CHAPTER TWELVE

STATISTICS

(Q1) The table given next shows the ages of students admitted in a hospital.

Age/ yrs	10	11	12	13	14	151
Number of Students	5	1	7	10	3	4

(a) Find the model age.

(b) Calculate the mean,

N/B: The term "number of" is the same as frequency.

Soln:

(a) The modal age is 13yrs, since it has the highest frequency of 10.

(b)

Age X	Frequency F	FX
10	5	50
11	1	11
12	7	84
13	10	130
14	3	42
15	4	60

 $\sum F = 30$

 $\sum FX = 377$

Mean =
$$\bar{x} = \frac{\sum FX}{\sum F} = \frac{377}{30} = 12.6.$$

(Q2) The table below shows the distribution of grades of candidates in an examination.

Grade	1	2	3	4	5	6

Frequency	2	3	6	5	4	10

- (a) Using a graph sheet, draw a bar chart for the distribution.
- (b) If all the candidates who obtained above grade 3 were awarded credit, find the probability that a candidate selected at random obtained credit.

Soln:

(c) Calculate the mean to the nearest whole number.

(b) Total number of candidates = total frequency = 2 + 3 + 6 + 5 + 4 + 10 = 30. Number of candidates who obtained above grade 3 = the number of those who obtained grade 4, 5 or 6 = 5 + 4 + 10 = 19.

Since the number of those who obtained above grade 3 were awarded credit, then the number of those who obtained credit = 19.

Probability that a candidate selected at random obtained credit = $\frac{\text{number of those who had credit}}{\text{total number of candidates.}}$

$$=\frac{19}{30}$$

(a)

(c)

Grade	Frequency	FX
Х	F	
1	2	2
2	3	6
3	6	18
4	5	20
5	4	20
6	10	60
	$\Sigma F = 30$	$\sum FX = 126$

Mean = $\bar{x} = \frac{\sum FX}{\sum F} = \frac{126}{30} = 4.2.$

(Q3) The table shows the number of pupils found within a school's various classes.

Class	1	2	3	4	5	6
Number of pupils	24	35	35	20	20	45

(I) Find the number of pupils in the school.

- (II) What is the mean number of pupils in a class?
- (III) Determine the percentage of pupils, formed by those in class six.

Soln:

- (I) The number of pupils in the school = 24 + 35 + 35 + 20 + 20 + 45 = 179
- (II) Total number of pupils in the school = 179.

Total number of classes = 6.

$$=\frac{1}{6}=30$$

- (III) Number of class six pupils = 45. Number of pupils in the school = 179. Percentage formed by class 6 pupils = $\frac{Number \text{ in class 6}}{Number \text{ in the school}} \times 100$ $\frac{45}{179} \times 100 = 25\%$.
- (Q4) (a) The average of the numbers 5, 7, 2, 6, x, (x + 1) and 4 is 5. Find x.

(b) The marks scored by 4 students in a mathematics examination are as follows:

Esi	 	92

- Mary..... 65
- Efua..... x.
- (i)Write down an expression for the mean (average).
- (ii) If the mean is less than 80, write a linear inequality.
- (iii) Find the possible mark scored by Efua.

Soln:

(a) Since their average = 5, then

 $\frac{sum of the numbers}{7} = 5.$ Since 7 numbers are involved,

then
$$\frac{5+7+2+6+x+x+1+4}{7} = 5$$

=> $\frac{25+2x}{7} = 5 => 25 + 2x = 5 \times 7$
=> 25 + 2x = 35,
=> 2x = 35 - 25 = 10,
=> x = $\frac{10}{2} = 5$.

(b) (i) The total marks scored by the 4 students = 92 + 85 + 65 + x = 242 + x.

Since there are 4 students, then their average marks scored = $\frac{242 + x}{4}$

Therefore an expression for the mean or average mark is $\frac{242 + x}{4}$

(ii) If the mean is less than 80, then $\frac{242 + x}{4} < 80$, which is the required linear inequality.

(iii) Since $\frac{242 + x}{4} < 80$

=> 242 + x < 4 x 80, => 242 + x < 320 => x < 320 - 242, => x < 78.

Since x represents the marks scored by Efua, then she scored less than 78 marks.