

CBSE
Class XI Economics
Sample Paper – 2 Solution

SECTION A: Statistics for Economics

Answer 1

Statistics refers to study of statistical methods in singular sense. This indicates the techniques or methods of collecting classifying, presenting, analysing and interpreting the quantitative data.

Answer 2

Tabulation is presenting data in the form of a table, i.e. arranging the data in rows and columns for the requirement of the study.

OR

The correct option is (b). A single number does not constitute Statistics because a conclusion cannot be drawn from such data. It is only the aggregate of data which can be compared and in which conclusions can be drawn. Hence, Statistics is called aggregate of data.

Answer 3

The correct option is (a). If the data of class intervals are unequal, then the width of rectangles will be **different**. The procedure of drawing a histogram differs when class intervals are unequal compared to equal class intervals in a frequency table

Answer 4

Range is the difference between two extreme observations in a distribution. Here, the highest value of range indicates higher dispersion and the lowest value of range indicates lower dispersion in a distribution.

Answer 5

The correct option is (d). Direct personal investigation is costly, time consuming and highly prone to personal bias of the investigator. This method is used only when the researcher possesses appropriate skills and training to conduct a face-to-face interview with respondents.

Answer 6

The correct option is (c). If all the points of the scatter diagram are on a straight line with a positive slope, then it is known as **perfect positive correlation**

Answer 7

The correct option is (b). Frequencies which are cumulated corresponding to the upper limits of the classes in a frequency distribution is known as the less than cumulative frequency.

Answer 8

The correct option is (a). A diagram based on two or more sets of numerical data is known as multiple diagram. It is useful to have a comparative study between two sets of series such as the literacy rate of males and females.

Answer 9

Non-sampling errors are considered more serious because these errors cannot be minimised by an investigator even by taking a large sample.

Answer 10

The bar diagram is the most commonly used which presents data in the form of **bars or rectangles**. It is a **one-dimensional diagram** representing categorical data. This is because only the length of the bars is used for comparative analysis. The bar diagram consists of a group of **equal space and equal width rectangular** bars for each class of data.

Answer 11

In the given distribution, the lower limit of the first class interval and the upper limit of the last class interval are missing. Here, the width of the 2nd, 3rd, 4th class intervals is 40, 60 and 80, respectively. This shows that the width is increasing by 20 in each class interval. Magnitude of a class interval (i) = Upper limit (l_2) – Lower limit (l_1)

Magnitude of the first class interval (i) = $20 - 0 = 20$

Magnitude of the last class interval (i) = $300 - 200 = 100$

Thus, the lower limit of the first class is $20 - 20 = 0$ and the upper limit of the last class is $200 + 100 = 300$.

∴ **Lower limit of first class = 0**

Upper limit of last class = 300

Answer 12

Yes, rank correlation coefficient differs from Pearson correlation coefficient in the following ways:

- Karl Pearson's method of correlation measures correlation for **quantitative data** such as income and savings of the household, while Spearman's method of rank correlation measures correlation for **qualitative data** such as intelligence and beauty of a person.
- Karl Pearson's method of correlation computes the **deviations from actual or assumed mean**, but Spearman's method of rank correlation measures the **differences in rank**.
- Karl Pearson's method of correlation has **high significance to extreme values** as it is based on actual values, while Spearman's method has **low significance to extreme values** as it provides them rank.

OR

Standard deviation is the best measure of dispersion because

- **Comprehensive measure:** It is based on all the items of a series and does not ignore any item of the series.
- **Unaffected by change in sample:** Because the standard deviation is based on all the values, a change in sample has little effect on it.
- **Easy comparison:** It helps in comparing variability among two or more data sets.
- **Independent of origin:** A change of origin does not affect the standard deviation.
- **Algebraic treatment:** It is capable of further algebraic treatment as it does not ignore the signs of deviations in its calculation.

Answer 13

Index of Industrial Production (IIP):

Item	q_0	q_1	$R = \frac{q_1}{q_0} \times 100$	W	RW
Iron and steel	45	108	240	15	3600
Cotton and jute	412	1230	298.54	80	23883.2
Sugar	20	28	140	5	700
				$\sum W = 100$	$\sum RW = 28183.2$

$$IIP = \frac{\sum RW}{\sum W}$$

$$IIP = \frac{28183.2}{100}$$

$$\therefore IIP = 281.83$$

Answer 14

First, the given cumulative frequency is converted to simple frequency to find the frequency of the median class as follows:

Age (in years)	No. of people Frequency (f)	Cumulative frequency (c.f.)
0-10	6	6
10-20	8	14
20-30	16	30
30-40	20	50
40-50	12	62
50-60	8	70
	N = 70	

$$\text{Median} = \text{size of } \left(\frac{N}{2}\right)^{\text{th}} \text{ item}$$

$$\text{Median} = \text{size of } \left(\frac{70}{2}\right) = \text{size of } 35^{\text{th}} \text{ item}$$

35th item lies in cumulative frequency 37 which corresponds to the class interval 30-40.

Thus, median class is 30-40.

$$\begin{aligned} \text{Median} &= l_1 + \frac{\frac{N}{2} - \text{c.f.}}{f} \times i \\ &= 30 + \frac{35 - 30}{20} \times 10 \end{aligned}$$

$$\therefore \text{Median} = 32.5$$

OR

Arranging the data in the ascending order:

48, 52, 60, 64, 75, 78, 82, 88 and 90

$$N = 9$$

$$Q_1 = \text{Size of } \left(\frac{9+1}{4}\right)^{\text{th}} = \text{size of } 2.5^{\text{th}} \text{ item}$$

$$Q_1 = \text{Size of } 2^{\text{nd}} \text{ item} + 0.5 (\text{size of } 3^{\text{rd}} \text{ item} - \text{size of } 2^{\text{nd}} \text{ item})$$

$$Q_1 = 52 + 0.5 (60 - 52)$$

$$\therefore Q_1 = 56$$

$$Q_3 = \text{Size of } 3\left(\frac{9+1}{4}\right)^{\text{th}} = \text{size of } 7.5^{\text{th}} \text{ item}$$

$$Q_3 = \text{Size of } 7^{\text{th}} \text{ item} + 0.5 (\text{size of } 8^{\text{th}} \text{ item} - \text{size of } 7^{\text{th}} \text{ item})$$

$$Q_3 = 82 + 0.5 (88 - 82)$$

$$\therefore Q_3 = 85$$

$$QD = \frac{Q_3 - Q_1}{2}$$

$$QD = \frac{85 - 56}{2}$$

$$\therefore QD = 14.5$$

$$\text{Coefficient of QD} = \frac{Q_3 - Q_1}{Q_3 + Q_1}$$

$$\text{Coefficient of QD} = \frac{85 - 56}{85 + 56}$$

$$\text{Coefficient of QD} = \frac{29}{141}$$

$$\therefore \text{Coefficient of QD} = 0.205$$

Answer 15

a.

Product	p_0	q_0	p_1	q_1	$p_0 q_0$	$p_0 q_1$	$p_1 q_0$	$p_1 q_1$
A	25	9	35	7	225	175	315	245
B	40	6	42	5	240	200	252	210
					$\sum p_0 q_0 = 465$	$\sum p_0 q_1 = 375$	$\sum p_1 q_0 = 567$	$\sum p_1 q_1 = 455$

Laspeyres' index number:

$$\frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100 = \frac{567}{465} \times 100$$

$$= 121.93$$

Paasche's index number:

$$\frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100 = \frac{455}{375} \times 100$$

$$= 121.33$$

The price index number is 121.93 in the current year as compared to 100 in the base year.

This implies that compared to the base year, the prices have risen by 21.93%

(121.93 – 100). Therefore, additional dearness allowance for the household will be 21.93.

b.

Price Index	Quantity Index
i. It measures general changes in prices between current year and base year.	i. It measures average change in quantities and assists to compare changes in physical quantity of commodities produced and consumed.
ii. Two methods to calculate Price Index Number are • Simple aggregative method • Simple average of price relative method	ii. Two methods to calculate Quantity Index Number are • Weighted average of price relative method • Weighted aggregative method
iii. It is also known as unweighted index number.	iii. It is also known as weighted index number.
iv. It considers the prices of the commodity of both base year and current year.	iv. It considers the weights of the commodity assigned according to quantity.

Answer 16

Indian batsman:

X_1	$x_1 = X_1 - 54.1$	x_1^2
82	27.9	778.41
18	-36.1	1303.21
73	18.9	357.21
52	-2.1	4.41

70	15.9	252.81
74	19.9	396.01
58	3.9	15.21
42	-12.1	146.41
38	-16.1	259.21
34	-20.1	404.01
$\Sigma X_1 = 541$		$\Sigma x_1^2 = 3916.9$

$$\bar{X} = \frac{\sum X_1}{n_1} = \frac{541}{10}$$

$$\therefore \boxed{\bar{X} = 54.1}$$

$$\sigma = \sqrt{\frac{\sum x_1^2}{n_1}} = \sqrt{\frac{3916.9}{10}}$$

$$\therefore \boxed{\sigma = 19.79}$$

$$\text{Coefficient of Variation} = \frac{\sigma}{\bar{X}} \times 100 = \frac{19.79}{54.1} \times 100$$

$$\therefore \boxed{\text{Coefficient of Variation} = 36.58}$$

Australian batsman:

X_2	$x_1 = X_1 - 50.5$	x_2^2
30	-20.5	420.25
68	17.5	306.25
32	-18.5	342.25
10	-40.5	1640.25
48	-2.5	6.25
98	47.5	2256.25
101	50.5	2550.25
18	-32.5	1056.25
8	-42.5	1806.25
92	41.5	1722.25
$\Sigma X_2 = 505$		$\Sigma x_2^2 = 12106.5$

$$\bar{X} = \frac{\sum X_2}{n_2} = \frac{505}{10}$$

$$\therefore \boxed{\bar{X}=50.5}$$

$$\sigma = \sqrt{\frac{\sum x_2^2}{n_2}} = \sqrt{\frac{12106.5}{10}}$$

$$\therefore \boxed{\sigma=34.79}$$

$$\text{Coefficient of Variation} = \frac{\sigma}{\bar{X}} \times 100 = \frac{34.79}{55} \times 100$$

$$\therefore \boxed{\text{Coefficient of Variation}=63.25}$$

- i. **Good scorer:** The Indian batsman is a good scorer as his mean runs is 54.1 which is higher than the Australian batsman whose mean runs is 50.5.
- ii. **Consistent player:** The Indian batsman is a consistent player as his coefficient of variation is 36.43, which is lower than the Australian batsman whose coefficient of variation is 63.25.

Answer 17

- a. The sample method gives better results as compared to the census method because
 - i. **Less costly:** The sample method is less costly as only some items of the population are studied rather than all the items of the population.
 - ii. **Time saving:** This method saves a lot of time and energy of the investigator as fewer items of the population are studied.
 - iii. **Easy identification of errors:** Errors under the sampling method can be easily identified and rectified as the number of items is small.
 - iv. **Feasible for large population:** When the size of the population is large, the sampling method is feasible as the cost of conducting the census becomes high.
 - v. **Less non-sampling errors:** The number of non-sampling errors in the sampling method is less because a limited number of items are studied.
- b. Statistical errors are divided into sampling and non-sampling errors.
 - i. **Sampling errors** are relevant to the number of sample and its nature pertaining to the study area. If the number of samples chosen for the study is small in size or the nature of the sample is not responding appropriately, then the computed value may differ from the actual value of the parameter. This is called sampling error. Here, the magnitude of the error can be minimised by taking a large sample size for the study. For example, if the computed value of the parameter is 36 and the true value of the parameter is 48, then
 Sampling error = True value – Computed value
 = 48 – 36 = 12
 - ii. **Non-sampling errors** are relevant to the collection of data. These errors may occur in the following manner:

- Error of measurement may occur if the investigator commits error in measuring the sample such as difference in scale of measurement and procedure followed in rounding the arrived value.
- Error of non-response may occur if the respondent does not provide accurate information for the study.
- Error of misinterpretation may occur if the respondent does not interpret the question given in the questionnaire.
- Error of sampling bias may occur if the concerned study area has a problem in including certain members for the sample.

Although the sample size is large, the non-sampling errors cannot be minimised by the investigator. So, it is clear that non-sampling errors are more serious than sampling errors in the research.

OR

Direct personal investigation, indirect oral investigation, information from local sources and telephonic interviews are the four different methods of collecting primary data.

Direct Personal Investigation

In this method, the researcher or investigator conducts *face to face to interviews with individuals*. Example: If a researcher wants to understand the small investments of vegetable vendors, they meet the vendors in the market to obtain the necessary information.

Merits

- i. High degree of originality of the collected data.
- ii. Reliable and accurate method as the data is first-hand information obtained by the investigator. He has **direct contact** with respondents.

Demerits

- i. Field of investigation is limited and not so large hence it is not suitable when the area of coverage is large.
- ii. Expensive and time consuming method when the field of investigation is large.

SECTION B: Introductory Microeconomics

Answer 18

Cost refers to the expenditure incurred by a producer on the factors and non-factors that is required for producing a given amount of output of a commodity.

Answer 19

Two factors that affect the supply of a commodity are:

1. own price of the commodity-
2. price of the related good

Answer 20

The correct option is (a). On stage 2 where $TP > 0$, $AP > 0$ & $MP > 0$. All factors are fully utilised and productivity of factors is maximum.

Answer 21

The correct option is (c). When production is zero, total cost will be equal to fixed cost. Fixed cost does not change even if production is zero or maximum.

Answer 22

The correct option is (c). Price ceiling means the maximum level of price imposed by the government which is lower than the equilibrium price that can be charged by seller.

Answer 23

Marginal cost refers to the change in total cost per unit increase in output.

OR

The correct option is (a). Movement along the supply curve will be the response to a change in own price of a good while other determinants of the supply will remain constant

Answer 24

Revenue maximisation is not correct in the context of producer's equilibrium. This is because a producer will achieve equilibrium at a particular level of output where profit is maximised. So it is a situation of profit maximisation

Answer 25

The correct answer is (c). Under perfect competition, a firm is a price taker. Accordingly, the price is fixed in the market. So, the AR curve is a horizontal straight line parallel to the x-axis.

Answer 26

Increasing returns to a factor refers to a situation where a proportionate increase in factor of production brings about a more than proportionate increase in output. Here, the total product increases at an increasing rate.

Answer 27

An increase in output affects the behaviour of total variable costs (TVC) because TVC vary directly with the level of output i.e. TVC rise with increase in the output and fall with decrease in the output.

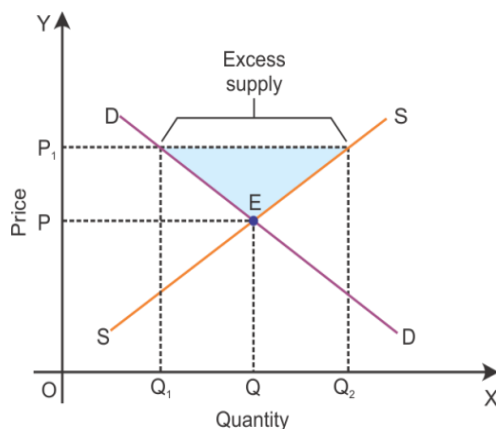
Answer 28

$$P_1 = \frac{80}{8} = 10 \text{ and } Q_1 = 8 \text{ units}$$

$$e_d = (-) \frac{10}{10} \times \frac{2}{0}$$

$$\therefore e_d = \infty$$

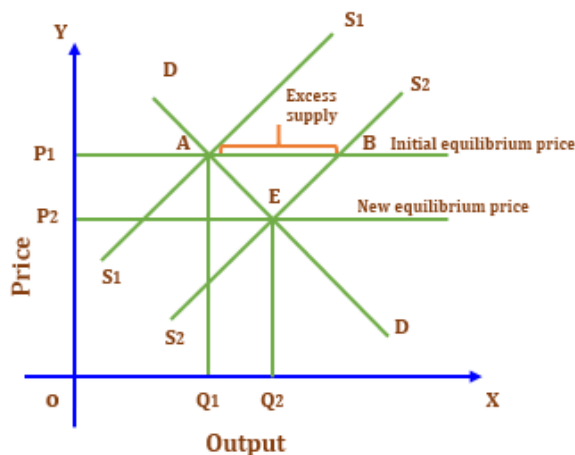
Answer 29



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. Suppose the market price is P_1 which is more than the equilibrium price. At this price, the quantity demanded is OQ_1 and the quantity supplied is OQ_2 . Thus, there is excess supply in the market. This implies that there is excess stock with the producers. To clear the stock, the producers reduce the market price. This reduction in the market price increases the demand (represented by a downward movement along the demand curve). This fall in price, increase in demand and fall in supply will continue till equilibrium Point E is reached and the market is cleared.

OR

Excess supply is a situation where the market demand is less than the market supply at a particular price.



In the above diagram, consider DD to be the initial demand curve and SS to be the supply curve of the market. As we know, the market reaches equilibrium level at point E where the intersection of demand and supply curve occurs. Therefore, the equilibrium price is OP, and the equilibrium quantity demanded is OQ.

When there is change in other factors than price, there will be rise in the supply of goods. There will be a shift in the supply curve towards the right to SS₁ with an increase in the supply, and the demand curve DD will remain the same. This implies that there will be a situation of excess supply at the equilibrium point.

There is an excess supply from point A to B at the initial price OP₁. Thereby the producers will tend to reduce the price of the output to increase the sale in the market. Profit margin of the firm will come down and slowly some of the firms will tend to quit the market. Because of this, the market supply will decline to OQ₂ level of output and the price of the output also gets reduce to the point OP₂. Now, the new market equilibrium will be at Point E₁, where the new supply curve SS₁ intersects the demand curve DD.

Answer 30

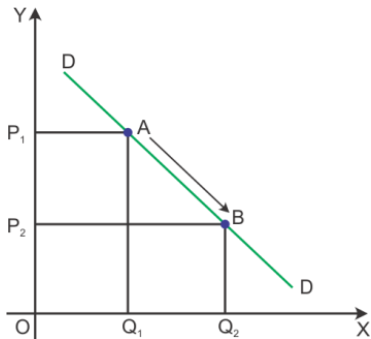
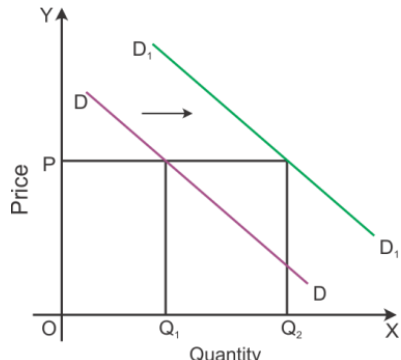
The production possibility curve refers to the curve which presents the alternative combinations of production possibilities of two goods which can be produced with the given resources and the given technology.

The slope of the production possibility curve is indicated by the marginal opportunity or the marginal rate of transformation. Opportunity cost refers to the units of one good which must be sacrificed for each additional unit of the other good.

<i>Good X (units)</i>	<i>Good Y (units)</i>	<i>Opportunity Cost $\frac{\Delta Y}{\Delta X}$</i>
0	10	-
1	8	2
2	5	3
3	1	4

Answer 31

<i>Extension of Demand</i>	<i>Increase in Demand</i>
It refers to a rise in demand for a commodity because of a rise in its own price.	It refers to a rise in demand for a commodity because of factors other than the price.
Fall in price is the only factor which leads to extension of demand.	Factors which cause increase in demand: • Increase in income of the consumer • Rise in price of substitute good • Fall in price of complementary good

	Change in taste and preferences in favour of the good
Diagrammatically, it is depicted by a downward movement along the same demand curve. 	Diagrammatically, it is depicted by a parallel rightward shift of the demand curve. 

Answer 32

According to the MR–MC approach, a consumer strikes equilibrium at the point where the following two conditions are met:

- MR is equal to MC
- MC is rising

The two conditions are met when 4 units of output are produced. At this point, MR and MC are equal to 5.

MR is equal to MC at 2 units of output as well. However, at this point, MC is falling. So, this is not the equilibrium point.

OR

According to the MR–MC approach, the firm reaches equilibrium only when the following conditions are satisfied:

- MR = MC
- MC must be rising after the equilibrium level of output

Output (units)	Total Revenue (Rs)	Total Cost (Rs)	Marginal Revenue (Rs)	Marginal Cost (Rs)	Profit (TR – TC)
1	8	10	-	-	-2
2	16	18	8	8	-2
3	24	23	8	5	1
4	32	31	8	8	1
5	40	41	8	10	-1

The firm is in equilibrium at the output level of 4 units, and MC increases after the 4th unit of output. Thus, the firm's equilibrium level of output to maximise output is $MR = MC$ and MC should be rising at the point of intersection with MR. If there is a decline in the level of output, then the price will exceed the marginal cost. Hence, the firm should increase output to earn high profit. The firm reaches equilibrium only when it produces 4 units of output

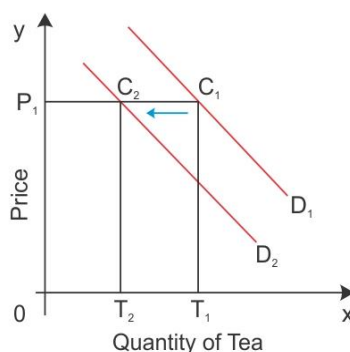
Answer 33

- Nature of commodity:** Elasticity of demand of a commodity depends on the nature of the commodity. Necessities have low price elasticity, i.e. the quantity demanded of necessities does not change much with the change in the price of the commodity. On the other hand, luxuries have high price elasticity, i.e. the quantity demanded is highly responsive to change in price.
- Availability of substitutes:** If a commodity has a large number of close substitutes, then the demand for it would be relatively more elastic. This is because in case of a rise in price, a consumer can easily shift the demand towards the substitutes, thereby highly reducing the quantity demanded.
- Variety of uses:** If a commodity can be put to a large variety of uses, then it will have relatively elastic demand. This is because in case of a rise in price, the use for unnecessary purposes can be reduced, and thereby the total quantity can be reduced.

OR

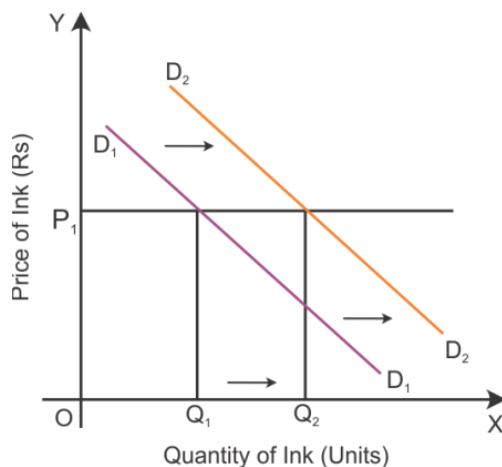
The effect of fall in prices of related goods on demand can be understood as follows:

Substitute good: When the price of one good falls, it becomes cheaper in relation to another good. As a result, one good is substituted for the other good such as coffee and tea. Assume tea and coffee are two substitute goods. D_1 is the demand curve for the demand of tea in diagram.



When there is a decrease in the price of the substitute good coffee, the demand curve for tea shifts to the left even when its price is constant. When the price of tea is OP_1 , the quantity demanded is OT_1 as shown in the diagram. Now, the consumer is willing to buy P_1C_2 quantity of tea which is equal to OT_2 . Thus, the consumer shifts from D_1 to D_2 , consuming less of tea even when the price of tea is constant. This is a situation of backward shift in the demand curve.

Complementary good: Complementary goods are purchased jointly such as ink and ink pens. If there is a decrease in the price of a good, then the demand for another good will increase. So the demand curve shifts parallel to the right, i.e. from D_1D_1 to D_2D_2 .



Answer 34

Under perfect competition, products sold by firms are completely homogeneous. In other words, they are exactly identical to each other in terms of size, shape and colour. Accordingly, the products of various firms are perfect substitutes of each other. Also, there is no need for any kind of selling costs or advertising costs.

The presence of homogeneous products has the following implications:

- i. No single firm can control the market prices. There prevails uniform market price.
- ii. There is absolutely zero product differentiation.
- iii. Because of homogeneity of products, the market price which prevails is the minimum possible.

As against this, under monopolistic competition, there is product differentiation. Product differentiation means that the products sold by different firms are only close substitutes of each other. The products serve the same purpose but differ in terms of certain features such as size, colour, packaging and certain ingredients.

Product differentiation under monopolistic competition has the following implications:

- i. Firms are able to exercise some control over the market price.
- ii. Because a large number of close substitutes are available in the market, the price elasticity of demand is very high.
- iii. A large variety or choice of products is available to consumers.