Class 11 - Economics
Sample Paper - 01 (2023-24)

Maximum Marks: 80
Time Allowed: : 3 hours

General Instructions:

1. This question paper contains two sections:

   Section A – Micro Economics

   Section B – Statistics
2. This paper contains 20 Multiple Choice Questions type questions of 1 mark each.
3. This paper contains 4 Short Answer Questions type questions of 3 marks each to be answered in 60 to 80 words.
4. This paper contains 6 Short Answer Questions type questions of 4 marks each to be answered in 80 to 100 words.
5. This paper contains 4 Long Answer Questions type questions of 6 marks each to be answered in 100 to 150 words.

Section A

1. **Assertion (A):** Statistical techniques are used to analyze economic problems of countries like poverty, price control, etc.
   Reason (R): The policy of family planning can be made effective in controlling the population of the country.
   a) Both A and R are true and R is the correct explanation of A.
   b) Both A and R are true but R is not the correct explanation of A.
   c) A is true but R is false.
   d) A is false but R is true.
2. _____ is the ratio of the price of a certain commodity at the current year to its price at the base year.
   a) price index
   b) none of these
   c) price relative
   d) relative price
3. The range of simple correlation coefficient is:
   a) Minus one to plus one
   b) 0 to infinity
   c) 0 to plus one
   d) Minus infinity to infinity
4. Construct price index number from the following data by applying(Fisher's ideal Method

Commodity	Price (2000)	Quantity (2000)	Price (2001)	Quantity (2001)
A	2	8	4	5
B	5	12	6	10
C	4	15	5	12
D	2	18	4	20

   a) 144.5
   b) 147.3
   c) 144.7

d) 147.5

5. If the prices of all commodities in a place have increased 1.25 times in comparison to the base period, the index number of prices of that place is now

 a) 125

 b) 150

 c) 350

 d) None of these

6. If the index number of prices at a place in 1994 is 250 with 1984 as base year, then the prices have increased on average

 a) 450

 b) 350

 c) 250

 d) 150

7. Which limitation of statistics is highlighted in the below example

 In cloth business profit earned in three years is ₹1000, ₹2000 and ₹3000 and in the paper business profit earned is ₹3000, ₹2000 and ₹1000. Both businesses earning the same average profit ₹2000 that shows both have the same economic status. But actually cloth business is making profit and paper business is declining.

 a) Statistics of numerical facts only

 b) Prone to misuse

 c) Study of aggregates only

 d) Without reference result may prove to wrong

8. The most accurate mode of data presentation is:

 a) Diagrammatic method

 b) Textual presentation

 c) None of these

 d) Tabulation

9. Consumer price index numbers are prepared for

 a) Farmers

 b) All people

 c) Factor employees

 d) Well defined section of people

10. Calculate Karl Pearson's coefficient of correlation on the following data:

X	15	18	21	24	27	30	36	39	42	48
Y	25	25	27	27	31	33	35	41	41	45

 a) 0.75

 b) 0.45

 c) 0.89

 d) 0.98

11. Explain four limitations of consumer price index numbers.

12. Calculate the arithmetic mean of marks of 6 students by assumed mean or short-cut method. Marks obtained (X) : 50, 54, 56, 58, 59, 60.

OR

Calculate the mean farm size of cultivating households in a village from the following data.

Farm Size (in acres)	64	63	62	61	60	59
Number of Cultivating Households	8	18	12	9	7	6

13. Convert the following inclusive class interval into an exclusive class interval.

Inclusive Class Interval	Frequency (f)
0-99	2
100-199	4
200-299	5
300-399	6
400-499	3
500-599	5
Total	25

14. Construct the histogram for the following distribution.

Marks Obtained	Number of Students
0-10	6
10-20	10
20-30	26
30-40	22
40-60	10
60-90	9

OR

Draw the 'less-than' and 'more-than' ogive from the data given below

Weekly Wages (in Rs.)	Number of Workers
0-20	10
20-40	20
40-60	40
60-80	20
80-100	10

15. "Secondary data is ready for reference, while primary data has to be collected and processed". Keeping in view the above statement, differentiate between primary data and secondary data.

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16. From the data given below, calculate Karl Pearson's coefficient of correlation between the density of the population and death rate by step deviation method.

Region	Area(in sq km)	Population	Death
A	200	40000	480
B	150	75000	1200
C	120	72000	1080
D	80	20000	280

17. Calculate the value of the median, first quartile (Q_1) and third quartile (Q_3) from the following data.

Marks	Number of Students
30-35	14
35-40	16
40-45	18
45-50	23
50-55	18
55-60	8
60-65	3

OR

Sonia has annual income of Rs 1,00,000 while Mr. Sanju has an annual income of Rs 80, 00,000. The average income of Sonia and Sanju is Rs 45,00,000 per annum. Do you think average income reflects the correct picture of the life of Sonia and Sanju?

Section B

18. In case of increase in supply, we move:
    a) from upper point to lower point of the supply curve
    b) from lower point to upper point of the supply curve
    c) to right on another supply curve
    d) to left on another supply curve

19. A statement which does not offer any suggestion is known as:
    a) normative statement
    b) none of these
    c) positive statement and normative statement
    d) positive statement

20. The concept of supply curve is relevant only for?
    a) Monopoly
    b) Monopolistic competition
    c) Oligopoly
    d) Perfect competition

21. Which of the following statements is appropriate in case of monopoly?
    a) Slope of both AR and MR curves is upwards
    b) Slope of both AR and MR curves is downwards and MR curve is below AR
    c) Slope of both AR and MR curves is downwards and MR curve is above AR curve
    d) AR curve slopes upward while MR curve slopes downward

22. AC and AVC curves never meet each other because
    a) Their difference is AFC is always greater than AC
    b) Their difference is AFC is always greater than zero
    c) Their difference is AFC is always negative
    d) Their difference is MC is always greater than zero

23. **Assertion (A):** A person tends to buy more or less of a commodity.
    Reason (R): Individual person's likes and dislikes tend to change with time.
    a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

24. A firm under perfect competition is a price taker not a price maker due to

a) Supply of identical goods by all sellers

b) Supply of differentiated goods by all sellers

c) Supply of rare goods by all sellers

d) Greater belief in the market forces

25. The Total revenue become negative when

a) TR is constant and maximum

b) TR stops rising at increasing rate

c) Never

d) TR starts rising

26. Average variable costs can be defined as:

a) TVC - Q   b) TVC + Q

c) TVC ÷ Q   d) TVC × Q

27. A competitive firm in the short run incurs losses. The firm continues production, if?

a) P < AVC   b) P=AVC

c) P > =AVC   d) P > AVC

28. Give any three differences between Micro Economics and Macro Economics.

OR

Distingush between positive economics and normative economics.

29. What is meant by a product being perfectly homogeneous? What is its implication for the price charged by producers in the market?

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30. How does change in price of a complementary good affect the demand of the given good? Explain with the help of an example.

31. The following table shows the total revenue and total cost schedules of a competitive firm. Calculate the profit at each output level. Determine also the market price of the good.

Quantity Sold	TR	TC	Profit
0	0	5	
1	5	7	
2	10	10	
3	15	12	
4	20	15	
5	25	23	
6	30	33	
7	35	40	

OR

Is a producer in equilibrium under the following situations?

i. When marginal revenue is greater than marginal cost.

ii. When marginal revenue is equal to marginal cost.

Give reasons for your answer.

32. Explain the conditions of consumer's equilibrium under indifference curve approach.
33. Explain the meaning of increasing returns to a scale and decreasing returns to a scale with the help of total physical product schedule.
34. Answer the following questions
    1. Price Elasticity of Demand of good X is (-2) and of good Y is (-3). Which of the two goods are more price elastic and why?
    2. When price of a good is Rs 13 per unit, the consumer buys 11 units of that good. When price rises to Rs 15 per unit, the consumer continues to buy 11 units. Calculate Price Elasticity of Demand.

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Section A

1. (b) Both A and R are true but R is not the correct explanation of A.

   Explanation: Statistical techniques are used to analyze economic problems of countries like poverty, price control, etc. The policy of family planning can be made effective in controlling the population of the country.

2. (c) price relative

   Explanation: Price Relative = $P1/P0 * 100$.

   Price relative unlike price index takes into account the price of single commodity.

3. (a) Minus one to plus one

   Explanation: The size of correlation coefficient ranges from -1 to +1. This indicates the size of relationship between the variables. When it is +1, there is perfect positive correlation and when it is -1, there is perfectly negative correlation.

4. (b) 147.3

   Explanation:

Commodity	Price (P0)	Quantity (q0)	Price (P1)	Quantity (q1)	P1q0	P0q0	P0q1	P1q1
A	2	8	4	5	32	16	10	20
B	5	12	6	10	72	60	50	60
C	4	15	5	12	75	60	48	60
D	2	18	4	20	72	36	40	80
					251	172	148	220

   $$= \frac{\sqrt{251}}{172} \times \frac{220}{148} \times 100 = 147.3$$

5. (a) 125

   Explanation: According to the question,

   Given : $P_1 = P_0 + 1.25$

   $P_0 P_1 = 2.25$

   We assume base price $P_0 = 100$

   $P_1 = 2.25 \ (100)$

   $P_1 = 225$

   Price of that place = 225

6. (d) 150

   Explanation: Base Year (1984) = 100

   Increased to 250 in 1994

   Hence the overall increment in prices is 250 - 100 = 150

7. (d) Without reference result may prove to wrong

   Explanation: Cloth business shows a rising trend whereas the paper business shows a declining trend corresponding to their years of business respectively.

8. (d) Tabulation

   Explanation: All requisites needed for the presentation of data are satisfied by tabulation only.

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9. (b) All people

   Explanation: A consumer price index (CPI) measures changes in the price level of market basket of consumer goods and services purchased by all the households.

10. (d) 0.98

    Explanation:

X	Y	dX	dY	dX^2	dY^2	$dXdY$
15	25	-15	-8	225	64	120
18	25	-12	-8	144	64	96
21	27	-9	-6	81	36	54
24	27	-6	-6	36	36	36
27	31	-3	-2	9	4	6
30 (A)	33 (A)	0	0	0	0	0
36	35	6	2	36	4	12
39	41	9	8	81	64	72
42	41	12	8	144	64	96
48	45	18	12	324	144	216
	$\sum$	0	0	1080	480	780

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

$$= \frac{10(708) - (0)(0)}{\sqrt{10(480) - (0)^2}\sqrt{10(1080) - (0)^2}} = 0.98$$

11. 1. Errors may occur in the construction because of inaccurate specification of groups for whom the index is meant.

    2. Faulty selection of representative commodities resulting out of unscientific family budget enquiries.

    3. Inadequate and unrepresentative nature of price quotations and use of inaccurate weights.

    4. Frequent changes in demand and prices of the commodity. The average family might not be always a representative one.

12. When using the short cut method, we have to take an assumed mean. Here, let assumed mean A to be equal to 54. Then we have the following table.

Calculation of Arithmetic Mean

S.no.	Marks Obtained (X)	dx (X-A) A=54	
1	50	-4	
2	54	0	-4

3	56	+2	+17
4	58	+4	
5	59	+5	
6	60	+6	
n=6		$\Sigma dx = +13$	

Now, n=6, Σdx=+13 and A=54

Applying the formula of mean, $\bar{X} = A + \frac{\Sigma dx}{n} = 54 + \frac{13}{6} = 54 + 2.17 = 56.17$

Hence, required arithmetic mean =56.17

OR

Here, Farm size is the variable X and the no. of cultivating households is the frequency, f. We have to multiply different values of variable X with their respective frequencies and then find ΣfX. We calculate ΣfX in the table given below.

Calculation of Arithmetic Mean

Farm Size (in acre) (X)	Number of Cultivating Households (f)	fX
64	8	512
63	18	1134
62	12	744
61	9	549
60	7	420
59	6	354
	$\Sigma f = 60$	$\Sigma fX = 3713$

Now applying the formula of mean, we get

$\therefore \quad \bar{X} = \frac{\Sigma fX}{\Sigma f} = \frac{3713}{60} = 61.88 \, acre$

13. To convert the inclusive series into exclusive series

Correction factor = 100-99 /2=0.5

This is added to the upper limit and subtracted from the lower limit of the class.

The exclusive class interval table of a given form is shown below

Inclusive Class Interval	Frequency (f)
0-99.5	2
99.5-199.5	4
199.5-299.5	5
299.5-399.5	6
399.5-499.5	3
499.5-599.5	5
Total	25

In this case, as the lower limit of first class is zero, hence 0.5 will not be subtracted from it.

14.   **Adjustment of Frequencies**

Marks Obtained	Number of Students	Adjustment Factor	Adjusted Frequency
0-10	6	10 ÷ 10=1	6 ÷ 1=6
10-20	10	10 ÷ 10=1	10 ÷ 1=10
20-30	26	10 ÷ 10=1	26 ÷ 1=26
30-40	22	10 ÷ 10=1	22 ÷ 1=22
40-60	10	20 ÷ 10=2	10 ÷ 2=5
60-90	9	30 ÷ 10=3	9 ÷ 3=3

A histogram of unequal class intervals is shown below
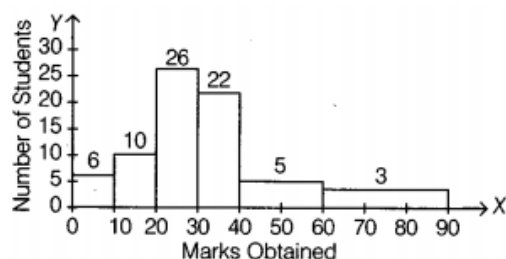
In the above histogram, it can be observed that the frequencies corresponding to classes with lowest class width are not affected.

OR

For less-than and more-than ogives, we will have to prepare less-than and more-than frequency distributions.
In less than method, the frequencies of all the preceding class intervals are added to the frequency of a class.
In more than method, the frequencies of all the succeeding class intervals are added to the frequency of a class.
The computation for both less than and more than ogive is given in the following table.

Less-than Distribution		More-than Distribution	
Weekly Wages (in Rs.)	Number of Workers	Weekly Wages (in Rs.)	Number of Workers
Less than 20	10	More than 0	100
Less than 40	30	More than 20	90
Less than 60	70	More than 40	70
Less than 80	90	More than 60	30
Less than 100	100	More than 80	10

The less-than' and 'more-than ogives of the given data are shown below
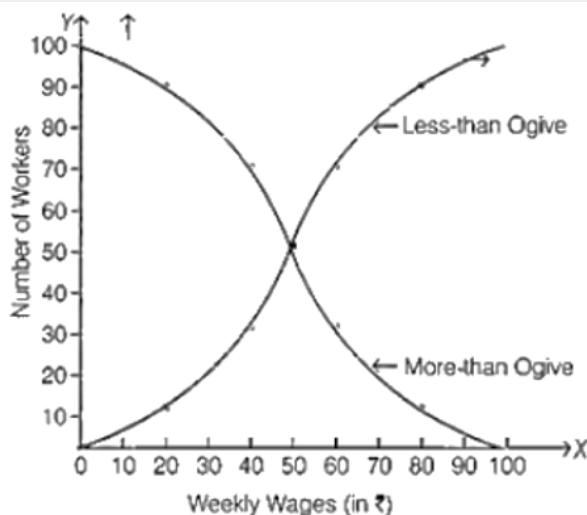
15. The differences between primary and secondary data are:

Basic	Primary Data	Secondary Data
Originality	They are original.	They are not original.
Time and Cost	The collection of primary data requires a lot of manpower, money and time.	This source is relatively cheaper.
Precautions	No precaution is required while using primary data.	It should be used with great care and caution.
Source	They are collected by some agency or person by using the various methods of data collection.	They are already collected and processed by some person or agency and are ready for use.
Organization Factor	Collection of primary data requires elaborate organizational set up.	There is no need for organizational set up in case of secondary data.
Reliability and suitability	Primary data is more reliable and suitable to the enquiry as the investigator himself collects it.	Secondary data is less reliable and less suitable as someone else has collected the data which may not serve the purpose.

16.

Region	Density(X)	dx(X - A), A = 500	$dx'\left(\dfrac{dx}{c_1}\right)$, $c_1 = 50$	dx'^2	Death Rate(Y)	dy(Y - A), A = 16	$dy'\left(\dfrac{dy}{c_2}\right)$, $c_2 = 1$	dy'^2	dx'dy'
A	200	-300	-6	36	12	-4	-4	16	24
B	500	0	0	0	16	0	0	0	0
C	600	100	2	4	15	-1	-1	1	-2
D	250	-250	-5	25	14	-2	-2	4	10
			$\Sigma dx' = -9$	$\Sigma dx'^2 = 65$			$\Sigma dy' = -7$	$\Sigma dy'^2 = 21$	$\Sigma dx'dy' = 32$

Density is calculated as $\dfrac{population}{area}$

Death Rate is calculated as $\dfrac{death}{population} \times 100$

Here, $\Sigma dx' = -9$, $\Sigma dx'^2 = 65$, $\Sigma dy' = -7$, $\Sigma dy'^2 = 21$, $\Sigma dx'dy' = 32$

Now, r = $\dfrac{\Sigma dx' dy' - \dfrac{\Sigma dx' \times \Sigma dy'}{n}}{\sqrt{\Sigma dx'^2 - \dfrac{\left(\Sigma dx'\right)^2}{n}} \times \sqrt{\Sigma dy'^2 - \dfrac{\left(\Sigma dy'\right)^2}{n}}}$

$= \dfrac{32 - \dfrac{(-9 \times -7)}{4}}{\sqrt{65 - \dfrac{(-9)^2}{4}} \times \sqrt{21 - \dfrac{(-7)^2}{4}}}$

$= \dfrac{32 - 15.75}{\sqrt{65 - 20.25} \times \sqrt{21 - 12.25}}$

$= \dfrac{16.25}{\sqrt{44.75} \times \sqrt{8.75}} = \dfrac{16.25}{6.69 \times 2.96} = \dfrac{16.25}{19.80} = 0.82$

- Therefore, Karl Pearson's coefficient of correlation between density of population and death rate is 0.82.
- Interpretation of r: There is a high degree of positive correlation between density of population and death rate.

17.

Marks	Number of Student (f)	Cumulative Frequency (cf)
30-35	14	14
35-40	16	30
40-45	18	48
45-50	23	71
50-55	18	89
55-60	8	97
60-65	3	100
	n=100	

Calculation of First and Third Quartiles and Median

Q_1
First Quartile number $\left(Q_1\right) =$ Size of $\left(\dfrac{n}{4}\right)th\ item$
$= \left(\dfrac{100}{4}\right)$ th item $= 25th\ item$ 25th item will correspond to the class 35-40.   So, $l_1=35$, f=16, cf=14, c=5
$\left(Q_1\right) = l_1 + \left(\dfrac{\dfrac{n}{4} - cf}{f}\right) \times c = 35 + \left(\dfrac{25 - 14}{16}\right) \times 5$ $= 35 + \dfrac{11 \times 5}{16} = 35 + \dfrac{55}{16} = 35 + 3.4$ $=Q_1=38.4$
Q_2 (Median)

Median number (m) = $\left(\dfrac{n}{2}\right)$ th item

$= \left(\dfrac{100}{2}\right)th \ item = 50th \ item$

cf just greater than 50 is 71 and the corresponding class in 45-50.

So, l_1=45, f=23, cf=48 and h=5

$\therefore$ Median (M) = $l_1 + \left(\dfrac{\frac{n}{2} - cf}{f}\right) \times h = 45 + \left(\dfrac{50 - 48}{23}\right) \times 5$

$= 45 + \dfrac{2 \times 5}{23} = 45 + \dfrac{10}{23} = 45 + 0.43 \Rightarrow M = 45.43$

Q₃

Third Quartile number (q₃) = Size of $3\left(\dfrac{n}{4}\right)th$ item

$= \left(\dfrac{3 \times 100}{4}\right)$ th item $= 75th \ item$

75th item will correspond to the class 50-55.

So, l_1=50, f=18, cf=71 and c=5

$\therefore \quad Q_3 = l_1 + \left(\dfrac{\frac{3n}{4} - cf}{f}\right)c = 50 + \left(\dfrac{75 - 71}{18}\right) \times 5$

$= 50 + \dfrac{4 \times 5}{18} = 50 + \dfrac{20}{18} = 50 + 1.1$

$\Rightarrow Q_3 = 51.1$

OR

The average income looks good but in actual there is a huge disparity between the income of Sonia and Sanju. Sonia can hardly meet her regular expenses with a income of rs 100000 while Sanju has huge amount of income which is more than sufficient for him. The average income does not reflect the true picture of their life styles. The value equitable distribution of income and wealth is missing in this case.

Section B

18. (c) to right on another supply curve

    Explanation: Increase in supply refers to a situation when more is supplied at the existing price of the commodity. It leads to a forward shift in the supply curve.

19. (d) positive statement

    Explanation: Positive statements do not reflect any value judgement or opinion of the economists.

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20. (d) Perfect competition

Explanation: The supply curve is relavant only for perfect competition because the price of the product is determined by the market, i.e. the forces of demand and supply. Equilibrium level is acheived when Market demand = Market supply.

21. (b) Slope of both AR and MR curves is downwards and MR curve is below AR

Explanation: Under Monopoly, the firm's average revenue curve slopes downward from left to right. Accordingly, firm's AR curve slopes downward. If AR curve slopes downward, MR curve also slopes downward and faster than AR curve. So that MR<AR.

22. (b) Their difference is AFC is always greater than zero

Explanation: As the output increases, the gap between AC and AVC curves decreases but they never intersect each other. It happens because the vertical distance between them is AFC which can never be zero.

23. (a) Both A and R are true and R is the correct explanation of A.

Explanation: A person tends to buy more or less of a commodity because individual person's likes and dislikes tend to change with time.

24. (a) Supply of identical goods by all sellers

Explanation: In perfect competition , there are large no. of buyers and sellers selling homogeneous products . The goods are pefect substitute for each other due to their homogeneity and because of this reason, no individual buyer or seller can influence the price of the product.

25. (c) Never

Explanation: the total revenue can never become negative as if some qty is sold then some revenue will surely be generated. It can fall but can never become negative. If nothing is being sold, then TR will be zero but not negative.

26. (c) TVC ÷ Q

Explanation: Average variable costs can be defined as TVC ÷ Q.

27. (c) P > =AVC

Explanation: The firm will continue production till its Price or AR >= AVC. The point where its AR or price becomes less than AVC, then they will not continue production as even the variable costs are not met.

28.   i. Microeconomics studies the particular market segment of the economy, whereas Macroeconomics studies the whole economy, which covers several market segments.
   ii. Microeconomics assumes all the macro variables to be constant as national Income, consumption, saving, etc, whereas Macroeconomics assumes that all tile micro variables to be constant as households, firms, prices of Individual products, etc.
  iii. Microeconomics deals with an individual product, firm, household, industry, wages, prices, etc., while Macroeconomics deals with aggregates like national income, national output, price level, etc.

OR

Positive economics is objective and fact based, while normative economics is subjective and value based. Positive economic statements must be able to be tested and proved or disproved. Normative economic statements are opinion based, so they cannot be proved or disproved.

29. A product being perfectly homogeneous implies identical in size, quality, and quantity or identical in all respects. Perfectly homogeneous product is sold in the market at a uniform price. If even an individual firm tries to charge a higher price, it would lose all its buyers to a large number of other sellers, selling a homogeneous product at the prevailing market price. For example in commodities market vegetables, fruits, grains, oil, metals and energy goods are homogeneous goods. The buyers' purchase doesn't depend much upon the product as all are similar but more on the price.

30. Complementary goods are those which are used together for the fulfillment of a demand for example, car and petrol are complimentary to each other. Demand for a given commodity varies inversely with the price of a complimentary good.To explain the demand relation between complimentary goods we will consider two complimentary goods A and B. Change in price of A on demand for B can be studied with respect to the given two conditions

   1. **Price of A rises** When the price of A rises, then it will result in fall in the demand of A, and therefore demand for B will also fall. As a result, demand curve DD will shift leftwards to D_2D_2 from DD.

   2. **Price of A falls** When the price of A falls, then it will result in an increase in the demand of A, and therefore demand for B will also increase. As a result demand curve, DD will shift rightwards to D_1D_1.

Shift in Demand Curve of B
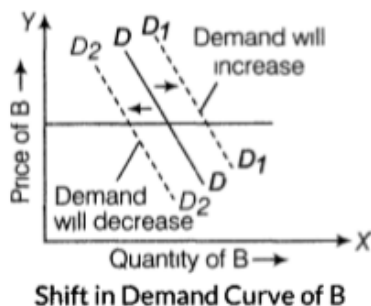
31. Profit = TR - TC

   Average revenue is simply the revenue earned per unit of the output. In simpler words, it is the price of one unit of the output.

Quantity Sold	TR	TC	Profit	AR = $\frac{TR}{Q}$
0	0	5	0 - 5 = -5	-
1	5	7	5 - 7 = -2	$\frac{5}{1} = 5$
2	10	10	10 - 10 = 0	$\frac{10}{2} = 5$
3	15	12	15 - 12 = 3	$\frac{15}{3} = 5$
4	20	15	20 - 15 = 5	$\frac{20}{4} = 5$
5	25	23	25 - 23 = 2	$\frac{25}{5} = 5$
6	30	33	30 - 33 = -3	$\frac{30}{6} = 5$
7	35	40	35 - 40 = -5	$\frac{35}{7} = 5$

OR

   i. a. At this point, where MR>MC both the equilibrium conditions (i) MR = MC (ii) MC should cut MR from below are not satisfied.
   ii. a. The firm will try to be in equilibrium by expanding the output to the level, where MC = MR.
      b. The producer will get either maximum Profits or sets minimum losses at the Point of equality between MR and MC.
      c. At this point of equality of MR and MC, if the second condition of equilibrium is also satisfied only then the producer will be in equilibrium because MR = MC or equality between MR and MC is a necessary but not a sufficient condition of equilibrium.
      d. The producer will be in equilibrium only when the following two conditions are satisfied simultaneously.

     i. MR = MC

     ii. MC should cut MR from below.

32. According to the indifference curve analysis, consumer's equilibrium is at a point where the slope of the indifference curve is equal to the slope of the budget line or the price line.

   The conditions of the consumer's equilibrium are

   i. The given price line should be tangent to an indifference curve or marginal rate of satisfaction of good X for good Y (MRS$_{xy}$) must be equal to the price ratio of the two goods. i.e.MRS$_{xy}$ = $\frac{P_x}{P_y}$, where

     MRS$_{xy}$ = Marginal Rate of Substitution of good X and good Y

     P$_x$ = Price of good X

     P$_y$ = Price of good Y, and

    ii. At the point of equilibrium, the indifference curve must be convex to the origin. It implies that at the point of equilibrium, MRS must be diminishing.
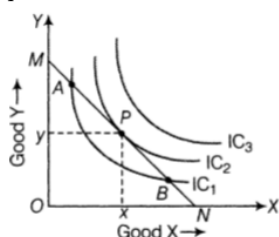
    In the diagram given, P is the equilibrium point at which budget line touches the Indifference Curve IC$_2$.

    iii. The consumer's consumption decision is explained by combining the budget line and the indifference map

33. Increasing returns to scale refers to a situation when the percentage increase in output is greater than the percentage increase in all inputs. For e.g. a 10 % increase in all inputs causes a 20% increase in output.

   Assumption: Input ratio remains constant.

Labour (units)	Capital (units)	Physical output (units)
5	5	100
10	10	300

It is clear from the table that when labour and capital are doubled or are increased by 100% remaining their ratio constant, physical output is more than double (increased by 200%). Hence, the situation of increasing returns. Decreasing returns to scale refers to a situation when the percentage increase in output is less than the percentage increase in all inputs. For example, if a car firm increases its variable inputs (capital, raw materials and labour) by 50%, but the output of cars, increases by only 35%, then we say there are decreasing returns to scale from increasing the number of inputs.

Assumption: Input ratio remain constant.

Labour (units)	Capital (units)	Physical Output (units)
5	5	100
10	10	150

The table shows when labour and capital are doubled (or are increased by 100%) physical output increases only by 50% (from 100-150 units). Hence, the situation of decreasing return to a scale.

34. Answer the following questions

1.
   - Price elasticity of demand is an economic measure of the change in the quantity demanded or purchased of a product in relation to its price change.It measures the responsiveness in demand due to change in its own price of the good.
   - Mathematically it can be expressed as:

   Price elasticity of demand = $\dfrac{ChangeinQuantitydemanded(\Delta Q)}{Change\ in\ Price\ (\Delta P)} \times \dfrac{Price}{Quantity}$

   - Since, there exists an inverse relationship between price and quantity, therefore, either ΔQ or ΔP will be a negative number and because of this elasticity of demand is also a negative number. But while interpreting the result, the negative sign is ignored. So, good Y will be more price elastic than good X because 3 > 2.

2.

Price	Quantity
Given, P = Rs 13 P_1 = Rs 15	Given, Q = 11 units Q_1 = 11 units,
ΔP = P_1 -P =15-13= Rs 2	ΔQ=Q_1 - Q=11-11 = 0

$$E_d = (-)\frac{P}{Q} \times \frac{\Delta Q}{\Delta P} = (-)\frac{13}{11} \times \frac{0}{2} = 0$$

Therefore, E$_{d=0}$ or Demand is perfectly inelastic