CBSE
Class XI Economics

Time: 3 hrs **Max. Marks: 80**

General Instructions:

i. **All** questions are **compulsory**.
ii. Marks for questions are indicated against each question.
iii. Question Nos. **1–4** and **13–14** are very short answer questions carrying **1** mark each. They are required to be answered in one sentence.
iv. Question Nos. **5–6** and **15–18** are short answer questions carrying **3** marks each. Answers to them should normally not exceed **60** words each.
v. Question Nos. **7–9** and **19-20** are also short answer questions carrying **4** marks each. Answers to them should normally not exceed **70** words each.
vi. Question Nos. **10–12** and **21–23** are long answer questions carrying **6** marks each. Answers to them should normally not exceed **100** words each.
vii. Answers should be brief and to the point, and the above word limits should be adhered to as far as possible.

SECTION A: Introductory Microeconomics

1. Ram opens a new factory for which he takes a building on rent. He manages the factory himself. Identify the explicit cost and implicit cost in the given situation. [1]

2. A firm under which of the following forms of market follows price discrimination? [1]
a. Perfect competition
b. Monopoly
c. Oligopoly
d. Monopolistic competition

3. What is AFC? [1]

4. When the supply of a good changes due to change in any factor other than the own price of the good, it is known as: (Choose the correct alternative) [1]
a. Change in supply
b. Expansion in supply
c. Contraction in supply
d. Change in quantity supplied

5. A consumer consumes two Goods X and Y which are priced at Rs 5 each. The combination of the two goods chosen by the consumer is such that the marginal rate of

substitution is 5. Is the consumer in equilibrium? How would a rational consumer react in the given situation? [3]

6. Market for a good is in equilibrium. With the help of a diagram, explain the chain reaction which would take place if there is increase in demand. [3]

7. a. What is economic problem? Why does it arise?
b. State the differences between microeconomics and macroeconomics. [4]

8. Explain the impact of the following on the demand for a commodity: [4]
a. Income of the consumer
b. Future expectations

9. A producer supplies 8 units of a commodity at Rs 10 per unit. If the price elasticity of supply is 1.25, how many units of the commodity will the producer supply at Rs 12 per unit? [4]

10. A consumer consumes two goods. Explain his equilibrium using utility analysis. [6]

11. Explain producer's equilibrium with the help of TR–TC approach. [6]

12. Differentiate between monopoly and monopolistic competition. [6]

SECTION B: Statistics for Economics

13. If every class interval excludes items relevant to its upper limit in a series, then it is called _____. [1]
a. Inclusive series
b. Exclusive series
c. Both a and b
d. None of the above

14. Which of the following expressions is equal to quartile deviation? [1]
a. $\frac{Q_3 - Q_1}{2}$
b. $\frac{Q_1 - Q_3}{2}$
c. $\frac{Q_3 + Q_1}{2}$
d. $\frac{Q_1 + Q_3}{2}$

15. State whether the following statements are true or false with reason. [3]

a. An average alone is sufficient to compare series.
b. Arithmetic mean is not a positional value.
c. Median is unduly affected by extreme observations.

16. Give the meaning of the following: [3]

a. Questionnaire
b. Sample
c. Census

17. Calculate standard deviation, given the following data: [3]

12, 15, 18, 21, 24, 27, 30, 33, 36

18. Explain any three uses of index numbers. [3]

19. A survey conducted in a city shows that 20 families incurred the following expenditure in a day (rupees): [4]

12	14	16	16	17	18	18	20	21	21
23	23	24	25	25	26	27	28	30	33

a. Convert these data in the form of a frequency distribution by using the following class intervals 10–14, 15–19, 20–24, 25–29 and 30–34.
b. How many families spent less than 29 rupees a day?

20. In a city, two different areas were selected for the study. One respondent in each area was asked to rank 10 different types of washing machines. The ranks given by them: [4]

Washing Machines	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
Respondent from Area 1	2	5	8	3	1	9	4	10	7	6
Respondent from Area 2	8	10	3	9	6	2	5	1	7	4

Calculate Spearman's rank correlation coefficient.

21. a. Calculate the mode of the following series using the graphic technique. Counter check the modal value with the formula. [4]

Marks	0–20	20–40	40–60	60–80	80–100
Number of Workers	32	46	58	40	34

b. What is the relationship between mean, median and mode? [2]

22. Calculate the correlation coefficient between X and Y and comment on their relationship: [6]

X	10	14	18	24	30	36
Y	8	12	20	26	28	32

23. Draw 'less than' and 'more than' ogives for the following data:

Weight (in kg)	20–24	25–29	30–34	35–39	40–44	45–49	50–54
Frequency	4	12	16	22	14	10	2

CBSE
Class XI Economics
Solution

SECTION A: Introductory Microeconomics

Answer 1

Explicit cost: Cost of rent of the building

Implicit cost: Cost of managerial services provided by Ram

Answer 2

The correct answer is (b). Price discrimination refers to charging a different price for the same product from different buyers. It is a feature of a monopoly firm.

Answer 3

Average fixed cost (AFC) refers to the fixed cost per unit of output. Algebraically,

$$AFC = \frac{TFC}{Q}$$

Answer 4

The correct answer is option (a). When the supply of a good changes due to change in any factor other than the own price of the good, it is known as change in supply. This leads to shift in the supply curve either rightward or leftward.

Answer 5

According to the indifference curve analysis, a consumer is at equilibrium when

$$MRS_{xy} = \frac{P_x}{P_y}$$

According to the given information,

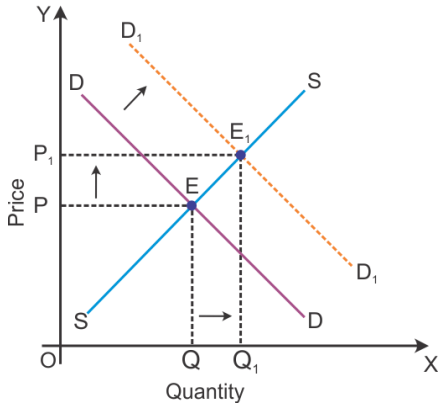
$$MRS_{xy} = 5$$

$$\frac{P_x}{P_y} = \frac{5}{5} = 1$$

$$\text{So, } MRS_{xy} > \frac{P_x}{P_y}$$

To restore equilibrium, the consumer would increase consumption of Good X and reduce consumption of Good Y.

Answer 6



In the diagram, DD is the initial demand curve and SS is the initial supply curve. Point E is the initial equilibrium point where DD intersects SS. Correspondingly, OQ is the equilibrium quantity and OP is the equilibrium price. With the increase in demand, the demand curve shifts parallelly outwards to D_1D_1. However, the supply remains the same. At the existing price, there is excess demand in the market. As a result, the price tends to rise. With the rise in price, the quantity demanded tends to fall, while the quantity supplied tends to rise. This process continues till excess demand is eliminated.

The new equilibrium is established at Point E′ where D_1D_1 intersects SS. Here, both equilibrium price and equilibrium quantity have risen to OP_1 and OQ_1, respectively. However, the rise in price is more than the rise in quantity.

Answer 7

a. Economic problem refers to the problem of allocating resources to different alternative uses in the face of limited means and unlimited wants.

Reasons for economic problem:

i. ***Scarcity of resources***: In every economy, resources are always scarce in relation to the needs and wants. No matter how much resources economy may have, it will not be able to satisfy all the needs. The problem of scarcity of resources cannot be avoided at all.

ii. ***Alternative uses of resources***: Resources are not just scarce in relation to the needs, but they can be put to different alternative uses as well. For example, a piece of land can be used for farming or for the construction of a building. Accordingly, the resources must be managed and put to the best possible use.

b. Differences between microeconomics and macroeconomics:

Microeconomics	***Macroeconomics***
Microeconomics refers to the study of economic problem at the individual or household level.	Macroeconomics refers to the study of economic problem or the problem of choice for the economy as a whole.
It deals with the determination of price and output for an individual firm or industry.	It deals with the determination of general price and aggregate output for the economy as a whole.
It studies partial equilibrium, i.e. it assumes that macro variables remain constant.	It studies general equilibrium, i.e. various variables change simultaneously.

Answer 8

a. ***Income of the consumer***: How the income of the consumer affects the demand depends on the type of good.
   i. Normal goods: For normal goods, as the income of the consumer increases, the demand increases and *vice versa*.
   ii. Inferior goods: In case of inferior goods, with an increase in income, the demand decreases and *vice versa*.

b. ***Future expectations***: Future expectations about the price and availability of the commodity also affect the demand for the commodity. For instance, if the consumer expects that there would be a shortage of the commodity in the future, then he will increase the demand even at the existing price.

Answer 9

Given :

Initial price $(P) = \text{Rs } 10$

Final price $(P_1) = \text{Rs } 12$

Initial Quantity $(Q) = 8$

Price elasticity $(e_s) = 1.25$

Let the final quantity be Q_2

Now,

$$e_s = \frac{P}{Q} \times \frac{\Delta Q}{\Delta P}$$

$$1.25 = \frac{P}{Q} \times \frac{\Delta Q}{\Delta P}$$

$$1.25 = \frac{10}{8} \times \frac{\Delta Q}{(12-10)}$$

$$\Delta Q = 2$$

$$\text{So, final quantity} = (8+2) = 10 \text{ units}$$

Answer 10

According to the utility analysis, if a consumer consumes two goods, then he strikes his equilibrium when the last rupee spent on Good X or Good Y yields the same level of satisfaction.

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = MU_m$$

In other words, a consumer is at equilibrium or derives maximum satisfaction when the rupee worth of marginal utility derived from the two commodities is equal.

This can be better understood with the help of the following example:

Suppose a consumer consumes two commodities *X* and *Y*, both priced at Rs 5 per unit. He has a total of Rs 140 with him. The marginal utility schedule of the two commodities is given below:

Units	**Marginal Utility of X (utils)**	**Marginal Utility of Y (utils)**
1	30	40
2	25	35
3	20	28
4	15	20
5	10	10
6	0	0

The consumer would strike equilibrium at the point where

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$$

Now, because the price of the two commodities is equal, the equation becomes

$MU_x = MU_y$

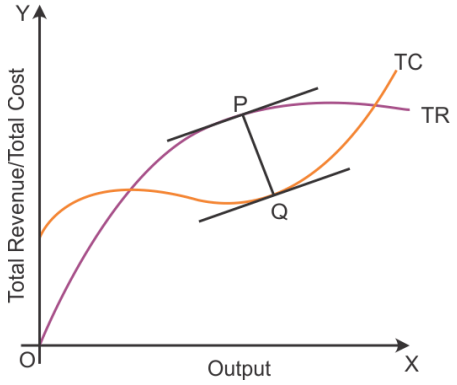
The consumer strikes equilibrium where he consumes 3 units of Commodity X and 4 units of Commodity Y, where the marginal utility of both commodities is equal to 20.

Answer 11

According to the TR–TC approach, a producer strikes equilibrium at the point where the difference between total revenue and total cost is maximum, or in other words, where the total profits are maximised.

This corresponds to the situation of marginal revenue equal to marginal cost and rising marginal cost.

This can be understood with the help of the following diagram:



According to the diagram, TR and TC are the total revenue and total cost curve, respectively. The difference between the two is maximised at PQ.

Note that at this point, the slope of TR, i.e. MR (as given by tangent at Point P) is equal to slope of TC, i.e. MC (as given by tangent at Point P).

Moreover, at Point Q, TC is increasing at an increasing rate. So, MC is rising at this point.

Answer 12

Monopolistic Competition	***Monopoly***
There are a large number of buyers and sellers.	There is a single seller against a large number of buyers.
The entry of new firms in the market is not restricted.	There is restriction to the entry of new firms.
A firm under monopolistic competition faces a relatively more elastic demand curve.	The demand curve faced by the firm is relatively less elastic.
A single firm has only partial control over the price.	The monopolist has complete control over the price.
Due to differentiated products, selling costs are highly essential.	No selling costs are required under monopoly.
In the long run, a firm under monopolistic competition earns normal profits.	In the long run, a monopoly firm earns super normal profits.

SECTION B: Statistics for Economics

Answer 13

The correct option is **(b)**. If every class interval excludes items relevant to its upper limit in a series, then it is called an **exclusive series**. This is because a frequency of the upper limit of each class interval is not included in that class.

Answer 14

The correct answer is **(a)**. Quartile deviation (QD) is the average of the difference between two quartiles, i.e. Q_3 and Q_1. Hence, QD = $\frac{Q_3 - Q_1}{2}$.

Answer 15

a. The statement is **False**. An average indicates only the behaviour of a particular series which is insufficient. The measure of dispersion reflects the quantum of variation in values. This implies that the measure of dispersion gives the extent to which values in a distribution differ from the average of the distribution.
b. The statement is **True.** Arithmetic mean is not a positional value as it is based on all observations. Median and mode are calculated by identifying the position at which they lie, i.e. the corresponding value at this position is the value of the median or mode.
c. The statement is **False.** Median is unduly affected by extreme observations is not valid. The arithmetic mean is affected by extreme values, and any large value on either side can push it backward or forward.

Answer 16

a. A questionnaire contains several questions relevant to the field of investigation. The construction of a questionnaire is a specific art which requires a great deal of skill and practice.
b. A sample is a group of items from the Universe where the selected sample should represent the characteristics of the Universe. It follows a set of technical procedures to select a representative sample from the Universe.
c. A census covers every item of the Universe pertaining to the problem of investigation. This helps understand the diverse characteristics of the Universe.

Answer 17

X	$x = (x - \bar{X})$ $\bar{X} = 24$	x^2
12	–12	144
15	–9	81
18	–6	36
21	–3	9
24	0	0
27	3	9
30	6	36
33	9	81
36	12	144
$\sum X = 216$		$\sum x^2 = 540$

$$\text{Mean } (\bar{X}) = \frac{\sum X}{N} = \frac{216}{9}$$

$$\therefore \boxed{\text{Mean } (\bar{X}) = 24}$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum x^2}{N}} = \sqrt{\frac{540}{9}}$$

$$\therefore \boxed{\text{Standard Deviation } (\sigma) = 7.74}$$

Answer 18

Uses of index number

i. **Barometer of economic activity:** Index number serves as a barometer for measuring the value of money. This helps compare the value of money for different years and thus can help feel the pulse of the economy.

ii. **Useful to government in formulating policies:** A change in the value of money has direct impact on the public. Thus, the government formulates fiscal and monetary policies based on the result of index numbers.

iii. **Useful to fix wages:** A revision in the money wage occurs in accordance with a proportionate change in the cost of living. Thus, the government revises wages based on the cost of living index number.

Answer 19

a. Frequency distribution:

Expenditure	Tally Bars	No. of Families
10 - 14	ll	2
15 - 19	lll	5
20 - 24	llll l	6
25 - 29	lll	5
30 - 34	ll	2
		$\sum f = 20$

b. Families spending less than Rs 29 per day = 2 + 5 + 6 + 5 = 18

Percentage of families spending less than Rs 29

$$= \frac{\text{Families spending less than Rs 29}}{\text{Total families}} \times 100$$

$$= \frac{18}{20} \times 100 = 90$$

Hence, 90% of the families spend less than Rs 29 per day.

Answer 20

Rank Correlation

Rank R_1	**Rank R_2**	**$D = R_1 - R_2$**	**D^2**
2	8	−6	36
5	10	−5	25
8	3	5	25
3	9	−6	36
1	6	−5	25
9	2	7	49
4	5	−1	1
10	1	9	81
7	7	0	0
6	4	2	4
N = 10		$\sum D = 0$	$\sum D^2 = 282$

Given that

$N = 10, \sum D^2 = 282$

$$r_k = 1 - \frac{6\sum D^2}{N^3 - N}$$

$$= 1 - \frac{6 \times 282}{10^3 - 10}$$

$$= 1 - \frac{1692}{990}$$

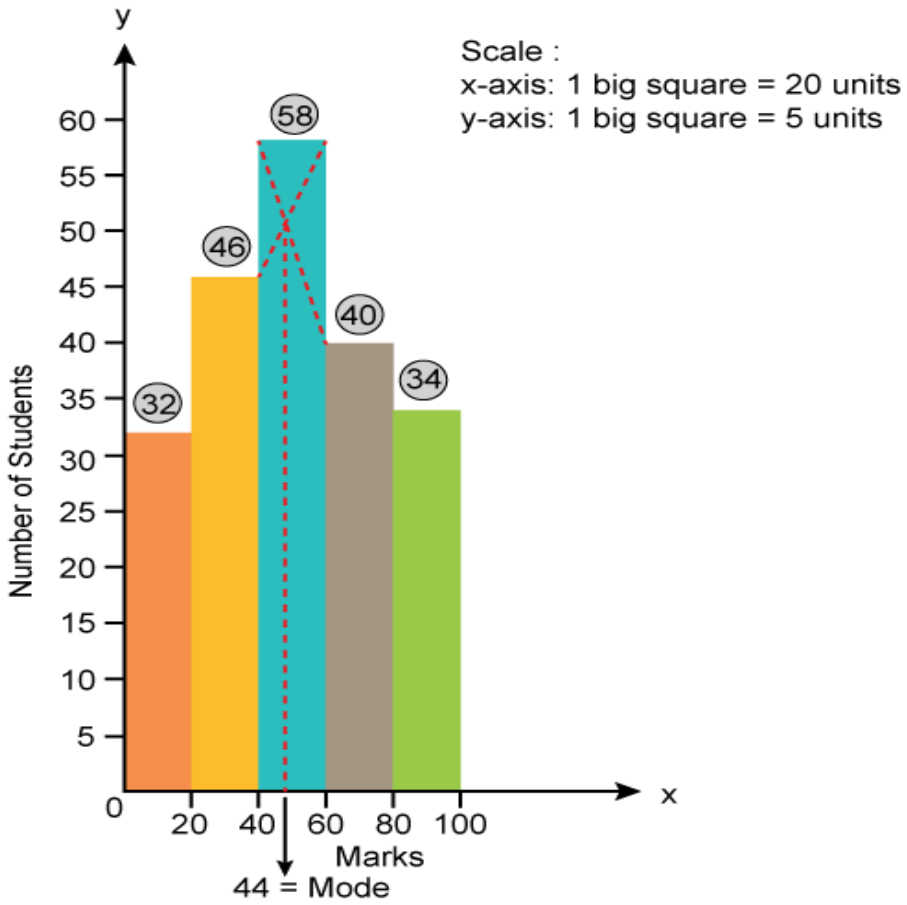
$$= 1 - 1.71$$

$$= 0.71$$

Coefficient of rank correlation (r_k) = 0.71

Answer 21

a. **Calculation of mode through graphical representation**



Wages (In Rs)	No. of Workers (f)
0 – 20	32
20 – 40	46
40 – 60	58
60 – 80	40
80 – 100	34

Modal class is 40-60 as it has the highest frequency.

$$\text{Mode } (Z) = l_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$$

$$Z = 40 + \frac{58 - 46}{2(58) - 46 - 40} \times 10$$

$$Z = 40 + \frac{12}{30} \times 10$$

$$\therefore \boxed{Z = 44}$$

b. The relationship between mean, median and mode is based on the nature of distribution which may be either symmetrical or asymmetrical.

- Symmetrical distribution: Values of mean, median and mode are equal. That is, Mean = Median = Mode
- Asymmetrical distribution: Values of mean, median and mode are different. According to Karl Pearson, the relationship between mean, median and mode is Mode = 3 Median – 2 Mean

Answer 22

X-Series		**Y-Series**		**XY**
X	**X^2**	**Y**	**Y^2**	
10	100	8	64	80
14	196	12	144	168
18	324	20	400	360
24	576	26	676	624
30	900	28	784	840
36	1296	32	1024	1152
$\sum X = 132$	**$\sum X^2 = 3392$**	**$\sum Y = 126$**	**$\sum Y^2 = 3092$**	**$\sum XY = 3224$**

$$r = \frac{\sum XY - \frac{(\sum x)(\sum Y)}{N}}{\sqrt{\sum X^2 - \frac{(\sum x)^2}{N}}\sqrt{\sum Y^2 - \frac{(\sum Y)^2}{N}}}$$

$$= \frac{3224 - \frac{142 \times 126}{6}}{\sqrt{3392 - \frac{(142)^2}{6}}\sqrt{3092 - \frac{(126)^2}{6}}}$$

$$= \frac{3224 - \frac{17892}{6}}{\sqrt{3392 - \frac{20164}{6}}\sqrt{3092 - \frac{15876}{6}}}$$

$$= \frac{3224 - 2982}{\sqrt{3392 - 3360.67}\sqrt{3092 - 2646}}$$

$$= \frac{242}{\sqrt{31.33}\sqrt{446}}$$

$$= \frac{242}{5.60 \times 21.19}$$

$$= \frac{66.67}{118.66}$$

$$= 0.56$$

The correlation coefficient between X and Y is **<u>0.56</u>**. Therefore, there is ***moderate positive relationship between the two variables X and Y***.

Answer 23

If the class intervals are equal but the series are inclusive, then the inclusive series are converted to an exclusive series.

Step 1: Apply the formula to convert to exclusive series

$$\text{Value of Adjustment} = \frac{\text{Value of lower limit of one class} - \text{Value of upper limit of the preceeding class}}{2}$$

$$= \frac{25 - 24}{2} = 0.5$$

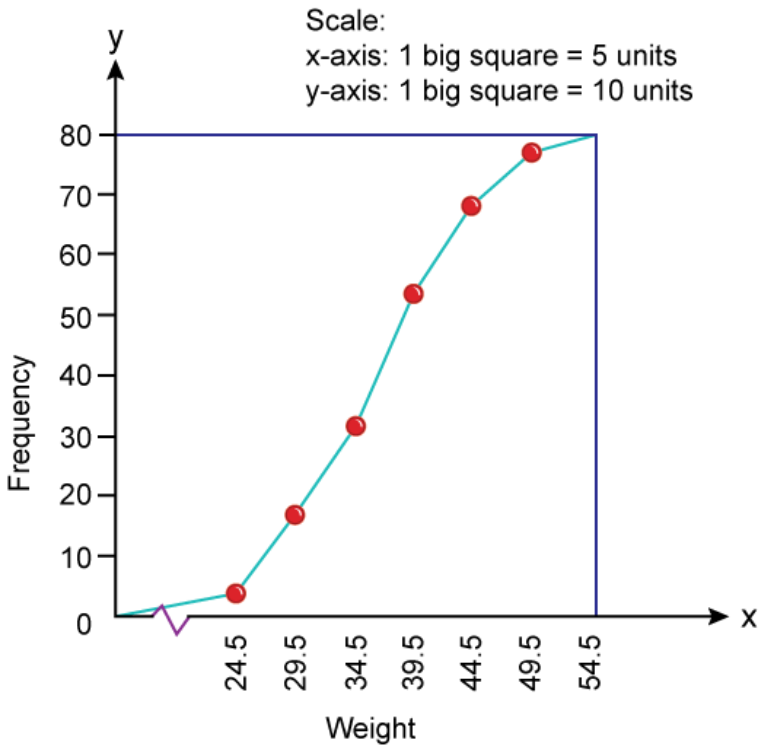
Step 2: Add and subtract 0.5 to each class interval

Weight	Frequency
19.5 – 24.5	4
24.5 – 29.5	12
29.5 – 34.5	16
34.5 – 39.5	22
39.5 – 44.5	14
44.5 – 49.5	10
49.5 – 54.5	2

i. **Less than ogive curve:** In this method, frequencies are cumulated and presented in a graph corresponding to the upper limits of the classes in a frequency distribution. First, all the data are converted to less than cumulative frequency distribution as follows:

Weight	Cumulative Frequency
Less than 24.5	4
Less than 29.5	4 + 12 = 16
Less than 34.5	16 + 16 = 32
Less than 39.5	32 + 22 = 54
Less than 44.5	54 + 14 = 68
Less than 49.5	68 + 10 = 78
Less than 54.5	78 + 2 = 80

This curve is drawn by plotting cumulative frequencies against the upper limit of the class intervals. These points are then joined to obtain the less than ogive curve.



ii. **More than ogive curve:** In this method, frequencies are cumulated and presented in a graph corresponding to the lower limits of the classes in a frequency distribution. First, all the data are converted to more than cumulative frequency distribution as follows:

Weight	Cumulative Frequency
More than 0	80
More than 24.5	80 – 4 = 76
More than 29.5	76 – 12 = 64
More than 34.5	64 – 16 = 48
More than 39.5	48 – 22 = 26
More than 44.5	26 – 14 = 12
More than 49.5	12 – 10 = 2
More than 54.5	2 – 2 = 0

This curve is drawn by plotting cumulative frequencies against the lower limit of the class intervals. These points are then joined to obtain the more than ogive curve.