1 The table gives information about the number of days that 100 cars were in an airport car park.

← total cars

midpoint $\frac{0+4}{2} = 2$

Number of days (d)	mid	Frequency		
$0 < d \leqslant 4$	2	× 16	=	32
$4 < d \leqslant 8$	6	× 18	=	108
$8 < d \leqslant 12$	10	× 19	=	190
$12 < d \leqslant 16$	14	× 27	=	378
$16 < d \leqslant 20$	18	× 20	=	360
		100 ← total cars		1068 ← total days

(a) Write down the modal class.

↳ most frequent class

$12 < d \leq 16$

(1)

(b) Work out an estimate for the mean number of days.

$$\frac{\text{total days}}{\text{total cars}} = \frac{1068}{100}$$

$$= 10.68$$

..... days

(4)

(Total for Question 1 is 5 marks)

Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 80 students entered a dancing competition.

The table gives information about the length of time, in minutes, for which each student spent dancing.

midpoint $\frac{0+12}{2} = 6$

Time (m)	mid Frequency	
$0 < m \leqslant 12$	6×11	$= 66$
$12 < m \leqslant 24$	18×25	$= 450$
$24 < m \leqslant 36$	30×23	$= 690$
$36 < m \leqslant 48$	42×15	$= 630$
$48 < m \leqslant 60$	54×6	$= 324$
	80	2160

Work out an estimate for the mean length of time the students spent dancing.

$$\frac{\text{total time}}{\text{total students}} \qquad \frac{2160}{80} = 27 \text{ minutes}$$

..... minutes

(Total for Question 1 is 4 marks)

1 The table shows information about the frame size, in cm, of 60 bicycles sold in a shop.

Frame size (S cm)	Frequency
$30 < S \leqslant 36$	4
$36 < S \leqslant 42$	14
$42 < S \leqslant 48$	18
$48 < S \leqslant 54$	19
$54 < S \leqslant 60$	5

mid

33x 4 = 132

39x 14 = 546

45x 18 = 810

51x 19 = 969

57x 5 = 285

60 2742

midpoint

$\frac{30+36}{2} = 33$

(a) Write down the modal class.

↳ most frequent group

$48 < S \leq 54$

(1)

(b) Work out an estimate for the mean frame size.

$\frac{\text{total size}}{\text{total bikes}} = \frac{2742}{60} = 45.7$ cm

..... cm

(4)

(Total for Question 1 is 5 marks)

Answer all TWENTY questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The table shows information about the weights, in kg, of 40 parcels.

midpoint
$\frac{0+1}{2} = 0.5$

Weight of parcel (p kg)	mid	Frequency	
$0 < p \leqslant 1$	$0.5 \times$	19	$= 9.5$
$1 < p \leqslant 2$	$1.5 \times$	12	$= 18$
$2 < p \leqslant 3$	$2.5 \times$	5	$= 12.5$
$3 < p \leqslant 4$	$3.5 \times$	2	$= 7$
$4 < p \leqslant 5$	$4.5 \times$	2	$= 9$
		40	56

(a) Write down the modal class.

↳ most frequent group

$0 < p \leq 1$

(1)

(b) Work out an estimate for the mean weight of the parcels.

$\frac{56}{40} = 1.4$

..... kg

(4)

(Total for Question 1 is 5 marks)

Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The table shows information about the heights, in cm, of 48 sunflowers in a garden centre.

Height of sunflower (h cm)	Frequency
$90 < h \leqslant 100$	8
$100 < h \leqslant 110$	12
$110 < h \leqslant 120$	15
$120 < h \leqslant 130$	10
$130 < h \leqslant 140$	3

95 × 8 = 760
105 × 12 = 1260
115 × 15 = 1725
125 × 10 = 1250
135 × 3 = 405
48
5400

Work out an estimate for the mean height of the sunflowers.

$\frac{5400}{48} = 112.5$

.....cm

(Total for Question 1 is 4 marks)

Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The table shows information about the lengths, in minutes, of 50 telephone calls.

Length of telephone call (m minutes)	Frequency
$0 < m \leqslant 5$	8
$5 < m \leqslant 10$	2
$10 < m \leqslant 15$	6
$15 < m \leqslant 20$	4
$20 < m \leqslant 25$	12
$25 < m \leqslant 30$	18

2·5x = 20
7·5x = 15
12·5x = 75
17·5x = 70
22·5x = 270
27·5x = 495
945

(a) Write down the modal class.

$25 < m \leq 30$

(1)

(b) Work out an estimate for the total length, in minutes, of these telephone calls.

↳ not mean

945

..... minutes

(3)

(Total for Question 1 is 4 marks)

Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The table shows some information about the hourly rates of pay of 60 workers.

Hourly rate of pay (p dollars)	Frequency	mid	
$10 < p \leqslant 15$	18	12·5 ×	= 225
$15 < p \leqslant 20$	16	17·5 ×	= 280
$20 < p \leqslant 25$	14	22·5 ×	= 315
$25 < p \leqslant 30$	8	27·5 ×	= 220
$30 < p \leqslant 35$	4	32·5 ×	= 130
	60		1170

(a) Write down the modal class.

$10 < p \leq 15$

(1)

(b) Work out an estimate for the mean hourly rate of pay of the 60 workers.

$\frac{1170}{60} = 19.5$

..... dollars

(4)

(Total for Question 1 is 5 marks)

2 The table gives information about the amount of money, in £, that Fiona spent in a grocery store each week during 2019

Amount spent (£x)	Frequency	
$0 \leqslant x < 20$	5	10 x 5 = 50
$20 \leqslant x < 40$	11	30 x 11 = 330
$40 \leqslant x < 60$	8	50 x 8 = 400
$60 \leqslant x < 80$	19	70 x 19 = 1330
$80 \leqslant x < 100$	9	90 x 9 = 810
		2920

Work out an estimate for the total amount of money that Fiona spent in the grocery store during 2019

↳ not mean

= 2920

£.....

(Total for Question 2 is 3 marks)

2 The table gives information about the number of minutes that Abby spent walking each day in September.

Number of minutes (M)	Frequency
$0 < M \leqslant 30$	5
$30 < M \leqslant 60$	6
$60 < M \leqslant 90$	8
$90 < M \leqslant 120$	9
$120 < M \leqslant 150$	2

15x 5 → 75
45x 6 → 270
75x 8 → 600
105x 9 → 945
135x 2 → 270
2160

Work out an estimate for the total number of minutes that Abby spent walking in September.

not mean

= 2160

..... minutes

(Total for Question 2 is 3 marks)

2 The table shows information about the lengths of time, in minutes, 120 customers spent in a supermarket.

Length of time (L minutes)	Frequency
$20 < L \leqslant 30$	6
$30 < L \leqslant 40$	26
$40 < L \leqslant 50$	31
$50 < L \leqslant 60$	40
$60 < L \leqslant 70$	17

25 x 6 = 150
35 x 26 = 910
45 x 31 = 1395
55 x 40 = 2200
65 x 17 = 1105
120
5760

(a) Write down the modal class.

$50 < L \leq 60$

(1)

(b) Work out an estimate for the mean length of time spent by the 120 customers in the supermarket.

$\frac{5760}{120} = 48$

..... minutes

(4)

(Total for Question 2 is 5 marks)

2 The table gives information about the times, in hours, some students spent doing sport one week.

Time (T hours)	Frequency	
$0 < T \leqslant 2$	5	5
$2 < T \leqslant 4$	9	27
$4 < T \leqslant 6$	24	120
$6 < T \leqslant 8$	40	280
$8 < T \leqslant 10$	7	63
	85	495

Calculate an estimate for the mean time these students spent doing sport.
Give your answer in hours, correct to 1 decimal place.

$$\frac{495}{85} = 5 \cdot 82$$

$$= 5 \cdot 8$$

..... hours

(Total for Question 2 is 4 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

2 The table gives information about the speeds, in kilometres per hour, of 80 motorbikes as each pass under a bridge.

Speed (s kilometres per hour)		Frequency	
$40 < s \leqslant 50$	45 ×	10	= 450
$50 < s \leqslant 60$	55 ×	16	= 880
$60 < s \leqslant 70$	65 ×	19	= 1235
$70 < s \leqslant 80$	75 ×	23	= 1725
$80 < s \leqslant 90$	85 ×	12	= 1020
			5310

(a) Write down the modal class. 80

$70 < s \leq 80$

(1)

(b) Work out an estimate for the mean speed of the motorbikes as they pass under the bridge. Give your answer correct to 3 significant figures.

$\frac{5310}{80} = 66.375$

$= 66.4$

..... kilometres per hour

(4)

(Total for Question 2 is 5 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

3 The table gives information about the amounts of money, in euros, that 70 of Anjali's friends spent last Saturday.

Money spent (S euros)	Frequency	
$0 < S \leqslant 8$	4 x 6	24
$8 < S \leqslant 16$	12 x 14	168
$16 < S \leqslant 24$	20 x 19	380
$24 < S \leqslant 32$	28 x 25	700
$32 < S \leqslant 40$	36 x 6	216
	70	1488

One of Anjali's 70 friends is going to be chosen at random.

(a) Find the probability that this friend spent more than 24 euros last Saturday.

more than 24

$24 < S \leqslant 40$

$25 + 6 = \frac{31}{70}$

.....

(1)

(b) Work out an estimate for the mean amount of money spent by Anjali's friends last Saturday. Give your answer correct to 2 decimal places.

$\frac{1488}{70} = 21.257\ldots$

$= 21.26$

..... euros

(4)

(Total for Question 3 is 5 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

4 The table gives information about the length of time, in minutes, that each of 60 students took to travel to school on Monday.

Length of time (t minutes)	Frequency
$0 < t \leqslant 10$	4
$10 < t \leqslant 20$	10
$20 < t \leqslant 30$	15
$30 < t \leqslant 40$	25
$40 < t \leqslant 50$	6

5 x 4 = 20
15 x 10 = 150
25 x 15 = 375
35 x 25 = 875
45 x 6 = 270
60
1690

(a) Write down the modal class interval.

$30 < t \leq 40$

(1)

(b) Work out an estimate for the mean length of time taken by these 60 students to travel to school on Monday.
Give your answer correct to one decimal place.

$\frac{1690}{60} = 28.1666$

$= 28.2$

..... minutes

(4)

(Total for Question 4 is 5 marks)

4 The table shows information about the weights, in kilograms, of 40 babies.

Weight (w kg)	Frequency
$2 < w \leqslant 3$	12
$3 < w \leqslant 4$	16
$4 < w \leqslant 5$	9
$5 < w \leqslant 6$	2
$6 < w \leqslant 7$	1

2.5x 30
3.5x 56
4.5x 40.5
5.5x 11
6.5x 6.5
40 144

(a) Write down the modal class.

$3 < w \leqslant 4$

(1)

(b) Work out an estimate for the mean weight of the 40 babies.

$\frac{144}{40} = 3.6$

kg

(4)

One of the 40 babies is going to be chosen at random.

(c) Find the probability that this baby has a weight of more than 5 kg.

$5 < w \leqslant 7 \Rightarrow \frac{2+1}{30} = \frac{3}{30}$

(2)

(Total for Question 4 is 7 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

9 The frequency table gives information about the number of points scored by a player.

Number of points	Frequency	
0	13	= 0
1	17	= 17
2	8	= 16
3	x	= 3x
4	11	= 44
	49+x	77+3x

The mean number of points scored is 2

Work out the value of x

$$\text{mean} = \frac{\text{total points}}{\text{total games}}$$

$$\text{mean} = \frac{77+3x}{49+x}$$

$$2 = \frac{77+3x}{49+x}$$

$\times(49+x)$ $\times(49+x)$

$$2(49+x) = 77+3x$$

$$98 + 2x = 77 + 3x$$

$-2x$ $-2x$

$$98 = 77 + x$$

-77 -77

$$21 = x$$

$x =$ .....

(Total for Question 9 is 4 marks)

10 A mathematics teacher at a school asked a group of students how far, in kilometres, each student had travelled to get to school that day.

The table gives information about their answers.

Distance travelled (d km)	Number of students
$0 < d \leqslant 2$	x
$2 < d \leqslant 4$	11
$4 < d \leqslant 6$	8
$6 < d \leqslant 8$	6
$8 < d \leqslant 10$	5

mid: 1 × x = x; 3 × 11 = 33; 5 × 8 = 40; 7 × 6 = 42; 9 × 5 = 45

$x + 30$; $x + 160$

The teacher calculated that an estimate for the mean distance travelled by the whole group of students was 4.25 km.

Work out the value of x.
Show your working clearly.

mean = $\frac{\text{total distance}}{\text{total people}}$

$$4.25 = \frac{x+160}{x+30}$$

$\times(x+30)$ $\times(x+30)$

$$4.25(x+30) = x+160$$

$$4.25x + 127.5 = x + 160$$

-127.5 -127.5

$$4.25x = x + 32.5$$

$-x$ $-x$

$$3.25x = 32.5$$

$$x = \frac{32.5}{3.25} = 10$$

$x =$ .....

(Total for Question 10 is 4 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

13 The frequency table gives information about the numbers of mice in some nests.

Number of mice	Frequency	
5	4	= 20
6	13	= 78
7	16	= 112
8	x	= 8x
9	6	= 54
	39 + x	264 + 8x

The mean number of mice in a nest is 7

Work out the value of x.

$$7 = \frac{264 + 8x}{39 + x}$$

$\times(39+x)$ $\times(39+x)$

$$7(39+x) = 264 + 8x$$

$$273 + 7x = 264 + 8x$$

$-7x$ $-7x$

$$273 = 264 + x$$

-264 -264

$$9 = x$$

$x =$ .....

(Total for Question 13 is 4 marks)