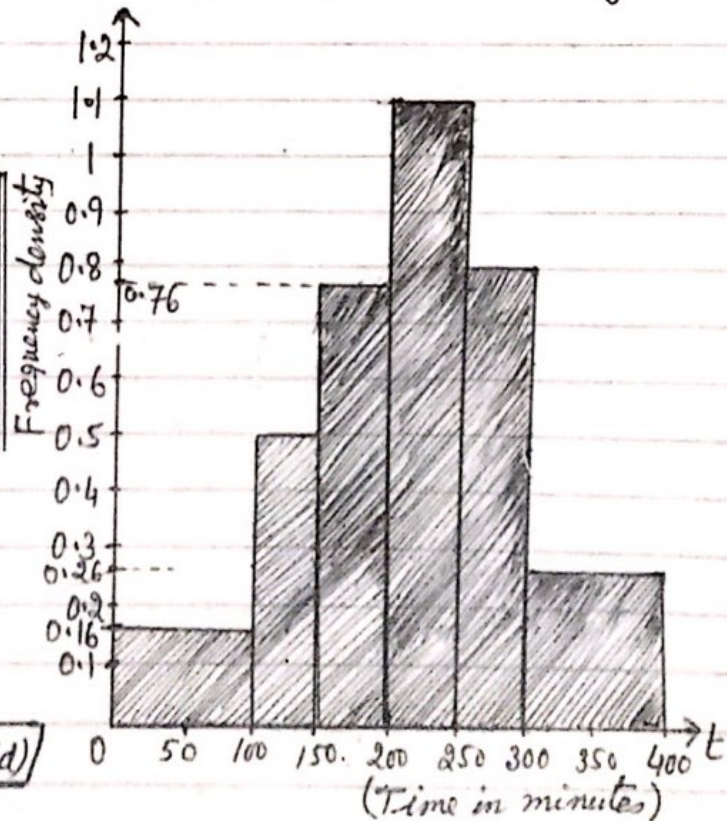


Q9(c) The table shows the amount of money, $\$a$, received for parking each day for 200 days.

Amount ($\$a$)	$200 < a \leq 250$	$250 < a \leq 300$	$300 < a \leq 350$	$350 < a \leq 400$	$400 < a \leq 450$	$450 < a \leq 500$
Frequency	13	19	27	56	62	23

Calculate an estimate of the mean amount of money received each day. --- [4]

(d) The histogram shows the length of time that 200 cars were parked.

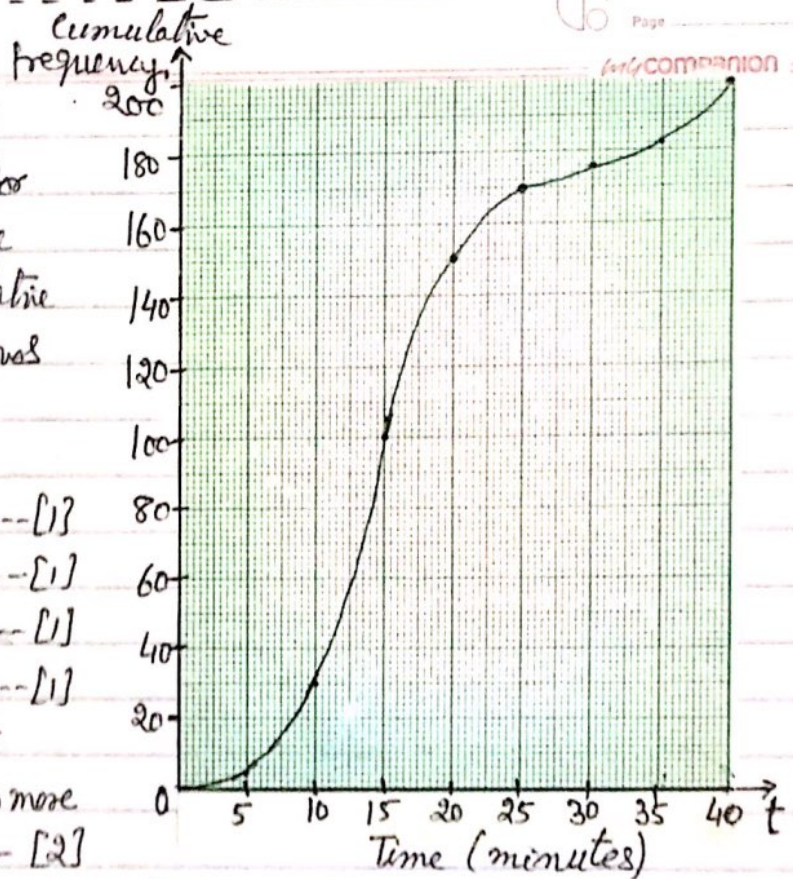


(i) Calculate the number of cars that were parked for 100 minutes or less. --- [1]

(ii) Calculate the percentage of cars that were parked for more than 250 minutes. --- [2]

S-16/43/Q4(c),(d)

Q10(a) 200 students record the time, t minutes, for their journey from home to school. The cumulative frequency diagram shows the results.



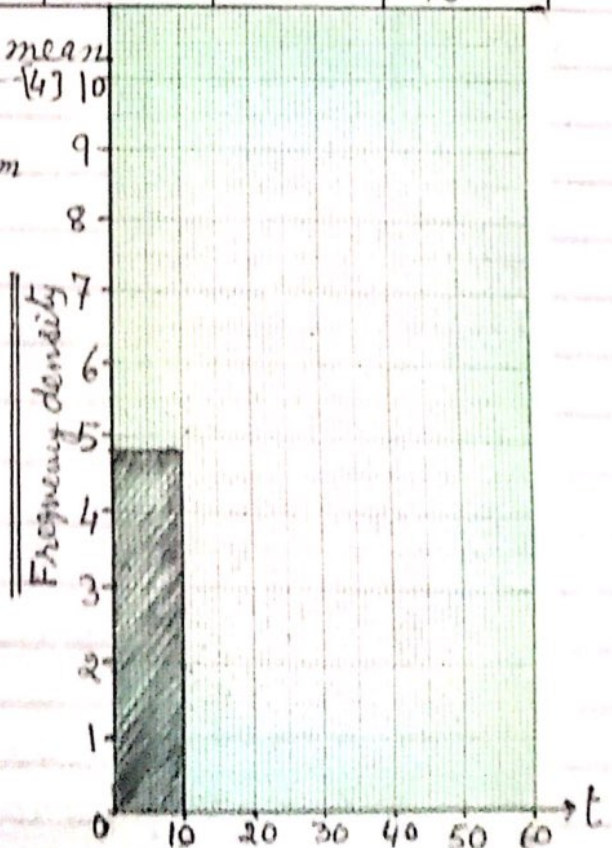
- Find
- (i) the median --- [1]
 - (ii) the lower quartile -- [1]
 - (iii) the inter-quartile range -- [1]
 - (iv) the 15th percentile -- [1]
 - (v) the number of students whose journey time was more than 30 minutes --- [2]

(b) The 200 students record the time, t minutes, for their journey from school to home. The frequency table shows the results.

Time (t minutes)	$0 < t \leq 10$	$10 < t \leq 15$	$15 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 60$
Frequency	48	48	60	26	18

(i) Calculate an estimate of the mean --- [4]

(ii) On the grid, complete the histogram to show the information in the frequency table. --- [4]

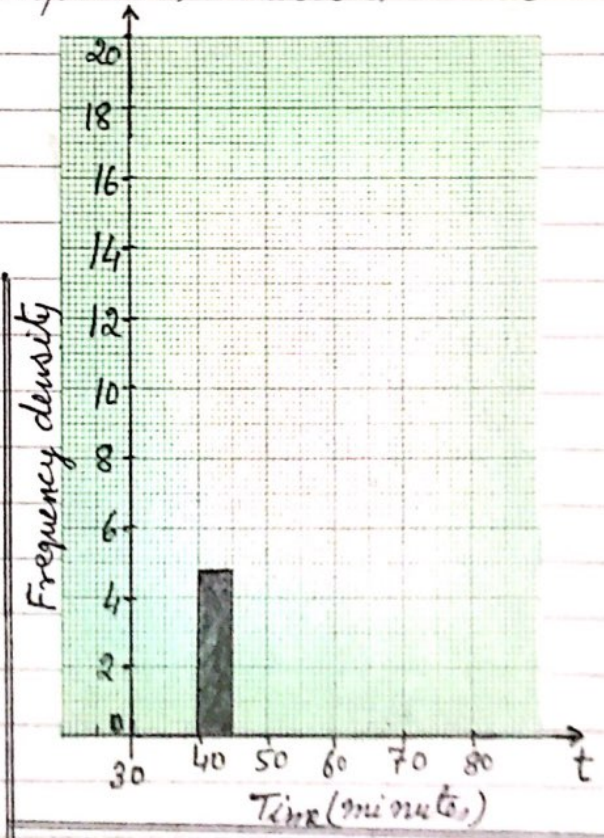


W-16/41/R2

Q11 200 people run 10 km. The table shows some information about the times, t minutes, taken to run the 10 km.

Time (t minutes)	$30 < t \leq 40$	$40 < t \leq 45$	$45 < t \leq 50$	$50 < t \leq 55$	$55 < t \leq 60$	$60 < t \leq 80$
Frequency	8	22	95	55	14	6

- (a) Howard takes 40 minutes to run the 10 km. Calculate his average speed in km/h. -- [2]
 (b) Calculate an estimate of the mean time. -- [4]
 (c) Complete the histogram to show the information in the table. -- [4]



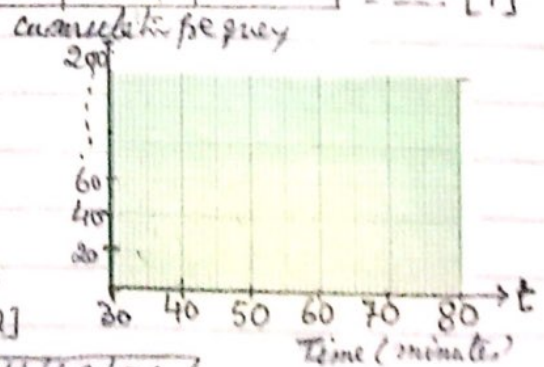
d(i) Use the frequency table opposite to complete the cumulative frequency table:

Time (t minutes)	$t \leq 40$	$t \leq 45$	$t \leq 50$	$t \leq 55$	$t \leq 60$	$t \leq 80$
Cumulative frequency	8	30			194	200

(ii) Draw a cumulative frequency diagram. --- [3]

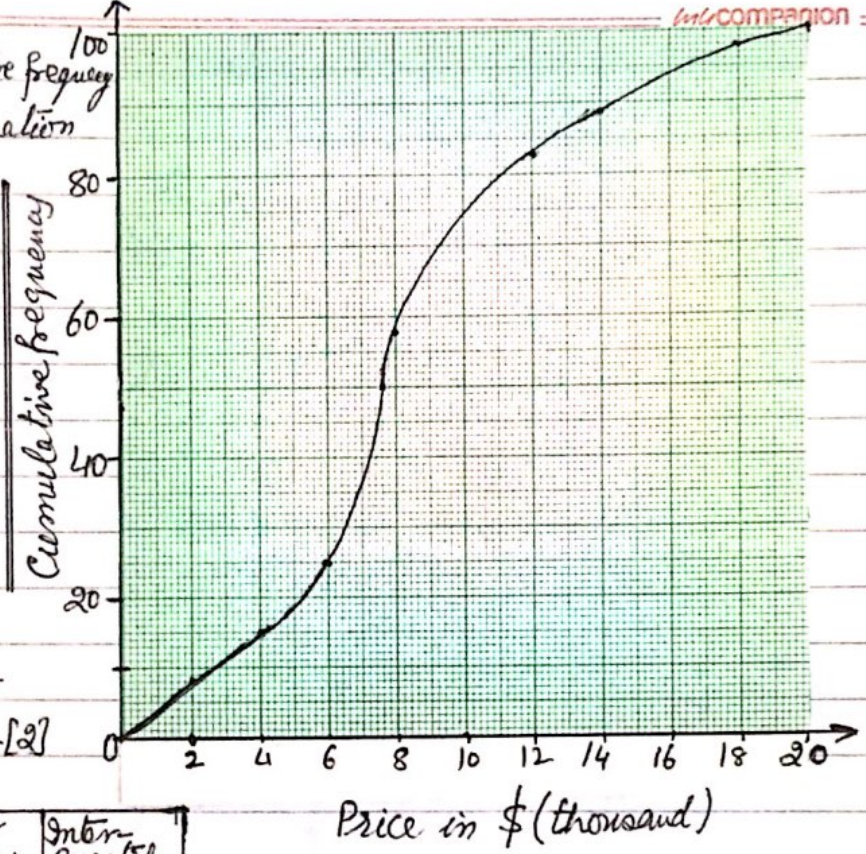
(iii) Use your diagram to find,

- (a) the median --- [1]
 (b) the 90th percentile --- [1]
 (c) the number of people who took more than 58 minutes to run the 10 km --- [2]



W-16/42/Q4

Q 12 (a)(i) The cumulative frequency diagram shows information about the prices of 100 cars on Website A.



Use the information to complete this table. ---[2]

Lower quartile	Median	Upper quartile	Inter-quartile range.
\$	\$ 7600	\$	\$

Price in \$ (thousand)

---[2]

(ii) This table shows information about the prices of cars on Website B.

Here are two statements comparing the distributions of prices of cars on Website A and Website B.

Lower quartile	Median	Upper quartile	Inter-quartile range.
\$ 7600	\$ 10800	\$ 13600	\$ 6000

For each statement write True or False. Give a reason for each answer, stating clearly which statistics you use to make your decision.

(a) The prices of cars on Website A are lower than the prices of cars on Website B. --- because --- [1]

(b) A greater percentage of cars have a price more than \$ 13600 on Website A compared to Website B. ---

--- because --- [1]

(continued →)

(Continued →)

Q12(b) The table shows the prices of cars on Website B.

Price (\$P)	Number of Cars
$0 < P \leq 6000$	9
$6000 < P \leq 8000$	29
$8000 < P \leq 10000$	20
$10000 < P \leq 12000$	14
$12000 < P \leq 14000$	21
$14000 < P \leq 22000$	27

Calculate an estimate of the mean price of the 120 cars. --- [4]

(c) The price of a car is \$8760.

Bryan pays a deposit of 25% of this price and then 24 equal monthly payments.

After 24 months, he will have paid a total of \$9948.

Calculate the cost of one monthly payment. W-16/43/27 --- [3]

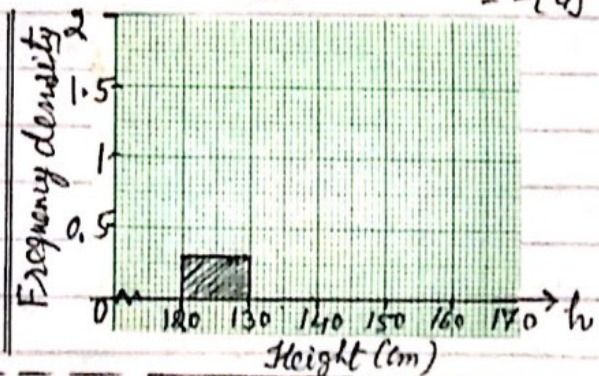
Q13 The table shows the height, h cm, of 40 children in a class.

Height (h cm)	$120 < h \leq 130$	$130 < h \leq 140$	$140 < h \leq 144$	$144 < h \leq 150$	$150 < h \leq 170$
Frequency	3	14	4	6	13

(a) Write down the class interval containing the median. --- [1]

(b) Calculate the estimate of mean height. --- [4]

(c) Complete the histogram. --- [4]



M-15/42/27

Q14. The table shows the time, t minutes, that 400 people take to complete a test.

Time taken (t mins)	$0 < t \leq 10$	$10 < t \leq 24$	$24 < t \leq 30$	$30 < t \leq 40$	$40 < t \leq 60$	$60 < t \leq 70$
Frequency	10	90	135	85	70	10

(a) (i) Write down the modal time interval. --- [1]

(ii) Calculate an estimate of the mean time taken to complete the test. --- [4]

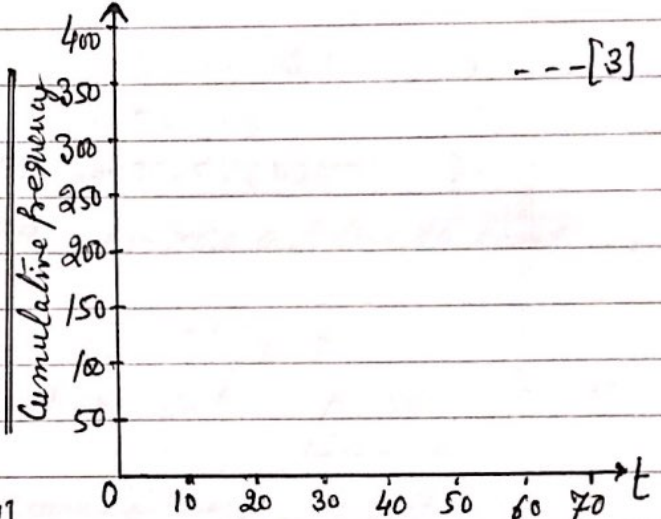
(Continued →)

(continued →)

Q14(b) (i) Complete the table of cumulative frequency. --- [2]

Time taken (t mins)	$t \leq 10$	$t \leq 24$	$t \leq 30$	$t \leq 40$	$t \leq 60$	$t \leq 70$
Cumulative frequency	10	100				400

(ii) On the grid opposite, draw a cumulative frequency diagram to show this information. --- [3]

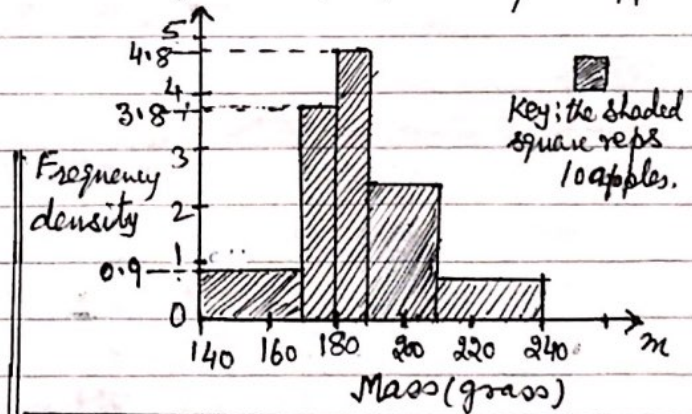


(c) Use your graph to estimate,

- (i) the median time --- [1]
- (ii) the inter-quartile range -- [2]
- (iii) 15th percentile -- [2]
- (iv) the number of people who took more than 50 minutes, --- [2]

S-15/41/Q6

Q15 The histogram shows the distribution of masses, in grams, of 360 apples.



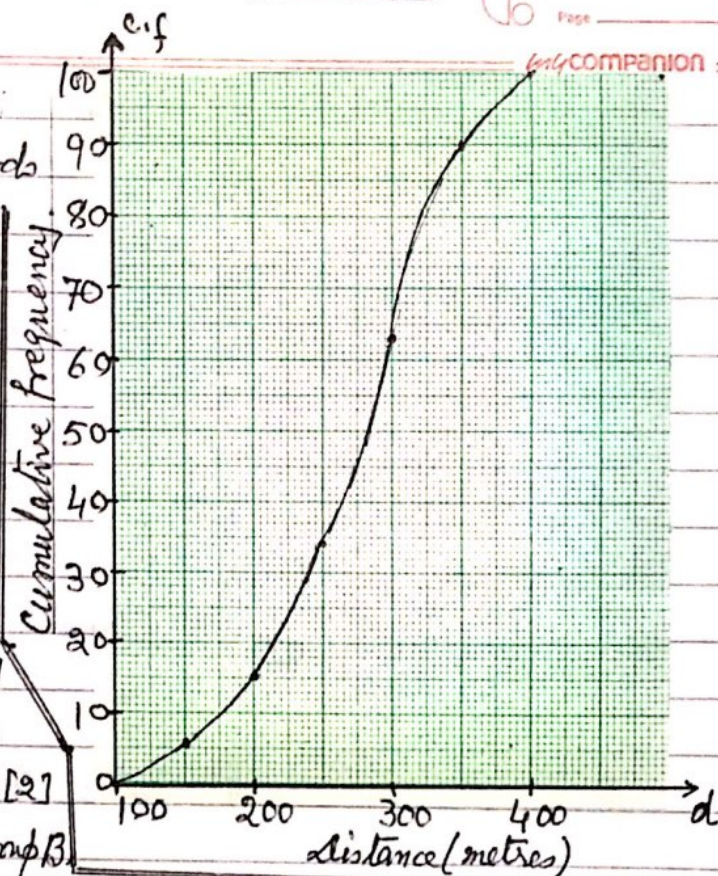
(a) Use the histogram to complete the frequency table: --- [3]

(b) Calculate an estimate of the mean mass of the 360 apples. --- [4]

Mass (m grams)	Number of apples.
$140 < m \leq 170$	
$170 < m \leq 180$	
$180 < m \leq 190$	
$190 < m \leq 210$	92
$210 < m \leq 240$	42

W-17/41/Q5

Q16(a) There are 100 student in group A. The teacher records the distance, d metres, each student runs in one minute. The results are shown in the cumulative frequency graph.

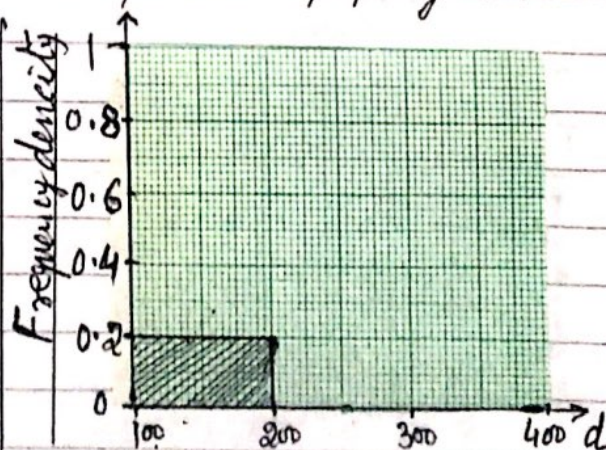


- Find,
- (i) the median --- [1]
 - (ii) the upper quartile ... [1]
 - (iii) the inter-quartile range --- [1]
 - (iv) the number of students who run more than 350m, --- [2]

(b) There are 100 students in group B. The teacher records the distance, d metres, each of these students run in one minute. The results are shown in frequency table.

Distance (d metres)	$100 < d \leq 200$	$200 < d \leq 250$	$250 < d \leq 280$	$280 < d \leq 320$	$320 < d \leq 400$
Number of Students	20	22	30	16	12

- (i) Calculate an estimate of the mean distance for group B. --- [4]
- (ii) Complete the histogram to show the the information in frequency table. --- [4]



(c) For the 100 students in group B, the median is 258 m. Complete the statement.

On average, the students in group A run ----- than the students in group B.

[W-17/42/Q6]

[1]

Q17 The table shows information about the time, t minutes, taken for each of 150 girls to complete an essay.

Time (t min)	$60 < t \leq 65$	$65 < t \leq 70$	$70 < t \leq 80$	$80 < t \leq 100$	$100 < t \leq 150$
Frequency	10	26	34	58	22

- (a) Write down the interval that contains the median time. -- [1]
 (b) Calculate an estimate of the mean time. --- [4]
 (c) Rafay looks at the frequency table.
 (i) He says it is not possible to work out the range of the times. Explain why he is correct. --- [1]
 (ii) He draws a pie chart to show this information. Calculate the sector angle for the interval $65 < t \leq 70$ minutes. -- [2]
 (d) A girl is chosen at random. Work out the probability that she took more than 100 min to complete the essay. -- [1]
 (e) Two girls are chosen at random. Work out the probability that, to complete the essay,
 (i) they both took 65 minutes or less. --- [2]
 (ii) one took 65 minutes or less and the other took more than 100 min. --- [3]
 (f) The information in the frequency table is shown in a histogram. The height of the blocks for $60 < t \leq 65$ interval is 5 cm. Complete the table: --- [3]

Time (t min)	$60 < t \leq 65$	$65 < t \leq 70$	$70 < t \leq 80$	$80 < t \leq 100$	$100 < t \leq 150$
Height of block (cm)	5				

W-17/43/Q4

Q18 (a) A group of 50 students estimated the mass, M grams, of sweets in a jar. The results are shown in the table.

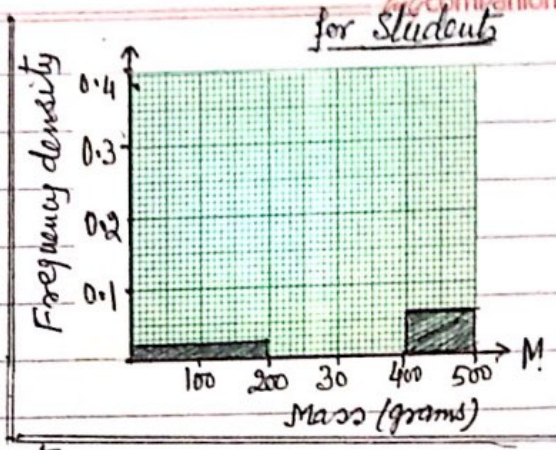
- (i) Calculate an estimate of the mean. --- [4]

Mass (M grams)	Number of Students
$0 < M \leq 200$	5
$200 < M \leq 300$	9
$300 < M \leq 350$	18
$350 < M \leq 400$	12
$400 < M \leq 500$	6

(continued →)

(continued →)

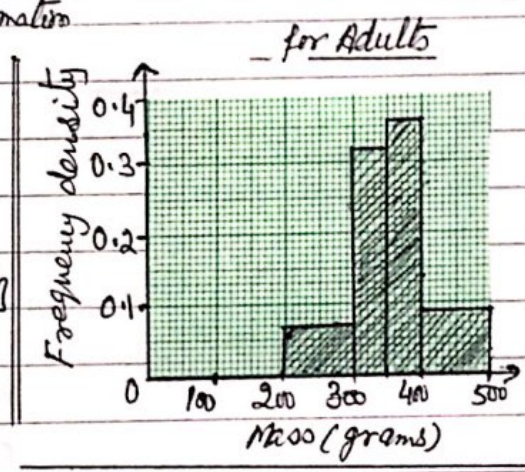
Q18 (ii) Complete this histogram to show the information in the table, --- [3]



(b) A group of 50 adults also estimate the mass, M grams, of the sweets in the jar.

The histogram below shows information about their estimates.

Use histogram to make two comparisons between the distributions of the estimates of the students and the adults. --- [2]



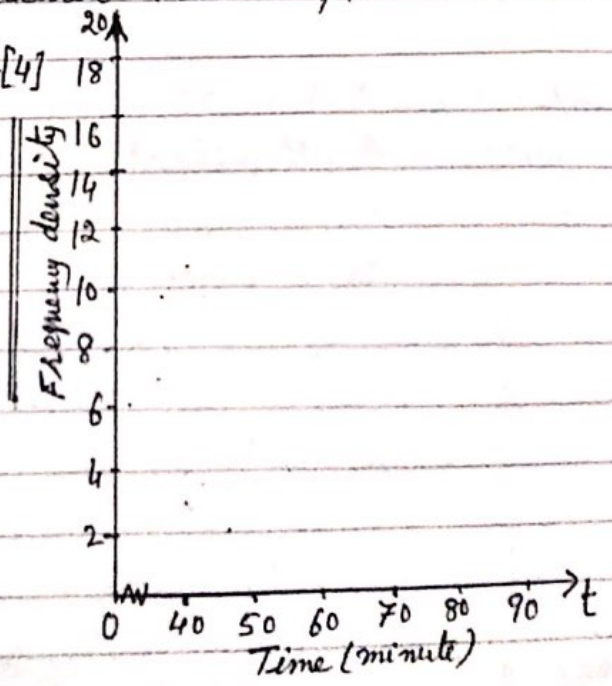
S-15/42/Q7

Q19 The table shows the times, t minutes, taken by 200 students to complete an IGCSE paper.

Time (t min)	$40 < t \leq 60$	$60 < t \leq 70$	$70 < t \leq 75$	$75 < t \leq 90$
Frequency	10	50	80	60

(a) By using mid-interval values, calculate an estimate of the meantime. --- [3]

(b) On the grid, draw a histogram to show the information in the table. --- [4]



S-15/43/Q4

Q20 120 students take a mathematics examination.

(a) The time taken, m minutes, for each student to answer question 1 is shown in this table.

Time (m min)	$0 < m \leq 1$	$1 < m \leq 2$	$2 < m \leq 3$	$3 < m \leq 4$	$4 < m \leq 5$	$5 < m \leq 6$
Frequency	72	21	9	11	5	2

Calculate an estimate of mean time taken. ---[4]

(b) (i) Using the table in part (a), complete this cumulative frequency table. [2]

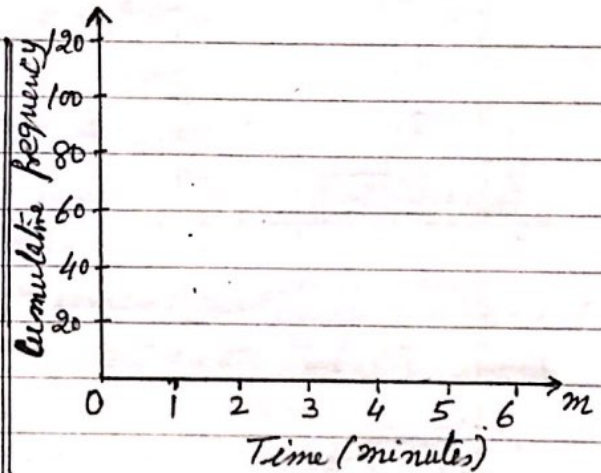
Time (m minutes)	$m \leq 1$	$m \leq 2$	$m \leq 3$	$m \leq 4$	$m \leq 5$	$m \leq 6$
Cumulative frequency	72					

(ii) Draw a cumulative frequency diagram to show the time taken. ---[3]

(iii) Use your cumulative frequency diagram to find,

- (a) the median ---[1]
- (b) the inter-quartile range --[2]
- (c) the 35th percentile. ---[2]

(c) A new frequency table is made from the table shown in part (a)



Time (m minutes)	$0 < m \leq 1$	$1 < m \leq 3$	$3 < m \leq 6$
Frequency	72		

(i) Complete the table above. ---[2]

(ii) A histogram was drawn and the height of the first block representing the time $0 < m \leq 1$ was 3.6 cm. Calculate the heights of the other two blocks.

[W-15/41/Q6]

---[3]

Q21 Leo measured the rainfall each day, in millimetres, for 120 days.

The cumulative frequency table shows the results.

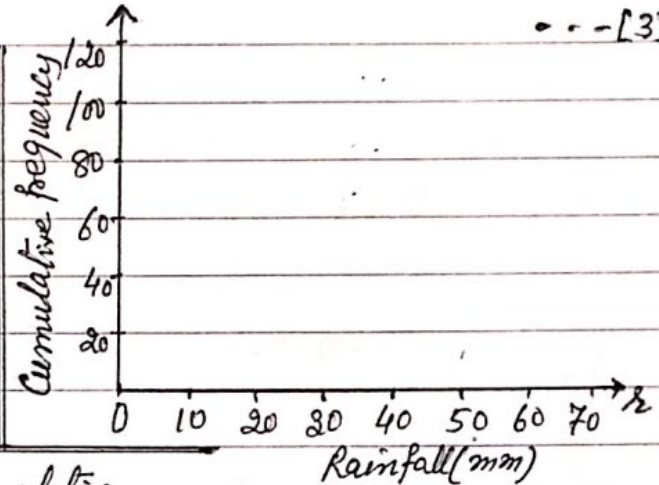
Rainfall (r mm)	$r \leq 20$	$r \leq 25$	$r \leq 35$	$r \leq 40$	$r \leq 60$	$r \leq 70$
Cumulative frequency	5	13	72	90	117	120

(Continued →)

(Continued →)

Q21 (a) On the grid below, draw a cumulative frequency diagram to show these results. --- [3]

- (b) (i) Find the median. --- [1]
 (ii) Use your diagram to find the number of days when the rainfall was more than 50 mm. --- [2]



(c) Use information in the cumulative frequency table to complete the frequency table below. --- [2]

Rainfall (mm)	$0 < r \leq 20$	$20 < r \leq 25$	$25 < r \leq 35$	$35 < r \leq 40$	$40 < r \leq 60$	$60 < r \leq 70$
Frequency	5		59			3

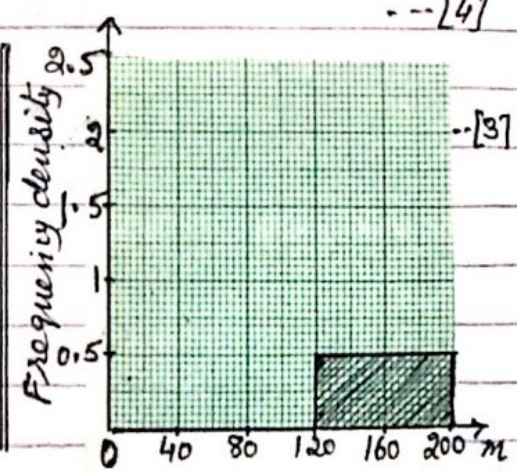
- (d) Use your frequency table to calculate an estimate of the mean. You must show all your working. --- [4]
- (e) In a histogram drawn to show the information in the table in part (c) the frequency density for the interval $25 < r \leq 35$ is 5.9. Calculate the frequency density for the intervals, $20 < r \leq 25$, $40 < r \leq 60$ and $60 < r \leq 70$. --- [4]

W-15/42/Q3

Q22 The table shows information about the masses, m grams, of 160 apples.

Mass (m grams)	$30 < m \leq 80$	$80 < m \leq 100$	$100 < m \leq 120$	$120 < m \leq 200$
Frequency	50	30	40	40

- (a) Calculate an estimate of the mean. --- [4]
- (b) On the grid, complete the histogram to show the information in the frequency table. --- [3]
- (c) An apple is chosen at random from the 160 apples. Find the probability that its mass is more than 120g.



(Continued →)

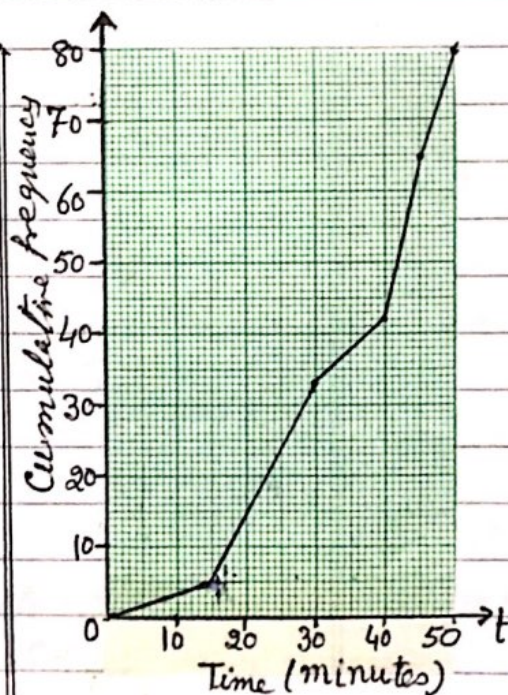
(continued →)

- Q22 (d) Two apples are chosen at random from 160 apples, without replacement. Find the probability that,
- (i) they both have a mass of more than 120g. ---[2]
 - (ii) one has a mass of more than 120g and one has a mass 80g or less. ---[3]

W-15/43/Q6

Q23 The times (t minutes) taken by 80 people to complete a charity swim were recorded. The results are shown in the cumulative frequency diagram.

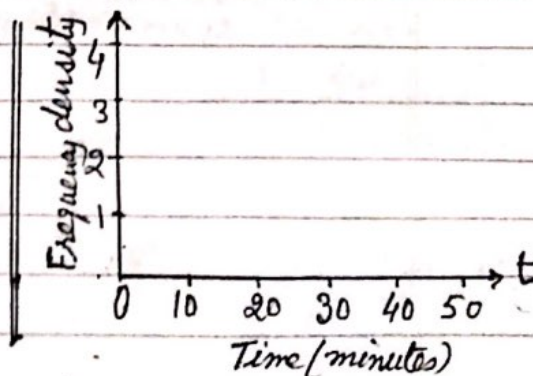
- (a) Find:
- (i) the median ---[1]
 - (ii) the inter-quartile range. ---[2]
 - (iii) the 70th percentile. ---[2]



(b) The times taken by 80 people are shown in this grouped frequency table.

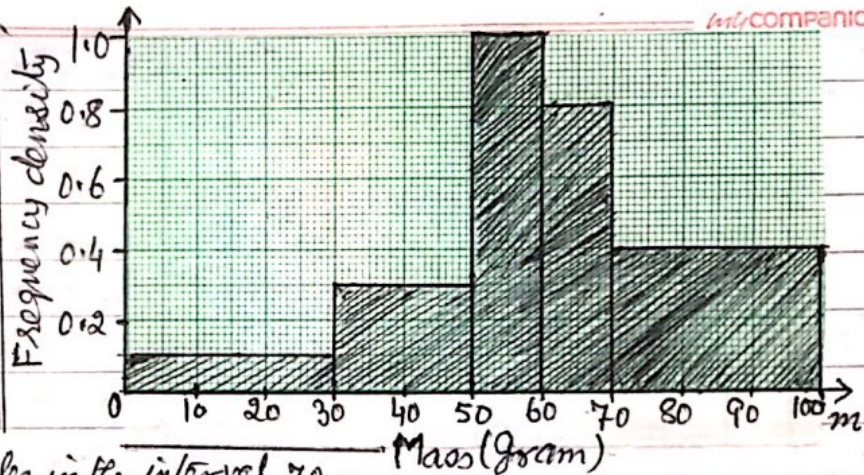
Time (t minutes)	$0 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 45$	$45 < t \leq 50$
Frequency	12	21	33	14

- (i) Calculate an estimate of the mean time. ---[4]
- (ii) Draw the histogram to represent the grouped frequency table. ---[4]



S-14/41/Q9

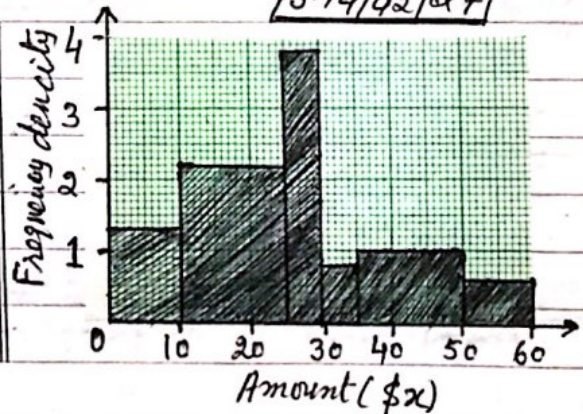
Q24 (a) The histogram shows some information about the masses (grams) of 39 apples.



- (i) Show that there are 12 apples in the interval $70 < m \leq 100$. --- [1]
- (ii) Calculate an estimate of the mean mass of 39 apples. --- [5]
- (b) The mean mass of 20 oranges is 70g. One orange is eaten. The mean mass of the remaining oranges is 70.5g. Find the mass of the orange that was eaten. --- [3]

S-14/42/Q7

Q25 A survey asked 90 people how much money they gave to charity in one month. The histogram shows the results of the survey.



- (a) Complete the frequency table for the six columns in the histogram. --- [5]

Amount (\$x)	$0 < x \leq 10$				
Frequency					

- (b) Use your frequency table to calculate an estimate of the mean amount these 90 people gave to charity. --- [4]

S-14/43/Q2

Q26 A company tested 200 light bulbs to find the lifetime, T hours, of each bulb.

The results are shown in the table.

- (a) Calculate an estimate of mean lifetime for the 200 light bulbs. --- [4]

Life time (T hours)	Number of bulbs
$0 < T \leq 1000$	10
$1000 < T \leq 1500$	30
$1500 < T \leq 2000$	55
$2000 < T \leq 2500$	72
$2500 < T \leq 3500$	33

(continued →)

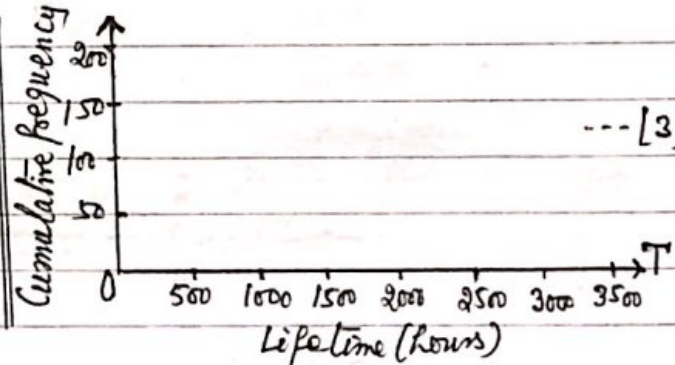
(Continued →)

Q26 (b) (i) Complete the cumulative frequency table.

--- [2]

Lifetime (T hours)	$T \leq 1000$	$T \leq 1500$	$T \leq 2000$	$T \leq 2500$	$T \leq 3500$
Number of bulbs					

(ii) On the grid, draw a cumulative frequency diagram to show this information.



--- [3]

(iii) The company says that the average lifetime of a bulb is 2200 hours. Estimate the number of bulbs that lasted longer than 2200 hours.

--- [2]

(c) Robert buys one energy saving bulb and one halogen bulb.

The prob. that the energy saving bulb lasts longer than 3500 hrs is $\frac{9}{10}$.

The prob. that the halogen bulb lasts longer than 3500 hrs is $\frac{3}{5}$.

Work out the probability that exactly one of the bulbs will last longer than 3500 hours.

[W-14/41/Q6]

Q27 The time, t seconds, taken for each of 50 chefs to cook an omelette is recorded.

Time (t seconds)	$20 < t \leq 25$	$25 < t \leq 30$	$30 < t \leq 35$	$35 < t \leq 40$	$40 < t \leq 45$	$45 < t \leq 50$
Frequency	2	6	7	19	9	7

(a) Write down the modal time interval.

--- [1]

(b) Calculate an estimate of mean. Show all your working

--- [4]

(c) A new frequency table is made from the results shown in the table.

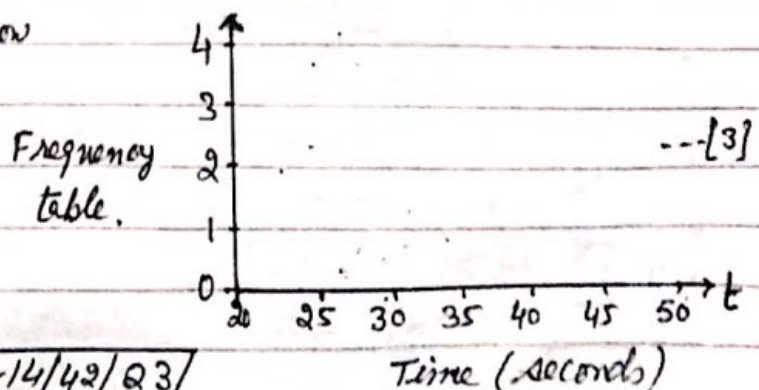
(i) Complete the table,

Time (t seconds)	$20 < t \leq 35$	$35 < t \leq 40$	$40 < t \leq 50$
Frequency			

--- [1]

(ii) On the grid,

draw a histogram to show the information in this new table.



--- [3]

[W-14/42/Q3]

Q28 (a) Ricardo asks some motorists how many litres of fuel they use in one day, The number of litres, correct to the nearest litre, are shown in the table,

Number of litres	16	17	18	19	20
Number of motorists	11	10	p	4	8

(i) For this table, the mean number of litres is 17.7.

Calculate the value of p. ---[4]

(ii) Find the median number of litres. ---[1]

(b) Manuel completed a journey of 320 km in his car.

The fuel for the journey cost \$1.28 for every 6.4 km travelled.

(i) Calculate the cost of fuel for this journey. --[2]

(ii) When Manuel travelled 480 km in his car it used 60 litres of fuel. Manuel's car used fuel at the same rate for the journey of 320 km. --[2]

(iii) Calculate the cost per litre of fuel used for the journey of 320 km. --[2]

(c) Ellie drives a car at a constant speed of 30 m/s correct to the nearest 5 m/s, she maintains this speed for 5 minutes correct to the nearest 10 seconds. Calculate the upper bound of the distance in kilometres that Ellie could have travelled. --[5]

Q29 200 students estimate the mass (in grams) of a coin.

The cumulative frequency diagram shows the results.

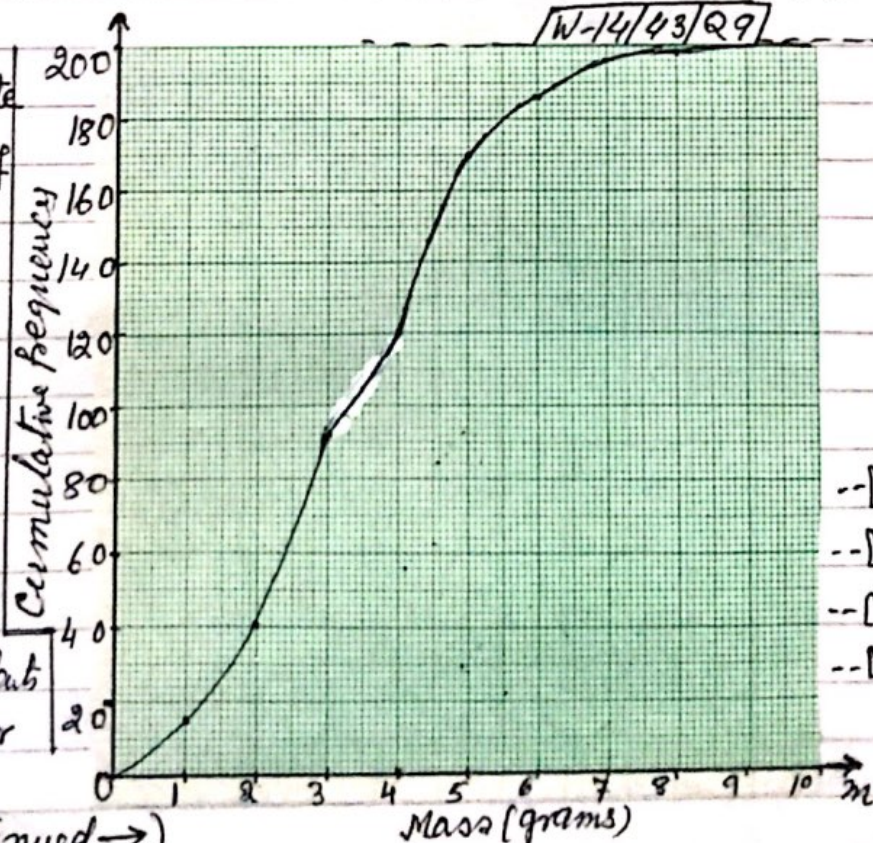
(a) Find.

(i) the median

(ii) the upper quartile

(iii) the 80th %

(iv) the number of students whose estimate is 7g or less.



--[1]

--[1]

--[1]

--[1]

(Continued →)

(→ Continued)

my companion

Q29(b)(i) Use the cumulative frequency diagram to complete the frequency table. --- [2]

Mass (m grams)	$0 < m \leq 2$	$2 < m \leq 4$	$4 < m \leq 6$	$6 < m \leq 8$	$8 < m \leq 10$
Frequency	40				2

(ii) A student is chosen at random. The probability that the student estimates that the mass is greater than M grams is 0.3.
Find the value of M. --- [2]

S-13/41/Q3

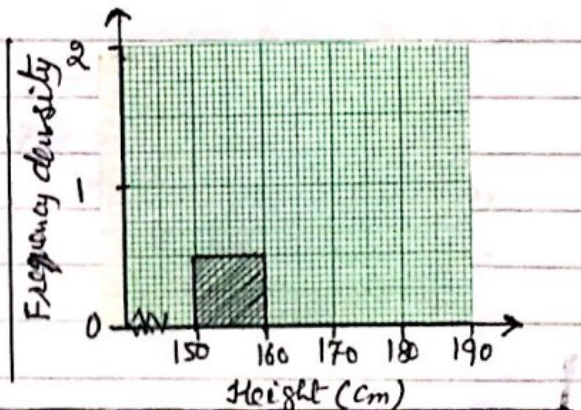
Q30

The table shows information about the heights of a group of 42 students.

Height (h cm)	$150 < h \leq 160$	$160 < h \leq 165$	$165 < h \leq 180$	$180 < h \leq 190$
Frequency	5	9	18	10

- (a) Using mid-interval values, calculate an estimate of the mean height of the students. Show your working. --- [3]
- (b) Write down an interval which contains the lower quartile. --- [1]
- (c) Complete the histogram to show the information in the table. One column has already been drawn for you.

S-13/41/Q5

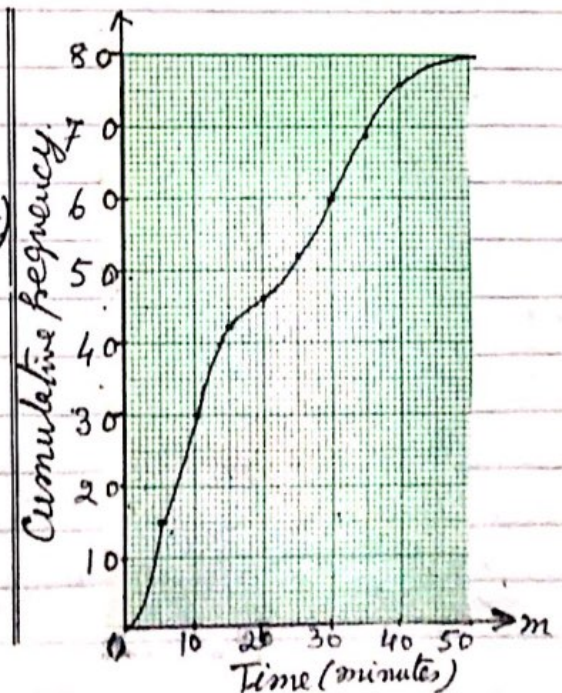


Q31.

I am asked 80 people how many minutes their journey to work took on one day. The cumulative frequency diagram shows the times taken (m minutes).

- (a) Find,
- (i) the median --- [1]
 - (ii) the lower quartile --- [1]
 - (iii) the inter-quartile range --- [1]

(continued →)



(→ continued)

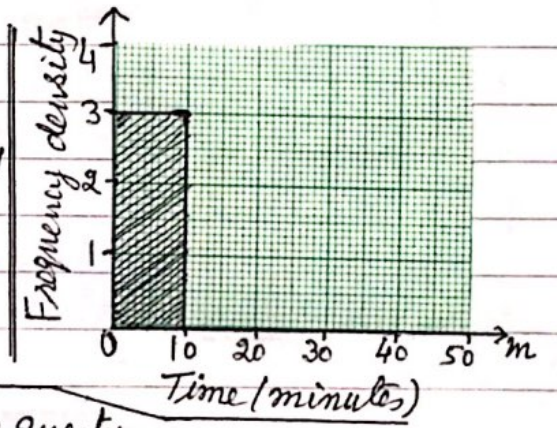
Q31(b) One of the 80 people is chosen at random.
Find the probability that their journey to work took more than 35 minutes. Give your answer as a fraction. ---[2]

(c) Use cumulative frequency diagram to complete this frequency table.

Time (m minutes)	$0 < m \leq 10$	$10 < m \leq 15$	$15 < m \leq 30$	$30 < m \leq 40$	$40 < m \leq 50$
Frequency	30	12	18		

(d) Using mid-interval values, calculate an estimate of the mean journey time for 80 people. ---[3]

(e) Use the table in part (c) to complete the histogram to show the times taken by 80 people. One column has already been completed for you.



S-13/43/Q9

Q32 120 students are asked to answer a question.
The time, t seconds, taken by each student to answer the question is measured. The frequency table shows the results.

Time	$0 < t \leq 10$	$10 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$
Frequency	6	44	40	14	10	6

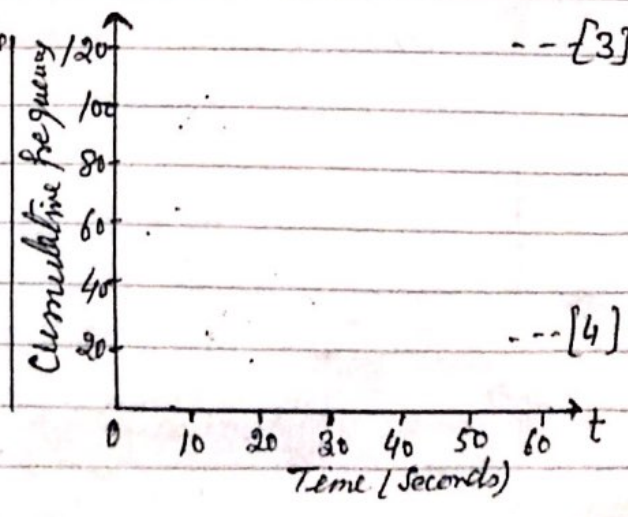
(a) Calculate an estimate of the mean time. ---[4]

(b) (i) Complete the cumulative frequency table: ---[2]

Time	$t \leq 10$	$t \leq 20$	$t \leq 30$	$t \leq 40$	$t \leq 50$	$t \leq 60$
Cumulative frequency	6			104		120

(ii) On the grid, draw a cumulative frequency diagram to show this information. ---[3]

(iii) Use your cumulative frequency diagram to find the median, the lower quartile and the 60th percentile. ---[4]



Continued →

(→ Continued)

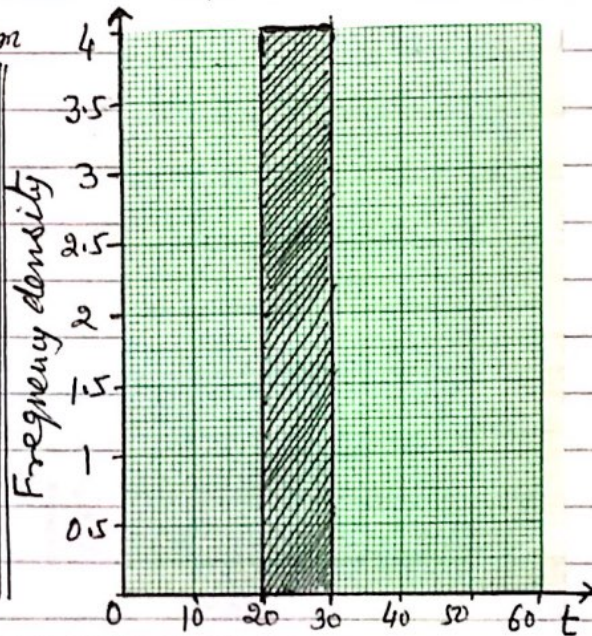
Q 32(C) The intervals for the times are changed.

(i) Use the information in the frequency table to complete this new table.

Time	$0 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 60$
Frequency		40	

---[2]

(ii) On the grid, complete the histogram to show the information in the new table. One column has already been drawn for you. ---[3]



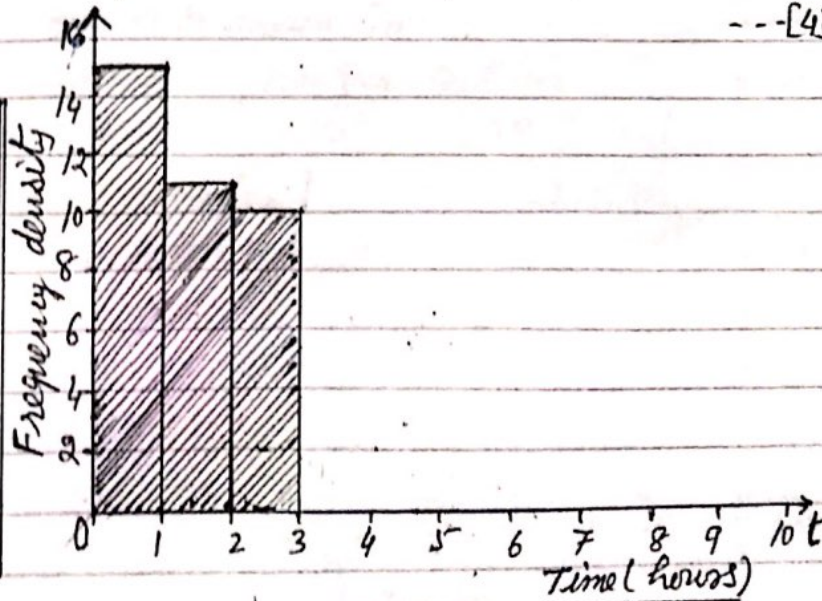
[W-13/41/Q7]

Q33 (a) 80 students were asked how much time they spent on the internet in one day. This table shows the results.

Time (t hours)	$0 < t \leq 1$	$1 < t \leq 2$	$2 < t \leq 3$	$3 < t \leq 5$	$5 < t \leq 7$	$7 < t \leq 10$
Number of Students	15	11	10	19	13	12

(i) Calculate an estimate of the mean time spent on the internet by 80 students. ---[4]

(ii) On the grid, complete the histogram to show this information.



[W-13/43/Q5(a)]

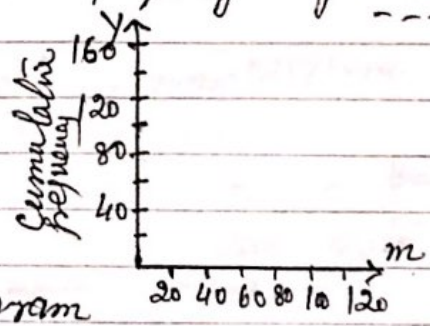
Q34 The frequency table shows information about the time, m minutes, that each of 160 people spend in library:

Time (m minutes)	$0 < m \leq 10$	$10 < m \leq 40$	$40 < m \leq 60$	$60 < m \leq 90$	$90 < m \leq 100$	$100 < m \leq 120$
Frequency	3	39	43	55	11	9

- (a) (i) Find the probability that one of these people, chosen at random, spends more than 100 minutes in the library. --- [1]
 (ii) Calculate an estimate of the mean time spent in the library. --- [4]
 (b) Complete the cumulative frequency table below.

Time (m minutes)	$m \leq 10$	$m \leq 40$	$m \leq 60$	$m \leq 90$	$m \leq 100$	$m \leq 120$
Cumulative Frequency	3	42				

- (c) On the grid opposite, draw the cumulative frequency diagram. --- [2]



- (d) Use your cumulative frequency diagram to find:
 (i) the median, --- [1]
 (ii) The interquartile range, --- [2]
 (iii) the 90th percentile --- [2]
 (iv) the number of people who spend more than 30 minutes in the library. --- [2]

$m=18 \quad 42 \quad 27$

Answers (continued →)

Q1 (a) (i) $1.6 < h \leq 1.7$
 (ii) 1.62 (1.616 to 1.617)
 (b) (i) $\frac{6}{120}$ (ii) $\frac{2147}{2380}$ (or 0.902)
 (c) (i) 95, 120
 (ii) Plot 7 points correctly exact and draw a curve through them
 (d) (i) 1.61 to 1.63
 (ii) 1.555 to 1.57

Q2 (a) 72.7
 (b) (i) 23, 87, 209, 345, 371, 400
 (ii) Correct Graph
 (iii) (a) 69 to 70 (b) 20 to 23 (c) 72 to 75

Q3 (a) $71 < t \leq 72$ (b) 72.3
 (c) (i) 41, 62, 80, 90 (ii) Correct curve
 (iii) 72.1 to 71.4 (iv) 1.9 to 2.2
 (d) 180

Q4 (a) (i) 175.5 (ii) Correct histogram
 (b) (i) Correct Cumulative fre. diagram
 (ii) (a) 170 to 175 (b) 152 to 158.

Q5 (a) (i) 80, 33, 20 (ii) 17.3
 (b) (i) $\frac{30}{210}$ (ii) $\frac{108}{210}$
 (c) 150

Q6 (a) (i) 4 points correctly plotted
 (ii) Positive
 (b) Mean 3.1, Median 3, Mode 5, Range 5
 (c) 24

Q7 (a) (i) 64 (ii) 16 to 16.5
 (iii) 62 (iv) 6
 (continued →)

Q7 (b) 12, 23, 11, 2
 (c) Blocks of height 0.6, 2.3, 1.1 and 0.4 with correct width.

Q8 (a) (i) 400 (ii) 350
 (iii) 70 (iv) 170
 (b) (i) 106 (ii) Correct histogram
 (iii) $\frac{10712}{39800}$

Q9 (c) 376 (d) (i) 16 (ii) 33

Q10 (a) (i) 15 to 15.2 (ii) 10.8 to 11
 (iii) 9 to 9.2 (iv) 10 (v) 24
 (b) (i) 16.75 (ii) Correct histogram.

Q11 (a) 15 (b) 49.2
 (c) Correct histogram (d) (i) 125, 180
 (ii) Correct diagram.
 (iii) (a) 48 to 49 (b) 55 (c) 8 to 14

Q12 (a) (i) 6000, 10200, 4200
 (ii) (a) True, median price is lower.
 (b) False, A's UQ < 13600

Q13 (a) $140 < h \leq 144$ (b) 144.875
 (c) 4 correct blocks.

Q14 (a) (i) $24 < t \leq 30$ (ii) 30.9
 (b) (i) 235, 320, 390
 (ii) Correct curve.

(c) (i) 27.5 to 29 (ii) 12 to 14
 (iii) 18 to 20 (iv) 30 to 45

Q15 (a) 54, 76, 96
 (b) 187

Q16 (a) (i) 280 (ii) 320 (iii) 90
 (iv) 10
 (b) (i) 250.2 (ii) Completion of histogram
 (c) 22 m further.

Answers

Q17 (a) $80 < t \leq 100$ (b) 86
 (c) (i) Reference to not knowing the individual values so we do not know the highest or the lowest values. (c)(ii) 62.4
 (d) $\frac{22}{150}$ (e)(i) $\frac{90}{22350}$ (e)(ii) $\frac{440}{22350}$
 (f) 13, 8.5, 7.25, 1.1.

Q18 (a) (i) 316
 (ii) Three correct blocks with heights 0.09, 0.36, 0.24 with correct widths and no gaps.
 (b) Students have a greater range of estimates.
 (on average) adults estimated a greater mass.

Q19 (a) 72.5 (b) correct histogram

Q20 (a) 1.35 (b) (i) 93, 102, 113, 118
 (b)(ii) correct diagram
 (b)(iii) (a) 0.6 to 0.85 (b) 1.3 to 1.7
 (b) 1.3 to 1.7 (c) 0.3 to 0.6
 (c) (i) 30 and 18 (ii) 0.75 and 0.3

Q21 (a) correct diagram $\bar{x} = 50$
 (b) (i) 32 to 34 (ii) 120 - reading at n
 (c) 8, 18, 27
 (d) 35.2
 (e) 1.6, 1.35, 0.3

Q22 (a) 101.5 to 101.6
 (b) histogram with heights - 1, 1.5 and 2 (no gaps)
 (c) $\frac{40}{160}$ (d) (i) $\frac{1560}{25440}$ (ii) $\frac{4000}{25440}$

Q23 (a) (i) 37.5 to 38.5
 (ii) 19.5 to 20.5 (iii) 4.3
 (b) (i) 31.4 (ii) correct histogram,

Q24 (a) (i) $(100 - 70) \times 0.4 = 12$
 (ii) 60.9 (b) 60.5

Q25 (a) $10 < x \leq 25$, $25 < x \leq 30$
 $30 < x \leq 35$, $35 < x \leq 50$
 $50 < x \leq 60$
 13, 33, 19, 4, 15, 6

(b) 25.1 (or 25.13 to 25.14)

Q26 (a) 2000 (b) (i) 0, 40, 95, 167, 200
 (b)(ii) correct curve (iii) 68 to 80
 (c) $\frac{21}{50}$

Q27 (a) $35 < t \leq 40$ (b) 37.3
 (c) (i) 15, 19, 16 (ii) Rectangular bars of height 1, 3.8 and 1.6 and correct width of 15, 5, 10 with no gaps.

Q28 (a) (i) 7 (ii) 17 (b) (i) 64 (ii) 40 (iii) 1.6
 (c) 9.9

Q29 (a) (i) 3.2 (ii) 4.2 (iii) 4.6 (iv) 196
 (b) (i) 100, 46, 12 (ii) 4

Q30 (a) 171.25 (b) $160 < x \leq 165$
 (c) Block with heights of 1.8, 1.2 and 1 with no gaps.

Q31 (a) (i) 14 (ii) 8 (iii) 30 - then (ii)
 (b) $\frac{11}{80}$ (c) 16, 4 (d) 18.1

(c) correct width with no gaps.
 2nd block $w = 5$, $fd = 2.4$
 3rd block $w = 15$, $fd = 1.2$
 4th block $w = 10$ and $fd = 1.6$
 5th block $w = 10$ and $fd = 0.4$

Answers

Q32 (a) 24.7

(b) (i) 50, 90, 114

(ii) Correct curve.

(iii) 21.5 to 23

15 to 16.5

24 to 26

(c) (i) 50, 30

(ii) Correct histogram.

Q33 (a) (i) 3.81 (or 3hr 49 min)

(ii) Correct Histogram.Q34 (a) (i) $\frac{9}{160}$

(ii) 58.125

(b) 85, 140, 151, 160

(c) Correct curve.

(d) (i) 57 to 59

(ii) 36 to 42

(iii) 92 to 94

(iv) 130 to 137