CBSEClass12 Economics

NCERT Solutions

Chapter-02 (Microeconomics)

Theory ofConsumerBehaviour

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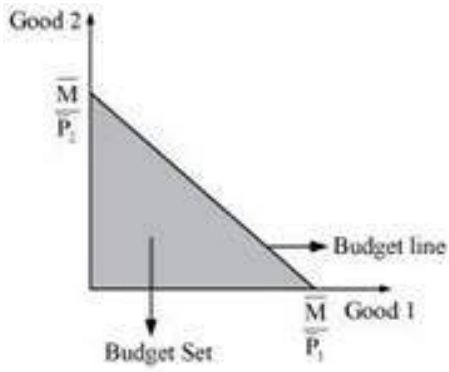
1. Whatdoyoumeanbythebudgetsetofaconsumer?

Ans: Thecollectionofallthebundlesthattheconsumercanbuywiththeirincomeatthe prevailingmarketpricesiscalledbudgetsetofaconsumer.



Quantity of good 1 is measured along the horizontal axis and Quantity of good 2 is measured along the vertical axis. The budget set consists of all points on or below the straight line ie.the budget line.

2. What is budgetline?

Ans: Abudgetlinerepresentsthedifferentcombinationsoftwogoodsthatareaffordable and are available to a consumer; while being aware of his/her income-level and market prices of both thegoods.

Let x_1 be the amount ofgood1.

x_2 be the amount ofgood2. p_1

be the price of good1.

p_2 be the price of good2.

p_1x_1 = Total money spent on good 1.

p_2x_2 = Total money spent on good 2.

Then, the budget line will be:

$p_1x_1 + p_2x_2 = M$

Alltheconsumptionbundlesonthebudgetlinecosttheconsumerexactlytheequivalentof his/herincome.

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3. Explainwhythebudgetlineisdownwardsloping.

Ans: The budget line is downward sloping because a consumer can increase the consumption of good 1 only by decreasing the consumption of good 2. The consumer has limited income which can be spend to buy good 1 and good 2.

The slope of the budgetlineis $\frac{-P_1}{P_2} = \frac{\Delta x_2}{\Delta x_1}$, which implies the rate of exchange or the rate at which good 2 can be substituted for good1.

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4. Aconsumerwantstoconsumetwogoods.ThepricesofthetwogoodsareRs.4and Rs.5respectively.Theconsumer'sincomeisRs20.

(i) Writedowntheequationofthebudgetline.

(ii) Howmuchofgood1cantheconsumerconsumeifshespendsherentireincomeon thatgood?

(iii) Howmuchofgood2cansheconsumeifshespendsherentireincomeonthatgood?

(iv) Whatistheslopeofthebudgetline?

Ans:

(i) P_1 = Rs4

P_2 = Rs 5

M = Rs 20

Equation of the budget line $P_1 \times x_1 + P_2 \times x_2 = M$

$$4x_1 + 5x_2 = 20$$

(ii) If Rs 20 is entirely spent on good 1, then the amount of good 2 demanded will be zero i.e., $x_2 = 0$ as the consumer has no income left to spend on good 2.

$$4x_1 + 5(0) = 20$$

$$4x_1 = 20$$

$$x_1 = \frac{20}{4}$$

$$x_1 = 5$$

Amount of good 1 consumed = 5 units

(iii) If Rs 20 is entirely spent on good 2, then $x_1 = 0$, as the consumer has no income left to spend on good1.

$$4(0) + 5x_2 = 20$$

$$5x_2 = 20$$

$$x_2 = \frac{20}{5}$$

$$x_2 = 4$$

Amount of good 2 consumed = 4 units

(iv) Slope of the budget line $= \frac{-P_1}{P_2}$

$$= \frac{\text{-Price of good 1}}{\text{Price of good 2}} = -\frac{4}{5}$$

= -0.8

Questions 5, 6 and 7 are related to question 4.

5. Howdoesthebudgetlinechangeiftheconsumer'sincomeincreasestoRs.40butthe prices remainunchanged?

Ans: M_2 = Rs.40

P_1 = Rs. 4

P_2 = Rs. 5

Initial equation of the budget line:

$$4x_1 + 5x_2 = 20$$

New equation of the budget line:

$$4x_1 + 5x_2 = 40$$

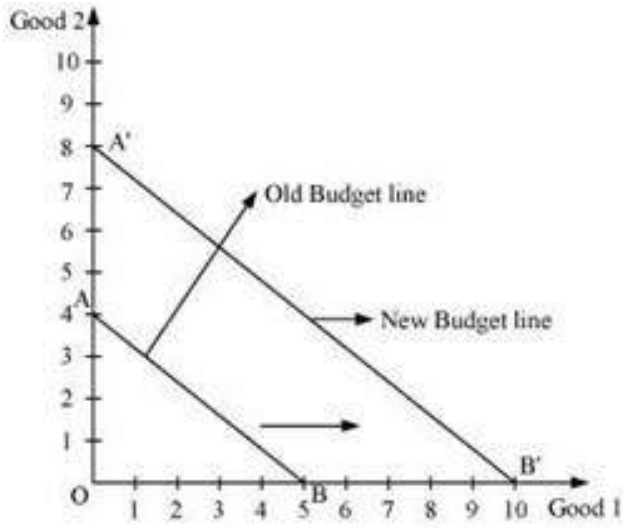
AsMhasincreased,theconsumercannowpurchasemoreofboththegoodsandthe increase in the income causes a parallel outward shift ofbudget linefrom AB to A'B'.

Horizontalinterceptwillbe=**M**/**P_1=40**/**4**=10

Vertical interceptwillbe= $\frac{M}{P_2} = \frac{40}{5}$ =8

The slope of the new budget line will be the same as that of the old budget line.

$$\frac{-P_1}{P_2} = \frac{4}{5}$$



6. Howdoesthebudgetlinechangeifthepriceofgood2decreasesbyarupeebutthe priceofgood1andtheconsumer'sincomeremainunchanged?

Ans: P_1 = Rs.4

P_2 = Rs. 5

P_2^1 = Rs. 4

M = Rs. 20

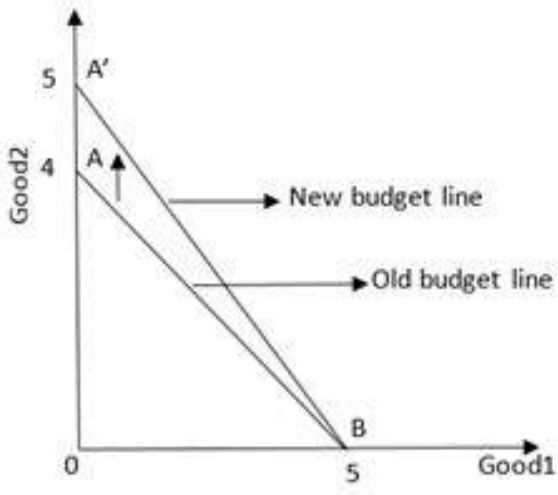
Since the income and the price of good 1 remain unchanged, the decrease in the price of good 2

willincreasetheverticalinterceptofthebudgetline.Thenewbudgetlinewillalsopivot outwards around the same horizontalintercept.

Horizontalinterceptwillbe=**M/P_1=20/4=5**

Verticalinterceptwillbe=**M/P_2=20/4=5**

Slope= $\frac{-P_1}{P_2} = \frac{4}{4}$ =-1



Theslopeofthenewbudgetlinewillbemoreandthenewbudgetlinewillbesteeperthan the originalone.

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7. Whathappenstothebudgetsetifboththepricesaswellastheincomedouble?

Ans: If the prices and the income are doubled, then the budget line will remain unchanged.

M_1 =Rs.20, M_2 =Rs.40

P_1 =Rs.4, P_1 =Rs.8

P_2 =Rs5, P_2 =Rs.10

Horizontalintercept= $\frac{M_2}{P_1} = \frac{40}{8}$ =5

Vertical intercept = $\frac{M_2}{P_2} = \frac{40}{10}$ =4

Slope= $\frac{-P_1}{P_2} = \frac{-8}{10}$ =-0.8

Hence, the vertical intercept, the horizontal intercept and the slope of the budget line will remainthesame.Thenewbudgetlinewillbethesameastheoldbudgetlinebutassociated withhigherincomeandhigherpricesofboththegoods.

8. Supposeaconsumercanaffordtobuy6unitsofgood1and8unitsofgood2ifshe spendsherentireincome.ThepricesofthetwogoodsareRs6andRs8respectively. Howmuchistheconsumer'sincome?

Ans: P_1 = Rs.6

P_2 = Rs. 8

x_1 = 6

x_2 = 8

Budget line =M= $P_1x_1 + P_2x_2$

M= $6\times6+8\times8$

M = 36 + 64

M = 100

Thus, the consumer's income is Rs 100.

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9. Supposeaconsumerwantstoconsumetwogoodswhichareavailableonlyininteger units.Thetwogoodsareequallypricedat Rs10andtheconsumer'sincomeisRs40.

(i) Writedownallthebundlesthatareavailabletotheconsumer.

(ii) Amongthebundlesthatareavailabletotheconsumer,identifythosewhichcosther exactly Rs40.

Ans:

(i) P_1 = Rs.10

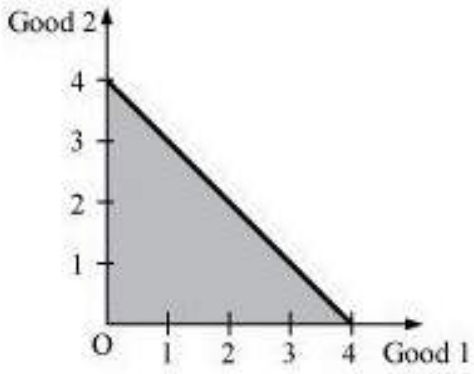
P_2 = Rs. 10

M = Rs. 40

Budget set = $P_1x_1 + P_2x_2 \leq M$

$10x_1 + 10x_2 \leq 40$

The bundles that are available to the consumer should cost less than or equal to Rs 40.



Horizontalintercept= $\frac{M_2}{P_1} = \frac{40}{10}$ =4

Vertical intercept = $\frac{M_2}{P_2} = \frac{40}{10}$ =4

Slope= $\frac{-P_1}{P_2} = \frac{-10}{10}$ =-1

Thebundlesintheshadedregion (ΔAOB) areallavailabletotheconsumer,includingthe bundles lying on the lineAB.

(0, 0) (0, 1) (0, 2) (0, 3) (0, 4)

(1, 0) (1, 1) (1, 2) (1, 3) (2, 0)

(2, 1) (2, 2) (3, 0) (3, 1) (4, 0)

(ii) Thecoordinatesthatlieonthe lineABcostexactlythesameastheincomeofthe consumer. The bundles are asfollows:

(0,4) (1,3) (2,2) (3,1) (4,0)

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10. Whatdoyoumeanby'monotonicpreferences'?

Ans: Monotonic preferences meansthattheconsumerprefersaparticularbundleovertheotherbundleifthe formerconsistsofatleastmoreofonegoodandnolessoftheothergood. A rational consumer will always prefer more of a commodity as it offers him ahigher level of satisfaction.

Example:IfbundleA(4,6)andbundleB(4,2)areavailabletotheconsumer,thenhe/shewill preferbundleAoverbundleBasbundleAconsistsofmoreunitsofgood2thanbundleB.

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11. Ifaconsumerhasmonotonicpreferences,canshebeindifferentbetweenthe bundles(10,8)and(8,6)?

Ans: According to monotonic preferences a consumer cannot be indifferent towards these two bundles as bundle 1 consists of moreofbothgoodsascomparedtobundle2. A consumer willpreferbundle1overbundle2asit contains10unitsofgood1and8unitsofgood2ascomparedto8unitsand6unitsofgood1 and good 2 respectively in bundle2.

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12. Supposeaconsumer'spreferencesaremonotonic.Whatcanyousayabouther preferencerankingoverthebundles(10,10),(10,9)and(9,9)?

Ans: Ifaconsumerhasmonotonicpreferences,then his/herpreferenceswillrankedasfollows:

First preference: (10,10)

Second preference: (10,9)

Third preference: (9,9)

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13. Supposeyourfriendisindifferenttothebundles(5,6)and(6,6).Arethe preferencesofyourfriendmonotonic?

Ans: Itisgiventhatmyfriendisindifferenttowardsthebundles(5,6)and(6,6).Thisimplies thathis/herpreferencesarenotmonotonic.Ifhe/sheisindifferenttowardsboththebundles, then it means that he/she derives the same level of satisfaction and assigns them the same rank.However,thesecondbundleconsistsofmoreofboththegoods.Thus,accordingtothe

monotonicassumption,he/shemustpreferthesecondbundleoverthefirst.

14. Supposethereareturconsumersinthemarketforagoodandtheirdemand functions areasfollows: $d_1(p) = 20 - p$ **foranypricelessthanorequalto20,and** $d_1(p) = 0$ **atanypricegreaterthan20.** $d_2(p) = 30 - 2p$ **foranypricelessthanorequalto15and** $d_1(p) = 0$ **atanypricegreaterthan15.Findoutthemarketdemand function.**

Ans: $d_1(p) = 20 - p \begin{cases} p \le 20 \\ p > 20 \end{cases}$

$d_2(p) = 30 - 2p \begin{cases} p \le 15 \\ p > 15 \end{cases}$

For price less than Rs15 $(p \le 15)$

Marketdemandforagood= $d_1(p) + d_2(p)$

= 20 – p + 30 – 2p

= 50 – 3p

For price more than Rs 15 but less thanRs 20 $(15 < p \le 20)$ Market

demand = $d_1(p) + d_2(p)$

=20–p+0 $(\because \text{for } p>15,\ d_2(p) = 0)$

= 20 – p

For price more than 20 (p>20)

Market demand = $d_1(p) + d_2(p)$

= 0 +0 $(\because \text{for } p>10,\ d_1(p) = 0,\ d_2(p) = 0)$

= 0

Thus, market demand

= 50 – 3pif $p \leq 15$

= 20 – p if $15 < p \leq 20$

= if p>20

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15. Supposethereare20consumersforagoodandtheyhaveidenticaldemand functions:

d(p)=10–3pforanypricelessthanorequalto $\frac{10}{3}$ **and** $d_1(p)=0$ **atanypricegreater than** $\frac{10}{3}$ **.Whatisthemarketdemandfunction?**

Ans: d(p) = 10 – 3p if $p \le \frac{10}{3}$

$d_1(p)=0$ if $p > \frac{10}{3}$

Market demand = Summation of demand of all the consumers in the market

For $price \le \frac{10}{3}$

Marketdemand= $20\sum d(p)$ (Sinceconsumershaveidenticaldemandcurve)

= $20\times(10-3p)$

= 200 – 60p

For $price > \frac{10}{3}$

Market demand = $20\times d_1(p)$

= 20×0

= 0

Market demand function $= 200 - 60p \begin{cases} if \ \ p \le \frac{10}{3} \\ if \ \ p > \frac{10}{3} \end{cases}$

= 0

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16. Consideramarketwheretherearejusttwoconsumersandsupposetheirdemands forthegoodaregivenasfollows:

P	d_1	d_2
1	9	24
2	8	20
3	7	18
4	6	16
5	5	14
6	4	12

Calculatethemarketdemandforthegood. Ans:

P	d_1	d_2	Market demand = D= $d_1 + d_2$
1	9	24	9 + 24 = 33
2	8	20	8 + 20 = 28
3	7	18	7 + 18 = 25
4	6	16	6 + 16 = 22
5	5	14	5 + 14 = 19
6	4	12	4 + 12 = 16

17. Whatdoyoumeanbyanormalgood?

Ans: A good whose demand increases with the increase in the income of the consumers and demand decreases with the decrease in income of the consumers is known as normal good.

There is a direct relationship between income and demand.

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18. Whatdoyoumeanbyan‘inferiorgood’?Givesomeexamples.

Ans: Inferiorgood:Thosegoodsthatshareaninverserelationshipwiththeirpricesandwith theincomeofaconsumerarecalledinferiorgoods.Thatis,

Ifthepriceofagood (P_X) increases,thenthedemandforthegood (D_X) decreases. As the income of the consumer increases the demand for inferior good decreases.

For Example food items like coarse cereals.

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19. Whatdoyoumeanbysubstitutes?Giveexamplesoftwogoodswhicharesubstitutes of eachother.

Ans: Thosegoodsthatcanbeconsumedinplaceofothergoodsarecalledsubstitutegoods. Example:Teaandcoffeearegoodsthatcanbesubstitutedforeachother.Ifthepriceoftea increases, then the demand for tea will decrease and people will substitute coffee for tea, which will increase the demand forcoffee.

The demand for a good move in the same direction as the price of its substitutes.

Price oftea (P_T) increases $\rightarrow$ Demand fortea (D_T) decreases $\rightarrow$ Demandforcoffee (D_C) increases.

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20. Whatdoyoumeanbycomplements?Giveexamplesoftwogoodswhichare complements of eachother.

Ans: Thosegoodsthatareconsumedtogetherarecalledcomplementarygoods.Example:Tea and sugar. If the price of sugar increases, then it will lead to a decrease in the demand for tea.Ifthepriceofteaincreases,thenitwillreducethedemandforsugar.

The demand for a good move in the opposite direction of the price of its complementary goods. That is,

IftthePriceoftea (P_T) increases,thenthedemandforsugar (D_S) decreases.

IftthePriceofsugar (P_S) increases,thenthedemandfortea (D_T) decreases.

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21. Explainpriceelasticityofdemand.

Ans: Priceelasticityofdemandisthemeasureofthedegreeofresponsivenessofthedemand for a good to the changes in its price. It is defined as the percentage change in the demand foragooddividedbythepercentagechangeinitsprice.

$$e_d = \frac{\text{percentage change in the demand for a good}}{\text{percentage change in the price of a good}}$$

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

Where,

$\Delta Q = Q_2 - Q_1$, change in demand

$\Delta P = P_2 - P_1$, change in price

P = initial price

Q = initial quantity

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22. Considerthedemandforagood.AtpriceRs4,thedemandforthegoodis25units. Supposepriceofthegoodincreasestors5,andasaresult,thedemandforthegood fallsto20units.Calculatethepriceelasticity.

Ans: $P_1 = 4$, $Q_1 = 25$

$P_2 = 5$, $Q_2 = 20$

$\Delta P = P_2 - P_1 = 5 - 4 = 1$

$\Delta Q = Q_2 - Q_1 = 20 - 25 = -5$

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

$= \frac{-5}{1} \times \frac{4}{25}$

$= \frac{-4}{5}$

e_d = -0.8

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23. Considerthedemandcurve D(p)=10–3p. Whatistheelasticityatprice $\frac{5}{3}$?

Ans: D(p)=10–3p

b= $\Delta Q / \Delta P$=3

p=5/3 or D (5/3)= 10 -3x5/3

Q = 10-5 =5

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

= -3 x $(5/3)/5$

e_d = -1

i.e., the elasticity of demand at pricep= $\frac{5}{3}$ is unitaryelastic.

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24. Supposethepriceelasticityofdemandforagoodis–0.2.Ifthereisa5%increasein thepriceofthegood,bywhatpercentagewillthedemandforthegoodgodown?

Ans: e_d = -0.2 [Note that e_d = -2. Hence we need not prefix ed to (-2)]

Percentage change in price =5%

$$e_d = \frac{\text{percentage change in demand}}{\text{percentage change in price}}$$

$$-0.2 = \frac{\text{percentage change in demand}}{5}$$

Percentage change in quantity demanded= -1%(decrease)

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25. Supposethepriceelasticityofdemandforagoodis–0.2.Howwilltheexpenditure onthegoodbeaffectedifthereisa10%increaseinthepriceofthegood?

Ans: Since the price elasticity of demand$E_p$is-0.2,thatislessthanoneorinelasticdemand,thenanincreaseinpriceof goodwillresultanincreaseintheexpenditure.Becauseincaseofinelasticdemand,price and expenditure are positivelyrelated.

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26. Suppose there was a 4 % decrease in the price of a good, and as a result, the expenditureonthegoodincreasedby2%.Whatcanyousayabouttheelasticityof demand?

Ans: Decrease in price= 4%

Rise in expenditure= 2%

$$\Delta E = \Delta P[q + (1 + e_d)]$$

Sincethepricehasdecreased,theexpenditureonthegoodwillincrease.Thisimpliesthat thepercentageofchangeindemandhasincreasedmorethanthepercentagedecreasein price. There is an indirect relation between the price of the good and the expenditure on the good.

Thus, elasticity = $\frac{\%\ change\ in\ demand}{\%\ change\ in\ price}$