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. Why does AC continue to decline even when MC is rising? [1]

2. At the point where MR is equal to MC, [1]
a. TR is equal to TC
b. (TR – TC) is maximum
c. TR is maximum
d. TC is zero

3. What is product differentiation? [1]

4. When price falls with rise in output, then the revenue from every additional unit will be less than AR. As a result: (Choose the correct alterative) [1]
a. AR and MR curves coincide in a horizontal straight line parallel to the X-axis
b. TR curve is a positively sloped straight line
c. AR and MR curves slopes downwards from left to right
d. AR curve increases as long as MR curve is greater than AR curve

5. The income of a consumer is Rs 50. He purchases two Goods X and Y, the prices of which are Rs 5 and Rs 10, respectively. Present the budget line with the given information. Also, present the corresponding diagram. [3]

6. What is meant by price floor? Explain its effects with the help of a diagram. [3]

7. What is meant by an increase in demand? What are the factors which cause an increase in demand of a commodity? [4]

8. Complete the following table: [4]

Units of labour	***Average Product***	***Marginal Product***
1	5	-
2	10	-
3	-	8
4	2	-
5	-	3

9. Explain the concept of marginal opportunity cost with the help of a schedule and a diagram. [4]

10. Using the utility analysis, explain how much units of a commodity should a consumer buy at the given price. [6]

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

12. Distinguish between perfect competition and monopoly. [6]

SECTION B: Statistics for Economics

13. Which of the following is called the aggregate of data? [1]

a. Collection of data
b. Statistics
c. Analysis of data
d. Organisation of data

14. What is the formula for calculating mode in case of a continuous series? [1]

15. 'Standard deviation is the best measure of dispersion'. Comment on it. [3]

16. State whether the following statements are true or false: [3]

a. Non-random selection of samples is biased to a certain extent.
b. Large sample study helps minimise non-sampling errors.
c. If the population is literate and spread over a large area, then the telephone survey is the most suitable method of collecting data.

17. Find out the interquartile deviation, quartile deviation and coefficient of quartile deviation of the following series. [3]
Wages of 7 workers in Rupees:
110, 100, 150, 150, 200, 116, 84

18. The Consumer Price Index for June 2005 was 116. The food index was 110 and that of other items was 130. What is the percentage of the total weight given to food? [3]

19. a. Distinguish between univariate and bivariate frequency distribution. [2]
b. 'There is loss of information in classified data'– Do you agree? Comment on it. [2]

20. Find out rank difference correlation with the help of the following data: [4]

X	52	33	40	9	15	65	26	21
Y	15	15	22	4	14	20	9	4

21. Calculate the mean, median and mode of the number of persons per house in a city with the help of the following data: [6]

Number of Persons per Houses	1	2	3	4	5	6	7	8	9	10
Number of Houses	24	112	118	96	60	44	22	14	7	2

22. Calculate standard deviation from the two sets of income distribution of six and seven persons, respectively: [6]

Income distribution-I (Rs)	2200	2400	2600	2700	2800	2900		
Income distribution-II (Rs)	2100	2300	2500	2600	2660	2740	2800	2900

23. The frequency distribution of marks obtained by students in a class test is given below. Draw the more than ogive curve: [6]

Marks	0–10	10–20	20–30	30–40	40–50
Number of Students	3	12	16	11	8

CBSE
Class XI Economics
Solution

SECTION A: Introductory Microeconomics

Answer 1

AC continues to fall even when MC is rising till MC is less than AC.

Answer 2

The correct answer is option (b). At the point where MR is equal to MC, the difference between TR and TC is maximum. This is the point where a firm maximises profit.

Answer 3

Product differentiation refers to slightly differentiating the product size, shape and colour. This is done by firms with the objective of increasing market share.

Answer 4

The correct answer is option (C). When price falls with rise in output, then the revenue from every additional unit will be less than AR. As a result, both AR and MR curves slope downwards from left to right. This is because the firms can increase the volume of sale only by decreasing the sale.

Answer 5

The equation for the budget line is

$P_1X_1 + P_2X_2 = Y$

Substituting the given values

$5X_1 + 10X_2 = 50$

For the budget line, the x-intercept and the y-intercept can be calculated as follows.

x-intercept:

If the consumer spends the entire income on X_1, then he can purchase

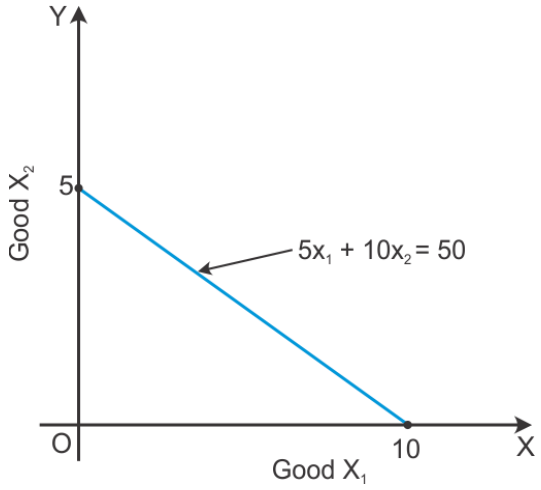
$\frac{50}{5} = 10$ units

y-intercept:

If the consumer spends the entire income on X_2, then he can purchase

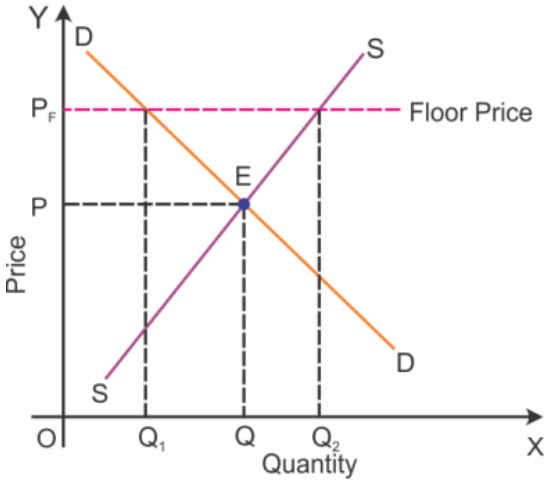
$\frac{50}{10} = 5$ units

So, the budget line can be drawn as follows:



Answer 6

Price floor refers to the minimum price fixed by the government for a commodity. The minimum price as fixed by the government is more than the equilibrium price.



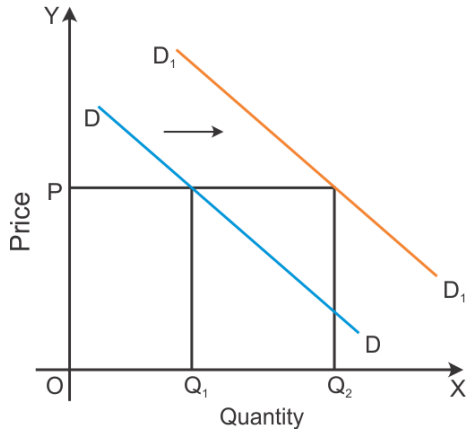
In the diagram, DD is the initial demand curve and SS is the initial supply curve. Point E is the equilibrium point where DD intersects SS. Correspondingly, OQ is the equilibrium quantity and OP is the equilibrium price.

Suppose the government fixes the minimum price at P_f. At this price, the quantity demand is OQ_1 and quantity supplied is OQ_2. That is, there is excess supply in the market. The government purchases this extra stock of the commodity.

Answer 7

Increase in demand refers to an increase in the quantity demanded of a commodity due to factors other than the price of the commodity. In such a situation, the quantity demanded of the commodity increases even when the price of the commodity is constant.

Diagrammatically, it is represented by a parallel rightward shift of the demand curve.



In the given diagram, DD is the initial demand curve. Q_1 quantity of the commodity is demanded at P_1 price. The increase in demand is represented by a parallel rightward shift of the demand curve to D_1D_1. Here, even at the same price, the quantity demanded rises to Q_2.

Factors which cause increase in demand:

i. Increase in income of the consumer
ii. Increase in the price of the substitute good
iii. Fall in price of complementary good
iv. Change in tastes and preferences in favour of the commodity
v. An expectation of the decrease in availability of the commodity in the future

Answer 8

Units of labour	***Average Product***	***Marginal Product***	***Total Product***
1	5	-	5
2	10	15	20
3	4	8	12
4	2	4	8
5	1	3	5

Answer 9

Marginal opportunity cost refers to the number of units of one good which must be sacrificed for the production of each additional unit of the other good. The concept of opportunity cost arises because of the scarcity of resources. Accordingly, to put the resources to one use, they must be withdrawn from the other. Algebraically, marginal opportunity cost is represented as

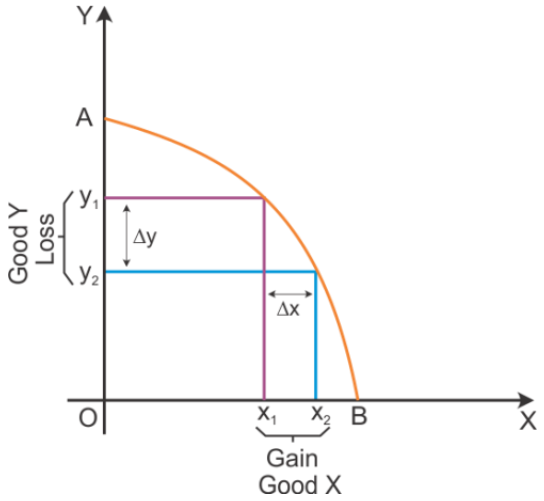
$$\frac{\Delta Y}{\Delta X}$$

The opportunity cost can be understood with the help of the following schedule:

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

Marginal opportunity cost is the slope of the production possibility curve. The marginal opportunity cost is rising which indicates that for the production of each additional unit of Good X, greater units of Good Y must be sacrificed.

Diagrammatically,

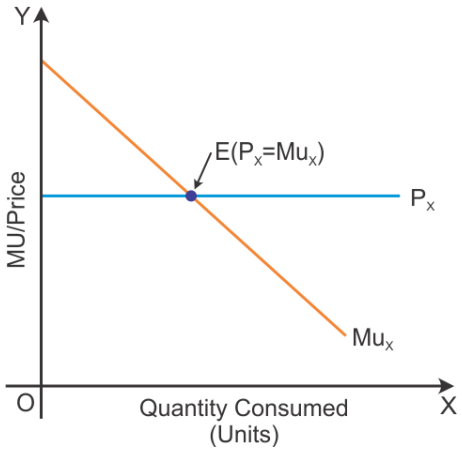


Answer 10

In case a consumer consumes only one commodity, he strikes equilibrium at the point where the rupee worth of satisfaction derived from the consumption of the commodity is equal to the marginal utility of money.

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

Diagrammatically,



In the diagram, MU_x is the marginal utility curve. P_x being constant is a horizontal straight line parallel to the x-axis. The consumer strikes equilibrium at Point E, where MU_x is equal to P_x.

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

Suppose a consumer consumes one commodity X, priced at Rs 3 per unit. Also, the marginal utility of money is 5 utils. The marginal utility schedule of the commodity is as follows:

Units	Marginal Utility of X (utils)
1	20
2	15
3	7
4	1

The consumer would strike equilibrium at the point where

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

This is achievd at 2 units of the commodity

Here,

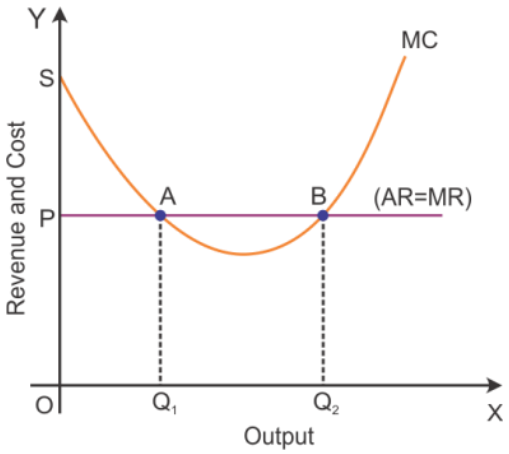
$$\frac{15}{3} = 5 = MU_m$$

Answer 11

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

i. MR = MC
ii. MC is rising

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



In the diagram, AR (demand curve) is a horizontal straight line parallel to axis and is equal to MR. The MC curve is u-shaped. From the diagram, it can be seen that MR is equal to MC at two points—A and B. However, it is only at Point B that the second condition of equilibrium is met, that is MC is rising. Thus, Point B is the equilibrium point. This can be proved as follows:

At Point A:
Total Revenue = Area under MR curve = Area ($OPAQ_1$)
Total Variable Cost = Area under MC curve = Area ($OSAQ_1$)
As Area ($OSAQ_1$) > Area ($OPAQ_1$)
So,
TVC > TR
This implies a situation of loss.
On the other hand, at Point B,
Total Revenue = Area under MR curve = Area ($OPBQ_2$)
Total Variable Cost = Area under MC curve = Area ($OSBQ_2$)
As Area ($OPBQ_2$) > Area ($OSBQ_2$)
So,
TR > TVC
This implies a situation of profit.

Answer 12

Perfect 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.
Firms have perfect knowledge with respect to market conditions.	The monopolist has imperfect knowledge of market conditions.
A firm under perfect competition faces a perfectly elastic demand curve.	The demand curve faced by the firm is relatively less elastic.
A single firm has no control over the price.	The monopolist has complete control over the price.
The average revenue of a firm is equal to its marginal revenue.	The average revenue is more than the marginal revenue.

SECTION B: Statistics for Economics

Answer 13

The correct answer 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 14

Formula to calculate the mode in a continuous series:

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

z – value of the mode

l_1 – lower limit of the modal class

f_1 – frequency of the modal class

f_0 – frequency of the pre-modal class

f_0 – frequency of the post-higher class

i – size of the modal group

Answer 15

Standard deviation is the best measure of dispersion because

i. ***Comprehensive measure***: It is based on all the items of a series and does not ignore any item of the series.

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

Answer 16

a. **The given statement is True.** In the non-random selection of items, every item does not have an equal chance of getting selected in the sample. Thus, there are chances of personal biases in the non-random selection of samples.
b. **The given statement is False.** Non-sampling errors cannot be minimised by taking large samples. In fact, non-sampling errors increase by taking large samples. This is because such errors are related to the collection of data such as measurement error, non-response error and calculation error.
c. **The given statement is False.** A telephone survey is the most suitable when the population is ***illiterate*** and spread over a large area. Under this method, questions are asked from the respondents over the phone, and thus, respondents need not read the questions given in the questionnaire.

Answer 17

Arranging the data in the ascending order:

84, 100, 110, 116, 150, 150 and 200

$N = 7$

$$Q_1 = \text{size of } \left(\frac{7+1}{4}\right)^{th} = \text{size of } 2^{nd} \text{ item}$$

$$Q_1 = \text{size of } 2^{nd} \text{ item} = \text{Rs } 100$$

$$\therefore Q_1 = 100$$

$$Q_3 = \text{size of } 3\left(\frac{7+1}{4}\right)^{th} = \text{size of } 6^{th} \text{ item}$$

$$Q_3 = \text{size of } 6^{th} \text{ item} = \text{Rs } 150$$

$$\therefore Q_3 = 150$$

i. Interquartile Range $= Q_3 - Q_1 = 150 - 100$

$\therefore$ $\boxed{\text{Inter Quartile Range} = 50}$

ii. Quartile Deviation (QD) $= \frac{Q_3 - Q_1}{2}$

$= \frac{150 - 100}{2}$

$\therefore$ $\boxed{QD = 25}$

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

$= \frac{150 - 100}{150 + 100}$

$\therefore$ $\boxed{\text{Coefficient of QD} = 0.2}$

Answer 18

Assume the total weight assigned to food is X and the total weight assigned to other items is (100 – X).

Given that

CPI = 116

$\text{CPI} = \frac{\sum WR}{\sum W}$

By substituting the values in the formula, we get

$116 = \frac{110X + 130(100 - X)}{100}$

$11600 = 110X + 13000 - 130X$

$11600 - 13000 = 110X - 130X$

$-1400 = -20X$

$X = \frac{1400}{20} = 70$

Therefore, the percentage of total weight given to food is 70% and other items is 30%.

Answer 19

a.

Univariate Frequency Distribution	Bivariate Frequency Distribution
The word 'Uni' refers to one.	The word 'Bi' refers to two.
This implies a series of statistical information representing the frequency distribution of one variable.	This implies a series of statistical information representing the frequency distribution of two variables such as production and sales of a particular product.

Examples: Marks of a Class VI student, income of an individual in a particular area	Example: Production and sales of a particular product

b. Yes, there is loss of information in classified data. Frequency distribution summarises the raw data given by making it concise. However, it does not show the details which are found in the raw data and leads to loss of information. As the raw data is grouped into classes, an individual analysis has no significance for further statistical calculation. For example, Class 5–15 has 7 items for analysis (12, 14, 8, 10, 11, 13 and 7) as raw data. Here, the individual observation loses its significance for further statistical calculation because only frequency is recorded but not their actual values. All the values in each class are assumed to be equal to the middle value of the class interval. Statistical calculations are based on the values of the class interval instead of actual values. Thus, the absence of actual values for analysis leads to loss of information.

Answer 20

X	**R_1**	**Y**	**R_2**	**$D = R_1 - R_2$**	**D^2**
52	2	15	3.5	−1.5	2.25
33	4	15	3.5	0.5	0.25
40	3	22	1	2	4
9	8	4	7.5	0.5	0.25
15	7	14	5	2	4
65	1	20	2	−1	1
26	5	9	6	−1	1
21	6	4	7.5	−0.5	0.25
N = 8					$\Sigma D^2 = 13$

15 and 4 are repeated two times in series 2. Thus, $m_1 = 2$ and $m_2 = 2$ and the following formula is used to calculate correlation.

$$r_k = 1 - \frac{6\left[\sum D^2 + \frac{1}{12}\left(m_1^3 - m_1\right) + \frac{1}{12}\left(m_2^3 - m_2\right)\right]}{N^3 - N}$$

$$r_k = 1 - \frac{6\left[13 + \frac{1}{12}\left(2^3 - 2\right) + \frac{1}{12}\left(2^3 - 2\right)\right]}{512 - 8}$$

$$r_k = 1 - 0.166$$

$$\therefore \boxed{r_k = 0.833}$$

Answer 21

No. of Persons per House (X)	No. of House (f)	fx	Cumulative Frequency (c.f.)
1	24	24	24
2	112	224	136
3	118	354	254
4	96	384	355
5	60	300	415
6	44	264	459
7	22	154	481
8	14	112	495
9	7	63	502
10	2	20	504
	$N = \sum f = 499$	$\sum fx = 1899$	

$$\text{Mean } (\bar{X}) = \frac{\sum fx}{\sum f} = \frac{1899}{499}$$

$\therefore \boxed{\text{Mean } (\bar{X}) = 3.805}$

$$\text{Median} = \text{size of } \left(\frac{N+1}{2}\right)^{th} \text{ item}$$

$$\text{Median} = \text{size of } \left(\frac{499+1}{2}\right)^{th} \text{ item}$$

$$\text{Median} = \text{size of } 250^{th} \text{ item}$$

Median value corresponds to the 250^{th} item in the series.

Thus, median value is 3 as it corresponds to cumulative frequency 254.

$\therefore \boxed{\text{Median} = 3}$

Mode is 3 as it has the highest frequency of 118 times.

$\therefore \boxed{\text{Mode} = 3}$

Answer 22

Income distribution I:

X_1	$x_1 = X_1 - \overline{X_1}$	x_1^2
2200	−400	160000
2400	−200	40000
2600	0	0
2700	100	10000
2800	200	
2900	300	90000
$\sum X_1 = 15600$		$\sum x_1^2 = 300000$

$$\overline{X_1} = \frac{\sum x_1}{n_1} = \frac{15600}{6}$$

$$\therefore \overline{X_1} = 2600$$

$$\text{Standard Deviation } (\sigma_1) = \sqrt{\frac{\sum x^2{}_I}{n_1}} = \sqrt{\frac{300000}{6}}$$

$$\therefore \text{Standard Deviation } (\sigma_1) = 707.107$$

Income distribution II:

X_2	$x_2 = X_2 - \overline{X_2}$	x_2^2
2100	−475	225625
2300	−275	75625
2500	−75	5625
2600	25	625
2660	85	7225
2740	165	27225
2800	225	50625
2900	325	105625
20600		$\sum x_2^2 = 498200$

$$\overline{X_2} = \frac{\sum x_2}{n_2} = \frac{20600}{8}$$

$$\therefore \overline{X_2} = 2575$$

$$\text{Standard Deviation } (\sigma_2) = \sqrt{\frac{\sum x^2{}_2}{n_2}} = \sqrt{\frac{498200}{8}}$$

$$\therefore \boxed{\text{Standard Deviation } (\sigma_2) = 249.549}$$

Answer 23

The **ogive curve** is a smooth curve presented by plotting cumulative frequency data on a graph. This can be drawn by understanding the frequencies corresponding to lower limits and upper limits in the distribution of data. Here, all the data are converted to more than cumulative frequency distribution as follows:

Marks	Cumulative Frequency
More than 0	50
More than 10	50 – 8 = 42
More than 20	42 – 11 = 31
More than 30	31 – 16 = 15
More than 40	15 – 12 = 3
More than 50	3 – 3 = 0

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

More than ogive curve