B K BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL
ANNUAL EXAMINATION (2024-25)
ECONOMICS (030)
ANSWER KEY

CLASS: XI   **TIME: 3 hrs**
DATE: 18/02/2025   **MAX. MARKS:**
Admission no.:   **Roll No.:**

STATISTICS – 40 MARKS

1. c) ii , iii, iv, v, i   1)

2. c) Statement 1 is true and Statement 2 is false.   1)

3. b) (a) – (ii), (b) – (iv), (c) – (iii), (d) – (i)   1)

4. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)   1)

5. 52.36   kg   1)

6. c) Any one out of (a) and (b)   1)

7. b) 1.5   1)

8. a) 78   1)

9. a) Ranks of series I and series II   1)

10. d) 27.5   1)

11. Functions of statistics;   3)
Statistics helps in simplifying complex data by using various statistical methods
• It presents economic facts in a precise and definite form
• It helps in making comparisons it is used to study the relationship between various economic variables like demand and supply etc.
• It helps in formulating economic plans and policies.

12. A + $\frac{\sum fd'}{\sum f}$ X C   25 + (-14)/28 X 10 = 25 – 5 = 20 Answer   3)

<center>OR</center>

Wage rate (₹)	Mid value $m = \dfrac{l_1 + l_2}{2}$	Frequency (f)	Deviation $(d = m - A)$ $(A = 44.5)$	Step-deviation $d' = d / c$ $(C = 10)$	fd'
19.5-29.5	24.5	20	−20	−2	−40
29.5-39.5	34.5	10	−10	−1	−10
39.5-49.5	44.5A	6	0	0	0
49.5-59.5	54.5	4	10	1	4
59.5-69.5	64.5	5	20	2	10
		$\Sigma f = 45$			$\Sigma fd' = -36$

$$\overline{X} = A + \frac{\Sigma fd'}{\Sigma f} \times C = 44.5 + \left(\frac{-36}{45} \times 10 \right) = 44.5 - 8 = 36.5$$

Thus, arithmetic mean = ₹ 36.5

13. The time available for respondents while answering questions is limited in the Schedule method when compared to the Questionnaire method.   4)
In Questionnaires, responses are filled by the respondents. In Schedule, method responses are filled by the enumerators themselves.
Questionnaire technique is quantitative. Schedule technique is qualitative.
In questionnaire grouping made on different categories. In schedule grouping may or may not exist.

Qualities of a good Questionnaire:
A good questionnaire should be valid, reliable, clear, succinct and interesting. It is important to design the questionnaire based on a conceptual framework, scrutinise each question for relevance and clarity, and think of the analysis you are going to perform at the end of the day.

14. Percentage of coffee habits in two cities 'A' and 'B'.   4)

Attributes	CITY A			CITY B		
	Male	Female	Total	Male	Female	Total
Coffee takers	40	5	45	25	15	40
Non-Coffee takers	20	35	55	30	30	60
Total	60	40	100	55	45	100

15.   4)

Now, $\text{Mode}(Z) = L_1 + \dfrac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$

where $L_1 = 20,\ f_1 = 10,\ f_0 = 6,\ f_2 = 4,\ i = 10$

$$Z = 20 + \left(\frac{10 - 6}{2 \times 10 - 6 - 4} \right) \times 10 = 20 + 4 = 24$$

So, Mode = **24**

OR

4)

Marks	No. of students
1–5	6
6–10	9
11–15	15
16–20	11
21–25	9

Solution. Calculation of Median

Marks	Changed into Exclusive Series	No. of students f	c.f.
1–5	.5– 5.5	6	6
6–10	5.5–10.5	9	15c
11–15	$L_1$10.5–15.5	15f	30
16–20	15.5–20.5	11	41
21–25	20.5–25.5	9	50
		N = 50	

$$M = \text{Size of } \left(\frac{N}{2} \right) \text{th item}$$

$$= \text{Size of } \left(\frac{50}{2} \right) \text{th item}$$

$$= \text{Size of 25th item}$$

It lies in 10.5–15.5 group

$$M = L_1 + \frac{i}{f}(m - c)$$

$$= 10.5 + \frac{5}{15}(25 - 15)$$

$$= 10.5 + 3.33 = 13.33 \text{ Marks.}$$

16. (a) Laspeyre's Method: $P_{01} = \dfrac{\sum P_1 q_0}{\sum P_0 q_0} \times 100 = \dfrac{702}{588} \times 100 = 119.38$ 4)

     Paasche's method: $P_{01} = \dfrac{\sum P_1 q_1}{\sum P_0 q_1} \times 100 = \dfrac{2150}{1760} \times 100 = 122.1$

  (b) How index numbers are useful: 2)

       Index number helps the Government to formulate its price policies.

       They are also used to evaluate the purchasing power of money.

       Index numbers are also being used for forecasting business and economic activities, business cycles etc.

<div align="center">OR</div>

Fishers method :

(a)   3)

     $\sqrt{\dfrac{\sum P_1 q_0}{\sum P_0 q_0} \times \dfrac{\sum P_1 q_1}{\sum P_0 q_1}} \times 100$

     $330/241 \times 405/295 = 1.36 \times 1.37 = \sqrt{1.86} = 1.36$

     $1.36 \times 100 = 136$ Answer

(b)   Difficulties faced in the Construction of Index Numbers   3)

- Difficulties in Choosing a Base Period: ...
- Problem in Commodity Selection: ...
- Problems in Price Compendium: ...
- Difficulty in Choosing a Statistical Approach: ...
- Difficulties Resulting from Changes Over Time: ...
- It is not possible to make a comparison:

17.(a)   3)

X	Rank (x) (R_1)	Y	Rank (y) (R_2)	$R_1 - R_2$ D	D^2
80	1	12	8	−7	49
78	2	13	7	−5	25
75	3.5	14	5	−1.5	2.25
75	3.5	14	5	−1.5	2.25
68	5	14	5	0	0
67	6	16	2	4	16
60	7	15	3	4	16
59	8	17	1	7	49
N = 8		N = 8		$\Sigma D = 0$	$\Sigma D^2 = 159.50$

$$rk = 1 - \frac{6\left[\Sigma D^2 + \frac{1}{12}(m^3 - m) + \frac{1}{12}(m^3 - m)\right]}{N(N^2 - 1)}$$

$$= 1 - \frac{6\left[159.5 + \frac{1}{12}(2^3 - 2) + \frac{1}{12}(3^3 - 3)\right]}{8(8^2 - 1)}$$

$$= 1 - \frac{6(159.5 + 0.5 + 2)}{504}$$

$$= 1 - \frac{6(162)}{504}$$

$$= 1 - \frac{972}{504}$$

$$= 1 - 1.93 = -0.93$$

It shows a high degree of negative correlation between X and Y series.

(b)   3)

Price (X)	$dx = X - A_x$ $A_x = 15$	$dx' = \dfrac{dx}{C_1}$ $C_1 = 5$	dx'^2	Demand (Y)	$dy = Y - A_y$ $A_y = 30$	$dy' = \dfrac{dy}{C_2}$ $C_2 = 5$	dy'^2	$dx'dy'$
5	– 10	– 2	4	40	10	2	4	– 4
10	– 5	– 1	1	35	5	1	1	– 1
15	0	0	0	30	0	0	0	0
20	5	1	1	25	–5	–1	1	– 1
25	10	2	4	20	–10	–2	4	– 4
N = 5		$\Sigma dx' = 0$	$\Sigma dx'^2 = 10$	N = 5		$\Sigma dy' = 0$	$\Sigma dy'^2 = 10$	$\Sigma dx'dy' = -10$

$$ r = \frac{\Sigma dx'dy' - \dfrac{(\Sigma dx') \times (\Sigma dy')}{N}}{\sqrt{\Sigma dx'^2 - \dfrac{(\Sigma dx')^2}{N}} \times \sqrt{\Sigma dy'^2 - \dfrac{(\Sigma dy')^2}{N}}} $$

$$ = \frac{-10 - \dfrac{0}{5}}{\sqrt{10 - \dfrac{0}{5}} \times \sqrt{10 - \dfrac{0}{5}}} $$

$$ = \frac{-10}{\sqrt{10} \times \sqrt{10}} = \frac{-10}{10} = -1 $$

Coefficient of Correlation (r) = – 1.

MICRO ECONOMICS – 40 MARKS

18. c) When MRT is constant   1)
19. (b) MUx/Px = MUy/Py   1)
20. c) 24 units   1)
21. d) Both a & b   1)
22. c) MR curve will be a horizontal straight-line   1)
23. a) Increase in supply   1)
24. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of
Assertion (A)   1)
25. (c) Both (a) and (b)   1)
26. **(b) Both the statements are false.**   **1)**
27. (b) Firm is a price taker and industry is a price maker   1)

28. PPC is concave-shaped because more and more units of one commodity are sacrificed to   3)
gain an additional unit of another commodity. However, if there is unemployment or inefficiency in
resource utilisation, then we can produce at any point inside the PPC.
Increasing MOC justifies concavity of PPC.

Figure 1
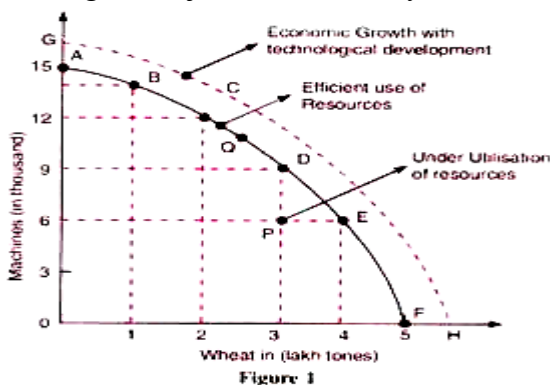
29. An important principle of economic theory is that marginal rate of substitution of X for Y 3) diminishes as more and more of good X is substituted for good Y. In other words, as the consumer has more and more of good X, he is prepared to forego less and less of good Y. The principle of diminishing marginal rate of substitution is illustrated in Fig. 8.4. in Fig. 8.4 (a) when the consumer slides down from A to B on the indifference curve he gives up AY_1 of good Y for the compensating gain of ΔX of good X.

Table 8.2. Indifference Schedule

Combination	Good X	Good Y	MRS_{xy}
A	1	12	4
B	2	8	3
C	3	5	2
D	4	3	1
E	5	2	
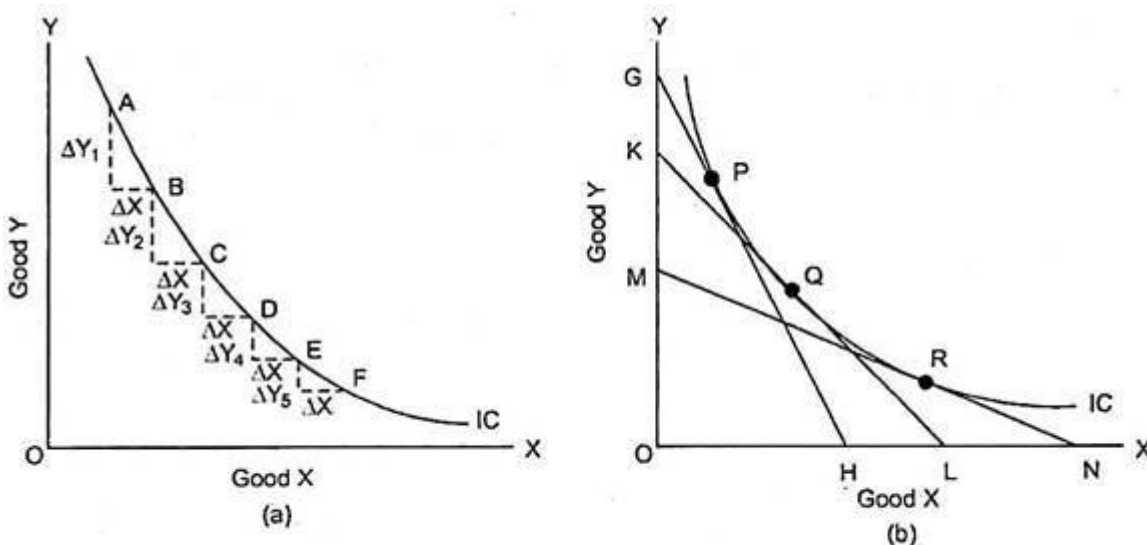
Fig. 8.4. Diminishing Marginal Rate of Substitution

OR

In a single commodity case, consumer equilibrium in utility analysis occurs when the marginal utility of that commodity (measured in terms of money) is equal to its price, meaning the consumer is maximizing satisfaction by purchasing the quantity where the additional utility gained from consuming one more unit is just equal to the cost of that unit; expressed as: MUx = Px.
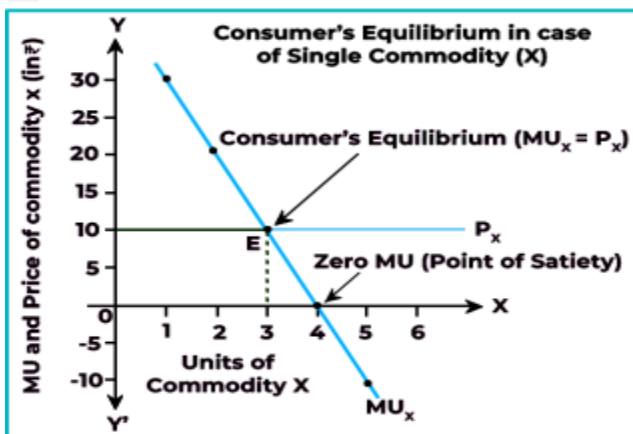
30. The consumer buys 3 units of commodity A and 3 units of commodity B and he spends   4)
 6 rupees on the purchase of both the goods and his Total Utility is maximised.
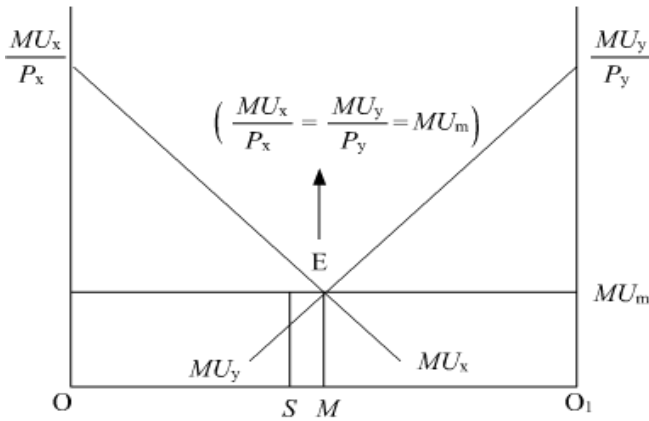
31. (a) False MP after reaching the maximum level starts declining but AP continues to increase   4)
   (b) True MP continues to increase but at a diminishing rate.

OR

AFC: In economics, average fixed cost (AFC) is the fixed costs of production (FC) divided by the quantity (Q) of output produced. As the total number of units of the good produced increases, the average fixed cost decreases because the same amount of fixed costs is being spread over a larger number of units of output.
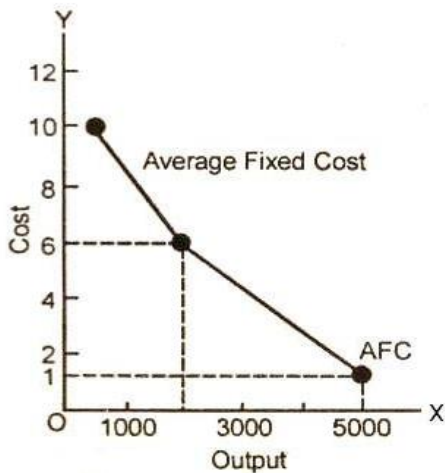
AVC: The second aspect of short-run average costs is an average variable cost. Average variable cost is the total variable cost divided by the number of units produced.

Therefore, AVC is the variable cost per unit of output.

Usually, the AVC falls as the output increases from zero to normal capacity output. Beyond the normal capacity, the AVC rises steeply due to the operation of diminishing returns.
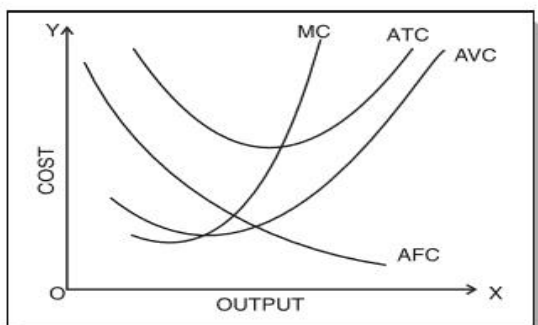
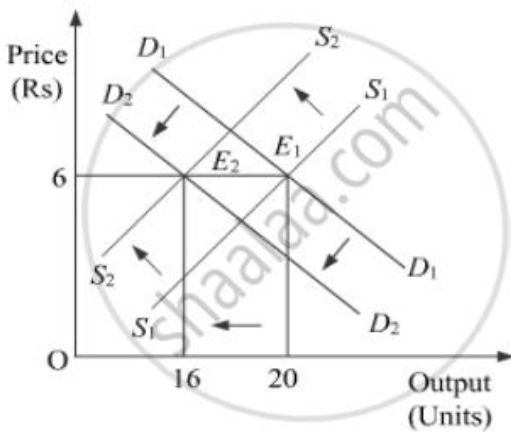Fig. 1 : Short run Average and Marginal Cost Curves

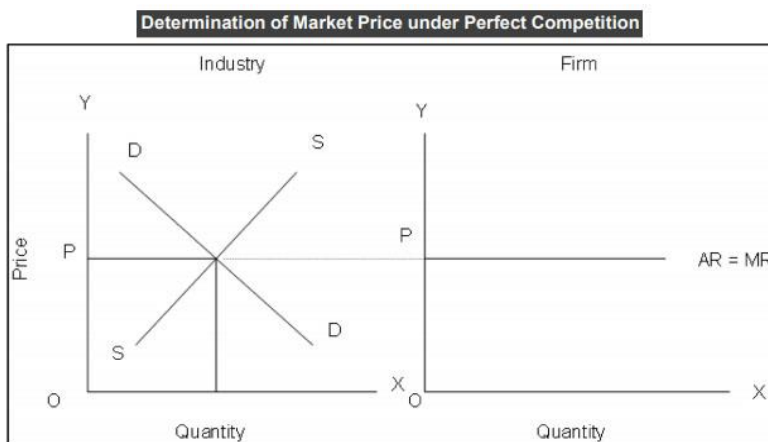32. (a)   2)

Equilibrium price remains the same but equilibrium quantity decreases.

(b) Prices are determined in the industry by the free market forces of demand and supply.   2)
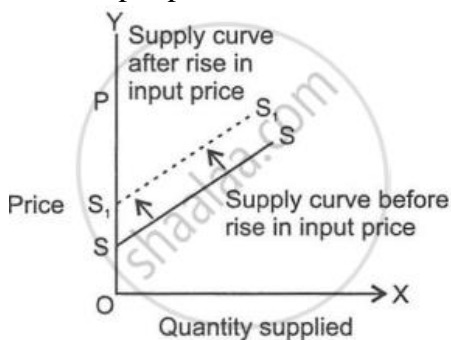

33. (a)

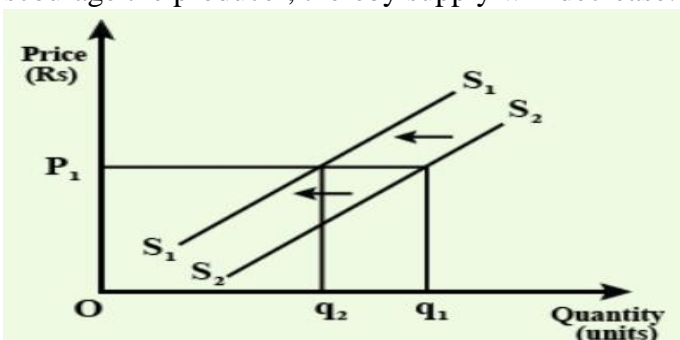When input prices increase the cost of production increases and hence supply declines.   2)

(b) Other things remaining constant, imposition of the tax on a good negatively affects its supply.   2)
This is because tax increases the cost of production of the good. The high cost of production will
Discourage the producer, thereby supply will decrease.

(c)   2)

$$E_s = \dfrac{\dfrac{\text{Change in Quantity Supplied}}{\text{Average Quantity Supplied}}}{\dfrac{\text{Change in Price}}{\text{Average Price}}}$$

$$= \dfrac{\dfrac{\Delta Q}{(Q1+Q2)/2}}{\dfrac{\Delta P}{(P1+P2)/2}}$$

$$= \dfrac{\Delta Q}{\Delta P} \times \dfrac{P1+P2}{Q1+Q2}$$

$$= \left(\dfrac{(Q2-Q1)}{(P2-P1)}\right) \times \left(\dfrac{P1+P2}{Q1+Q2}\right)$$

Es = 18.7 = Relatively elastic supply i. e Greater than one.

OR

(a) A "price ceiling" is a government-imposed maximum price that sellers are allowed to charge   4)
for a good or service, essentially setting a limit on how high a price can go; when a price ceiling is set
below the equilibrium market price, it can lead to "black marketing," which is the illegal trading of goods
and services at prices higher than the set ceiling, often occurring due to shortages created by the price
control measure.
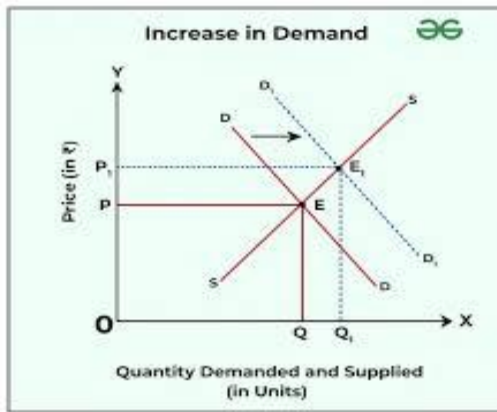
Black market emergence:
Since the legal market cannot fulfill the demand at the fixed price, individuals may resort to buying and
selling goods on the "black market" where sellers can charge higher prices than the legal limit, exploiting
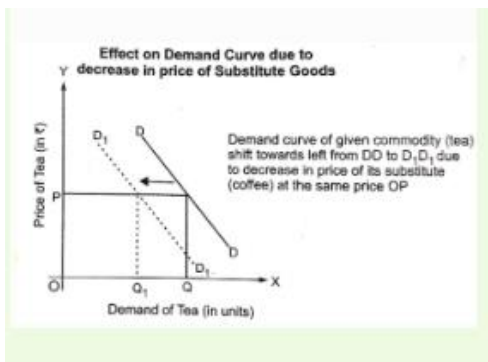the high demand and limited supply.

Price Ceiling
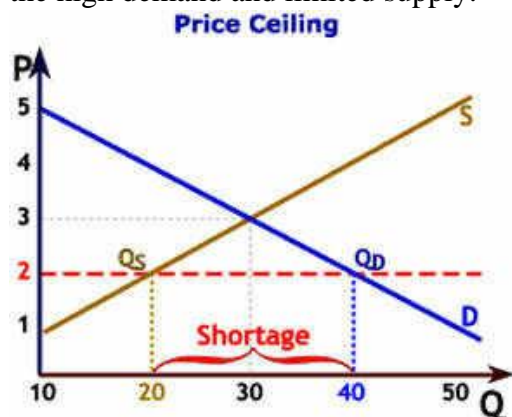
b) (i) Increase in the income of the consumer : When the income of the consumer increases,   1)
demand of the consumer increases and there will be increase in the equilibrium price and equilibrium
quantity.

(ii) Decrease in the price of the substitute goods: When there is a decrease in the price of the   1)
substitute good there will decrease in the demand of the good and this will lead to decrease in the
equilibrium price and the equilibrium quantity.

Increase in income of consumer

Increase in Demand

Quantity Demanded and Supplied (in Units)

Decrease in price of substitute good.

Effect on Demand Curve due to decrease in price of Substitute Goods

Demand curve of given commodity (tea) shift towards left from DD to D_1D_1 due to decrease in price of its substitute (coffee) at the same price OP

Demand of Tea (in units)

34. (i) **Increase in Price of Complementary Goods:** When there is an increase in the price of   3) complementary goods (say, butter), the demand for the given commodity (say, bread) will decrease from OQ to OQ1, with the same price OP. It results in a leftward shift in the demand curve of the given commodity (bread) from DD to D1D1.

Effect on Demand Curve due to Increase in Price of Complementary Goods

Demand of Bread (in Units)
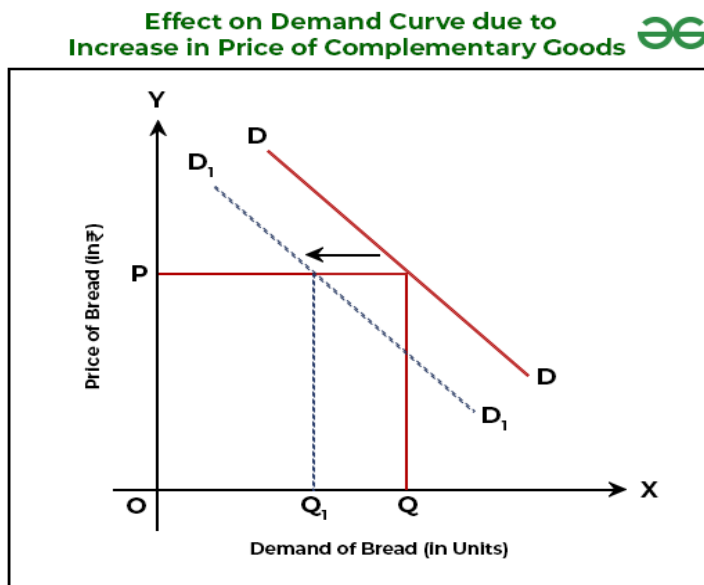
(ii) The Law of Demand is based on the following assumption. There should not be any change in the size and composition of the population. Because a change in population will bring about a change in demand even if the price remains the same. The income of consumer should remain constant. 3)

The assumptions on which the Law of Demand is based are as follows:
1. The price of substitute goods does not change.
2. The price of complementary goods also remains constant.
3. The income of the consumer does not change.
4. Tastes and preferences of the consumers remain the same.
5. People do not expect the future price of the commodity to change.
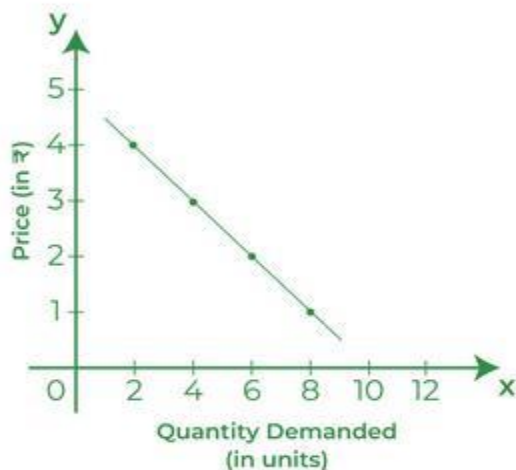
Exceptions to Law of Demand
1. Giffen Goods: The special kind of inferior goods on which the consumers spend a big part of their income are known as Giffen Goods. The demand for these goods increases with an increase in price and falls with a decrease in price. This phenomenon was initially observed by **Sir Robert Giffen** and is popularly known as **Giffen's Paradox**.
For example, rice is an inferior good and wheat is a normal good. Hence, if the price of rice falls, the consumer will spend less on rice and will start buying more wheat.

2.. Status Symbol or Goods of Ostentation: Another exception to the law of demand is the goods that are used as status symbols by the people.
For example, people buy goods like antique paintings because of the status symbol they want to maintain. They demand antique paintings only because their price is high. It means that if the price of antique paintings reduces, then the consumers will no longer see it as a status symbol and will reduce its demand.

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