1)

A class of 30 students counted the number of books in their bags on a certain day. The number of books in EACH bag is shown below.

5	4	6	3	2	1	7	4	5	3
6	5	4	3	7	6	2	5	4	5
5	7	5	4	3	2	1	6	3	4

(a) Copy and complete the frequency table for the data shown above.

Number of Books (x)	Tally	Frequency (f)	$f \times x$
1	II	2	2
2	III	3	6
3			
4			
5			
6			
7			

(4 marks)

(b) State the modal number of books in the bags of the sample of students. (1 mark)

(c) Using the table in (a) above, or otherwise, calculate

(i) the TOTAL number of books (2 marks)

(ii) the mean number of books per bag. (2 marks)

(d) Determine the probability that a student chosen at random has LESS THAN 4 books in his/her bag. (2 marks)

2) A class of 32 students participated in running a 400m race in preparation for their sports day.

The time in seconds taken by each student is recorded below.

83	51	56	58	62	65	61	64
72	71	54	62	81	80	78	77
71	55	70	54	82	59	71	62
83	65	63	72	78	73	68	75

(a) Copy and complete the frequency table to represent this data.

Time in seconds	Frequency
50 – 54	3
55 – 59	4
60 – 64	6
65 – 69	
70 – 74	
75 – 79	
80 – 84	

(2 marks)

(b) Using the raw scores, determine the range for the data. (2 marks)

(c) Using a scale of 2 cm to represent 5 seconds on the horizontal axis and a scale of 1 cm to represent 1 student on the vertical axis, draw a frequency polygon to represent the data.

NOTE: An empty interval must be shown at each end of the distribution and the polygon closed. (6 marks)

(d) To qualify for the finals, a student must complete the race in less than 60 seconds. What is the probability that a student from this class will qualify for the finals? (2 marks)

3)

The heights of a sample of seedlings were measured to the nearest centimetre and then arranged in class intervals as shown in the table below.

Height in cm	Midpoint	Frequency
3–7	5	0
8–12	10	3
13–17	15	12
18–22		16
23–27		22
28–32		18
33–37		14

(a) How many seedlings were in the sample? (1 mark)

(b) For the class interval written as "8–12" in the table above, write down

    (i) the lower class limit (1 mark)

    (ii) the upper class boundary (1 mark)

    (iii) the class width. (1 mark)

(c) Copy and complete the table by inserting

    (i) the midpoints of EACH class interval (2 marks)

    (ii) the missing values for the class interval after the interval "33–37". (1 mark)

(d) Using a scale of 2 cm to represent 5 cm on the horizontal axis and 2 cm to represent 5 seedlings on the vertical axis, draw a frequency polygon to represent the data as shown in your table at (c). (5 marks)

4)

A class of 24 students threw the cricket ball at sports. The distance thrown by each student was measured to the nearest metre. The results are shown below.

22	50	35	52	47	30
48	34	45	23	43	40
55	29	46	56	43	59
36	63	54	32	49	60

(a) Copy and complete the frequency table for the data shown above.

Distance (m)	Frequency
20 – 29	3
30 – 39	5
_____	_____
_____	_____
_____	_____

(3 marks)

(b) State the lower boundary for the class interval 20 – 29. (1 mark)

(c) Using a scale of 1 cm on the x-axis to represent 5 metres, and a scale of 1 cm on the y-axis to represent 1 student, draw a histogram to illustrate the data. (5 marks)

(d) Determine

    (i) the number of students who threw the ball a distance recorded as 50 metres or more (1 mark)

    (ii) the probability that a student, chosen at random, threw the ball a distance recorded as 50 metres or more. (1 mark)

5)

A class of 26 students each recorded the distance travelled to school. The distance, to the nearest km, is recorded below:

21	11	3	22	6	32	22	18	28
26	16	17	34	12	25	8	19	14
39	17	22	24	30	18	13	23	

(a) Copy and complete the frequency table to represent this data.

Distance in kilometres	Frequency
1 - 5	1
6 - 10	2
11 - 15	4
16 - 20	6
21 - 25	
26 - 30	
31 - 35	
36 - 40	

(2 marks)

(b) **Using a scale of 2 cm to represent 5 km** on the horizontal axis and a **scale of 1 cm to represent 1 student** on the vertical axis, draw a histogram to represent the data.
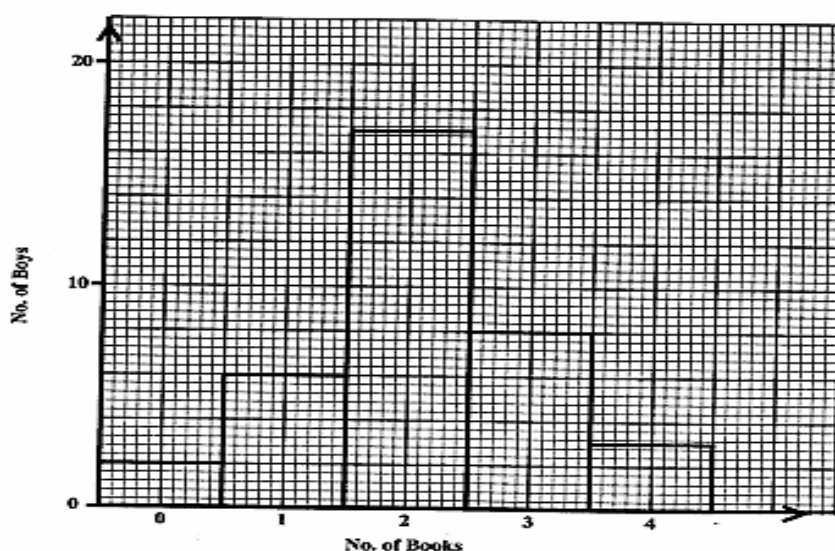
(5 marks)

(c) Calculate the probability that a student chosen at random from this class recorded the distance travelled to school as 26 km or **more**. (2 marks)

6)

In a survey, all the boys in a Book Club were asked how many books they each read during the Easter holiday. The results are shown in the bar graph below.

(a) Draw a frequency table to represent the data shown in the bar graph. (3 marks)

(b) How many boys are there in the Book Club? (2 marks)

(c) What is the modal number of books read? (1 mark)

(d) How many books did the boys read during the Easter holiday? (2 marks)

(e) Calculate the mean number of books read. (2 marks)

(f) What is the probability that a boy chosen at random read THREE OR MORE books?
(2 marks)

7)

The table below shows the amount, to the nearest dollar, spent by a group of 40 students at the school canteen during a period of one week.

Amount Spent ($)	Number of Students	Cumulative Frequency
1 – 10	3	3
11 – 20	7	10
21 – 30	9	19
31 – 40	11	
41 – 50	8	
51 – 60	2	

(a)   Copy and complete the table to show the cumulative frequency.   **(2 marks)**

(b)   Using a scale of **1 cm to represent $5 on the horizontal axis** and **1 cm to represent 5 students on the vertical axis**, draw the cumulative frequency graph for the data.
          (5 marks)

          (Marks will be awarded for axes appropriately labelled, points correctly plotted, and a smooth curve carefully drawn.)

(c)   Use your graph to estimate

          (i)   the median amount of money spent   **(2 marks)**

          (ii)   the probability that a student chosen at random spent less than $23 during the week.   **(2 marks)**

          Show on your graph, using broken lines, how these estimates were determined.

8)

The table below shows the ages, to the nearest year, of the persons who visited the clinic during a particular week.

Age (yrs)	Number of persons	Cumulative Frequency
40 – 49	4	4
50 – 59	11	15
60 – 69	20	—
70 – 79	12	—
80 – 89	3	50

(a)   Copy and complete the table to show the cumulative frequency.   **(2 marks)**

(b)   **Using a scale of 2 cm to represent 10 years on the *x*-axis and 1 cm to represent 5 persons on the *y*-axis**, draw the cumulative frequency curve for the data.   **(5 marks)**

(c)   Use your graph drawn at (b) above to estimate

          (i)   the median age for the data   **(2 marks)**

          (ii)   the probability that a person who visited the clinic was 75 years or younger.
          (2 marks)

          Draw lines on your graph to show how these estimates were obtained.

9)

The table below gives the distribution of heights of 400 female applicants for the Police Service.

Height (cm)	Number of Applicants	Cumulative Frequency
151 - 155	10	10
156 - 160	55	65
161 - 165	105	170
166 - 170	110	280
171 - 175	80	360
176 - 180	30	390
181 - 185	10	400

(a)   Using a horizontal scale of 2 cm to represent a height of 5 cm and a vertical scale of 2 cm to represent 50 applicants, draw a cumulative frequency curve of the heights.

Start your horizontal scale at 150 cm.   (5 marks)

(b)   Use your graph to estimate

    (i)   the number of applicants whose heights are less than 170 cm.   (1 mark)

    (ii)   the median height of applicants.   (2 marks)

    (iii)   the height that 25% of the applicants are less than   (2 marks)

    (iv)   the probability that an applicant selected at random has a height that is no more than 162 cm.   (2 marks)

10)

The table below shows the distribution of marks on a test for a group of 70 students.

Mark	Frequency	Cumulative Frequency
1 – 10	2	2
11 – 20	5	7
21 – 30	9	16
31 – 40	14	
41 – 50	16	
51 – 60	12	
61 – 70	8	
71 – 80	4	70

(a)   Copy and complete the table to show the cumulative frequency for the distribution.
                    (2 marks)

(b)   (i)   Using a scale of 1 cm to represent 5 marks on the horizontal axis and 1 cm to represent 5 students on the vertical axis, draw the cumulative frequency curve for the scores.   (5 marks)

    (ii)   What assumption have you made in drawing your curve through the point (0,0)?   (1 mark)

(c)   The pass mark for the test is 47. Use your graph to determine the number of students who passed the test.   (2 marks)

(d)   What is the probability that a student chosen at random had a mark less than or equal to 30?   (2 marks)

STATISTICS

Calculate the mean, median, mode, and range of each set of numbers.

1) $\{18,18,63,63,84\}$

2) $\{19,21,29,32,89\}$

3) $\{41,41,41,44,90\}$

4) $\{25,37,39,85,85\}$

5) $\{12,36,64,65,82\}$

6) $\{30,57,59,76,91\}$

7) $\{27,27,49,77,84\}$

8) $\{25,46,62,76,97\}$

9) $\{22,35,58,63,75\}$

10) $\{45,45,47,88,89\}$

Find the mode for the frequency tables:

1)

Scores	Frequency
6	5
7	1
8	9
9	2
10	10
11	12

2)

Scores	Frequency
6	16
7	14
8	2
9	10
10	6
11	1
12	1

3)

Scores	Frequency
2	12
3	8
4	0
5	2
6	2
7	9
8	15
9	6

Find the mean for the frequency tables:

1)

Scores	Frequency	
5	0	
6	13	
7	11	
8	5	
9	6	

Find the median for the frequency tables:

1)

Scores	Frequency
1	9
2	11
3	15
4	1
5	1

2)

Scores	Frequency	
2	5	
3	4	
4	11	
5	12	
6	15	

2)

Scores	Frequency
10	12
11	15
12	15
13	15
14	9
15	11

3)

Scores	Frequency	
2	7	
3	9	
4	6	
5	0	
6	11	
7	3	
8	11	
9	5	

3)

Scores	Frequency
6	0
7	4
8	5
9	8
10	10
11	10