**Consumer’s Equilibrium (Cardinal Utility)**

Q 1. A person’s total utility (TU) schedule is given below. Derive marginal utility (MU).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Units | 0 | 1 | 2 | 3 | 4 | 5 |
| TU  | 0 | 10 | 25 | 38 | 48 | 55 |

Q 2. A person’s MU schedule is given below. Derive TU:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Units Consumed | 1 | 2 | 3 | 4 | 5 | 6 |
| MU  | 9 | 6 | 4 | 2 | 0 | -2 |

Q 3. Calculate the missing figures:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Units  | 1 | 2 | 3 | 4 | 5 |
| TU (in utils) | 16 | - | - | - | 40 |
| MU (in utils) | - | 12 | 8 | 6 | - |

Q 4. Suppose the price of a commodity ‘x’ is given as ₹ 8 and the MU (in terms of money) for 4 units is given as:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Units  | 1 | 2 | 3 | 4 |
| MUx (₹) | 12 | 10 | 8 | 6 |

How many units should a consumer purchase so that his satisfaction is maximum?

Q 5. Given below is the utility schedule of a consumer for commodity X. The price of the commodity is ₹ 6 per unit. How many units should the consumer purchase to maximize his satisfaction? (Assume that utility is expressed in utils and 1 util = ₹ 1). Give reasons for your answer.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Consumption units | 1 | 2 | 3 | 4 | 5 | 6 |
| Total utility (TU) | 10 | 18 | 25 | 31 | 34 | 34 |
| Marginal utility (MU) | 10 | 8 | 7 | 6 | 3 | 0 |

Q 6. Following is the utility schedule of a person:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Units of x Consumed | 1 | 2 | 3 | 4 | 5 |
| MU (in utils) | 50 | 40 | 30 | 20 | 10 |

Suppose that the commodity is sold for ₹ 4 and MU of one rupee is 5 utils. How many units of the commodity will the person purchase to maximize his satisfaction?

Q 7. Suppose that an ice-cream is sold for ₹ 30. Laxmi, who loves ice-cream, has already eaten 3. Her marginal utility from eating 3rd ice-cream is 90 utils. If MU of ₹ 1 is 3 utils, should she eat more ice-creams or should she stop?

Q 8. The marginal utility schedule for goods X and Y are given below. Both the goods are priced at ₹ 1 each and income of Rakesh (an individual) is assumed to be ₹ 8. Determine, how many units of both the commodities should be purchased by Rakesh to maximize his total utility?

|  |  |  |
| --- | --- | --- |
| Quantity (units) | Marginal Utility of X (MUX)(Utils) | Marginal Utility of Y (MUy)(Utils) |
| 12345678 | 1110987654 | 19171513121086 |

Q 9. A consumer consumes only two goods X and Y whose prices are ₹ 5 and ₹ 4 per unit respectively. If MUY = 16 at the point of consumer’s equilibrium, calculate MUX.

Q 10. A consumer consumes only two goods X and Y. the consumer chooses a combination of the two goods with marginal utility of X equal to 30 and that of Y equal to 20. If price of good X is ₹ 6 per unit, then what will be price of good Y at the point of consumer’s equilibrium?

Q 11. A consumer consumes only two goods X and Y whose prices are ₹ 5 and ₹ 6 per unit respectively. If the consumer chooses a combination of the two goods with marginal utility of X equal to 35 and that of Y equal to 30, is the consumer in equilibrium? Give reasons. What will a rational consumer do in this situation? Use utility analysis.

Q 12. How many ice-creams will a consumer have, if ice-cream is available free of cost”?

Q 13. “Law of diminishing marginal utility will operate even if consumption takes place in intervals”. Defend or refute.

Q 14. “TU remains the same, whether MU is positive or negative”. Defend or refute.

Q 15. What changes will take place in TU, when:

1. MU curve remains above the X-axis;
2. MU curve touches the X-axis;
3. MU curve lies below the X-axis.

Q 16. A consumer consumes only two goods X and Y and is in equilibrium. Price of X falls. Explain the reaction of consumer through the Utility Analysis.

OR

Suppose a consumer spends his entire income on two goods: X and Y. if he has attained the point of equilibrium through utility analysis, then he will not change his allocation of expenditure on the two goods X and Y, even if price of good X falls. Defend or Refute.

Q 17. A consumer consumes only two goods X and Y whose prices are ₹ 4 and ₹ 5 per unit respectively. If the consumer chooses a combination of the two goods with marginal utility of X equal to 5 and that of Y equal to 4, is the consumer in equilibrium? Give reasons. What will a rational consumer do in this situation?

Q 18. At the point of satiety, marginal utility is \_\_\_\_\_\_\_\_\_\_.

Q 19. The utility derived from the first unit of a commodity is known as \_\_\_\_\_\_\_\_\_.

Q 20. As long as MU is positive, TU \_\_\_\_\_\_\_\_ with an increase in consumption of a commodity.

Q 21. MUX of X is 50 and MUY of Y is 40. It is the price of Y is ₹ 8, then price of X at equilibrium will be \_\_\_\_\_\_\_\_\_\_.

Q 22. Any consumption beyond the point of satiety leads to \_\_\_\_\_\_\_\_\_\_.

Q 23. Total utility is \_\_\_\_\_\_\_\_ when marginal utility is zero.

Q 24. If consumption of an additional unit of a commodity causes no change in TU, then the resultant MU is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Q 25. Total Utility is \_\_\_\_\_\_\_\_\_\_\_\_ at the point of satiety.

Q 26. The total utility derived by Kartik by eating 12 oranges is 400 utils. Marginal Utility of the 13th orange is 20 utils. The total utility for 13 oranges will be \_\_\_\_\_\_\_\_\_\_\_\_\_ utils.

Q 27. The necessary condition under utility approach to attain consumer’s equilibrium in case of 2 commodities is:

1. $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$
2. MRX = $\frac{P\_{X}}{P\_{Y}}$
3. MUX = PX
4. None of these

Q 28. When we add up utility derived from consumption of all the units of the commodities, we get:

1. Total Utility
2. Initial Utility
3. Marginal Utility
4. None of these

Q 29. Marginal Utility (MU) in terms of money is equal to:

1. $\frac{Marginal Utility in utils}{Marginal Utility of one rupee}$
2. $\frac{Marginal Utility of one rupee}{Marginal Utility in utils}$
3. $\frac{Marginal Utility in utils}{Price of the Commodity}$
4. None of these

Q 30. According to the Law of Diminishing Marginal Utility, satisfaction obtained from consumption of each successive unit:

1. Increases
2. Decreases
3. Remains same
4. Either increases or decreases

Q 31. If $\frac{MU\_{X}}{P\_{X}}$ > $\frac{MU\_{Y}}{P\_{Y}}$, then to reach the equilibrium position, consumer should:

1. Stop buying any commodity
2. Buy both the commodities in equal quantity
3. Buy more of X and less of Y
4. Buy more of Y and less of X

Q 32. If the consumption of an additional unit of a commodity causes no change in TU, then the resultant MU is:

1. Zero
2. Positive
3. Negative
4. Constant

Q 33. Total Utility is \_\_\_\_\_\_\_\_\_\_\_\_ at the point of satiety:

1. Minimum
2. Maximum
3. Zero
4. None of these

Q 34. Marginal Utility (MU) of nth unit is calculated as:

1. MUn = TUn – TUn+1
2. MUn = TUn + TUn+1
3. MUn = TUn + TUn-1
4. MUn = TUn – TUn-1

Q 35. In case of single commodity, consumer’s equilibrium is achieved when:

1. MUX > PX
2. MUX < PX
3. MUX $\ne $ PX
4. MUX = PX

Q 36. How is TU derived from MU?

1. TU = ∑MU
2. TU = U1 + U2 + U3 ------------- + UN
3. Both (a) and (b)
4. None of these

Q 37. What happens to MU when TU is maximum?

1. MU is negative
2. MU is zero
3. MU is decreasing
4. MU is increasing

Q 38. In case of cardinal utility approach, utility is measured in:

1. Rupees
2. Ranks
3. Utils
4. None of these

Q 39. “Cardinality” means utility can be:

1. Measured
2. Ranked
3. Not measured
4. None of these

Q 40. Which Law states that: “When a consumer consumes more and more units of a product, the utility derived from each additional unit decreases”?

1. Law of Equi-Marginal Utility
2. Law of Ordinal Utility
3. Law of Cardinal Utility
4. Law of Diminishing Marginal Utility

Q 41. The total utility derived by Shyam by eating 6 apples is 300 utils. Marginal Utility of the 7th apple is 30 utils. The total utility for 7 apples will be \_\_\_\_\_\_\_ utils.

1. 330
2. 270
3. 300
4. 30

Q 42. The assumption of “Constant marginal utility of money” means that importance of money to consumer is:

1. Increasing
2. Decreasing
3. Same
4. None of these

Q 43. When Economists speak of the utility of a certain product, they are referring to:

1. Demand for the product
2. Usefulness of the product in consumption
3. Satisfaction gained from consuming such product
4. Rate at which consumers are willing to exchange one good for another

Q 44. Utility:

1. Differs from person to person
2. Differs from time to time
3. Differs from product to product
4. All of these

Q 45. A consumer in consumption of two commodities A and B is at equilibrium. The prices of A and B are ₹ 10 & ₹ 20 respectively & the marginal utility of product B is 50. What will be the marginal utility of product A?

1. 100
2. 25
3. 250
4. 4

Q 46. The Law of Diminishing Marginal Utility will not hold good if income of the consumer:

1. Increases
2. Decreases
3. Remains constant
4. Either (a) or (b)

Q 47. Marginal Utility:

1. Is always positive
2. Is always negative
3. Can be positive or negative but not zero
4. Can be positive or negative or zero

Q 48. Mollie derives total utility of 10 utils after having 4 mangoes and total utility on consuming 5 mangoes is 9. What is her marginal utility for the 5th mango?

1. +1 util
2. 0 util
3. -1 util
4. 9 utils

Q 49. After reaching the point of satiety, consumption of additional units of the commodity cause:

1. TU falls and MU increases
2. Both TU and MU increases
3. TU falls and MU falls and becomes negative
4. TU becomes negative and MU falls

Q 50. According to one of the assumptions of Law of Diminishing Marginal Utility, there should be \_\_\_\_\_\_\_\_\_\_ between the consumption of one unit and another unit.

1. Equal time gap
2. No time gap
3. Long time gap
4. Any of these

Q 51. MUX of X is 40 and MUY of Y is 30. If the price of Y is ₹ 9, then price of X at equilibrium will be \_\_\_\_\_\_\_\_\_\_\_.

1. ₹ 9
2. ₹ 30
3. ₹ 15
4. ₹ 12

Q 52. The consumer is in equilibrium when Marginal Utility from a Commodity equals:

1. Demand for that commodity
2. Supply of that commodity
3. Price of the commodity
4. All of these

Q 53. Marginal utility is:

1. The utility from first unit of a commodity consumed
2. The utility from the last unit consumed
3. Total utility divided by number of units consumed
4. Always positive

Q 54. Total Utility is \_\_\_\_\_\_\_\_\_\_\_\_\_.

1. The sum of marginal utilities
2. Utility from first unit $×$ Number of units consumed
3. Always increasing
4. Utility from last unit $×$ Number of units consumed

Q 55. Which of the following can be referred to as ‘point of satiety’?

1. Marginal Utility is negative
2. Marginal Utility is zero
3. Total Utility is rising
4. Total Utility is falling

Q 56. At the point of Satiety:

1. MU is Negative
2. MU is zero
3. MU is Rising
4. None of these

Q 57. If MUY = 20; MUX = 60; Price of Y = ₹ 4, then what will be the Price of X at Equilibrium:

1. ₹ 14
2. ₹ 3
3. ₹ 12
4. ₹ 4

Q 58. When marginal utility is zero, total utility is:

1. Zero
2. Minimum
3. Maximum
4. Negative

Q 59. Which is the First Law of Gosen?

1. Law of Equi-marginal Utility
2. Law of Diminishing Marginal Utility
3. Law of Supply
4. Law of Demand

Q 60. Which of the following is a characteristic of utility?

1. Utility is Subjective
2. Utility is a relative concept
3. Utility is a Psychological phenomenon
4. All of these

Q 61. Which of the following statement is not true?

1. As long as MU is positive, TU increases
2. TU is zero when MU is zero
3. TU starts decreasing when MU is negative
4. After the point of satiety, MU becomes negative

**Answer**

1.

|  |  |  |
| --- | --- | --- |
| Units | TU | MUMUn = TUn – TUn-1 |
| 012345 | 01025384855 |  010 – 0 = 1025 – 10 = 1538 – 25 = 1348 – 38 = 1055 – 48 = 7 |

2.

|  |  |  |
| --- | --- | --- |
| Units Consumed | MU | TUTU = ∑MU |
| 123456 | 96420-2 |  99 + 6 = 1515 + 4 = 1919 + 2 = 2121 + 0 = 2121 - 2 = 19 |

3.

|  |  |  |
| --- | --- | --- |
| Units  | TU (in utils)TU = ∑MU | MUMUn = TUn – TUn-1 |
| 12345 | 16**28****36****42**40 | **16**1286**-2** |

4.

|  |  |  |
| --- | --- | --- |
| Units Consumed | MUX (in ₹) | Price (PX) (in ₹) |
| 1234 | 1210**8**6 | 88**8**8 |

 Consumer will purchase **3 units** because at 3rd unit, MU = Price.

* The consumer will not purchase less than 3 units as MU > Price and there is scope for increasing the total satisfaction by purchasing more units.
* Similarly, consumer will not buy more than 3 units as MU < Price and total satisfaction can be increased by purchasing less quantity.

5. Consumer will purchase **4 units** because at 4th unit, MU = Price.

* The consumer will not purchase less than 4 units as MU > Price and there is scope for increasing the total satisfaction by purchasing more units.
* Similarly, consumer will not buy more than 4 units as MU < Price and total satisfaction can be increased by purchasing less quantity.

6. Let us first calculate MU in terms of money (MUX).

Given : Value of 5 utils = ₹ 1, i.e. MUM = 5. We know: MUX = $\frac{MU in Utils}{MU\_{M}}$

|  |  |  |  |
| --- | --- | --- | --- |
| Units of x Consumed | Price of x (₹) | Marginal Utility(in utils) | Marginal Utility in ₹ (MUX)5 utils = ₹ 1 |
| 123**4**5 | 444**4**4 | 504030**20**10 | 50 $÷$ 5 = 1040 $÷$ 5 = 830 $÷$ 5 = 6**20** $÷$ **5 = 4**10 $÷$ 5 = 2 |

Consumer will purchase **4 units** because at 4th unit, MU = Price.

* The consumer will not purchase less than 4 units as MU > Price and there is scope for increasing the total satisfaction by purchasing more units.
* Similarly, consumer will not buy more than 4 units as MU < Price and total satisfaction can be increased by purchasing less quantity.

7. Given: Price (PIC) = ₹ 30; Marginal utility from eating 3rd ice-cream = 90 utils. Value of 3 utils = ₹ 1, i.e. MUM = 3.

MU in terms of Money (MUIC) = $\frac{MU in utils}{MU\_{M}}$ = $\frac{90}{3}$ = 30

Laxmi should not consume any more ice-creams as the condition for consumer equilibrium “MUIC = PIC” is satisfied at 3rd ice-cream.

8. To maximize the total utility, Rakesh should purchase that combination of both the goods, when:

1. MU of last rupee spent on each commodity is same, i.e. $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$; and
2. MU falls as consumption increases.

It happens when Rakesh purchases 6 units f Y and 2 units of X. at this combination:

* MU from last rupee (i.e. 8th rupee) spent on commodity X gives the same satisfaction of 10 utils as given by last rupee (i.e. 7th rupee) spent on commodity Y; and
* MU of each commodity falls as consumption increases.

The total satisfaction of 1077 utils (= 19 + 17 + 15 + 13 + 12 + 11 + 10 + 10) will be obtained.

9. A consumer in consumption of two commodities is at equilibrium when: $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$.

Putting the given values in the equilibrium condition: $\frac{MU\_{X}}{5}$ = $\frac{16}{4}$; $\frac{MU\_{X}}{5}$ = 4; MUX = 20.

10. A consumer in consumption of two commodities is at equilibrium when: $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$.

Putting the given values in the equilibrium condition: $\frac{30}{6}$ = $\frac{20}{P\_{Y}}$; $P$Y = 4.

11. Given PX  = 5; PY = 6 and MUX = 35, MUY = 30. A consumer will be in equilibrium when $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$.

Substituting values, we find that: $\frac{35}{5}$ > $\frac{30}{6}$ or $\frac{MU\_{X}}{P\_{Y}}$ = $\frac{MU\_{Y}}{P\_{Y}}$.

Since per rupee MUX is higher than per rupee MUY, consumer is not in equilibrium. The consumer will buy more of X and less of Y. As a result MUX will fall and MUY will rise. The reaction will continue till $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$ are equal and consumer is in equilibrium.

13. In case of free ice-cream, consumer will carry on the consumption till his total utility is maximum. It means, till an additional ice-cream yields positive satisfaction, consumer will keep on having ice-creams.

As seen in the given diagram, consumer will stop the consumption at the point of satiety (Point ‘K’), i.e., where marginal utility is equal to zero. In the given diagram, this happens at the 5th ice-cream.

14. The given statement is refuted. Law of diminishing marginal utility will operate only when consumption is a continuous process. For example, if one burger is consumed in the morning and another in the afternoon, then the second burger may provide equal or higher satisfaction as compared to the first one.

15. The given statement is refuted. TU increase, when MU is positive, whereas, TU decrease, when MU is negative.

16. (i) TU will increase, but a diminishing rate; (ii) TU will be maximum; (iii) TU starts to fall.

17. In case of two goods X and Y, a consumer will be at equilibrium when $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$. When price of X falls, then rupee worth of satisfaction from X will be more than Y, i.e. $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$. Therefore, he will buy more of X and less of Y. This will lead to fall in MUX and rise in MUY. the consumer will continue to buy more of X till $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$.

18. Zero

19. Initial Utility

20. Increases

21. ₹ 10

22. Disutility

23. Maximum

24. Zero

25. Maximum

26. 420

27. (a) $\frac{MU\_{X}}{P\_{X}}$ = $\frac{MU\_{Y}}{P\_{Y}}$

28. (a) Total Utility

29. (a) $\frac{Marginal Utility in utils}{Marginal Utility of one rupee}$

30. (b) Decreases

31. (c) Buy more of X and less of Y

32. (a) Zero

33. (b) Maximum

34. (d) MUn = TUn – TUn-1

35. (d) MUX = PX

36. (c) Both (a) and (b)

37. (b) MU is Zero

38. (c) Utils

39. (a) Measured

40. (d) Law of Diminishing Marginal Utility

41. (a) 330

42. (c) Same

43. (c) Satisfaction gained from consuming such product

44. (d) All of these

45. (b) 25

46. (d) Either (a) or (b)

47. (d) Can be positive or negative or zero

48. (c) -1 util

49. (c) TU falls and MU falls and becomes negative

50. (b) No time gap

51. (d) ₹ 12

52. (c) Price of the Commodity

53. (b) The utility from the last unit consumed

54. (a) The sum of marginal utilities

55. (b) Marginal Utility is Zero

56. (b) MU is zero

57. (c) ₹ 12

58. (c) Maximum

59. (b) Law of Diminishing Marginal Utility

60. (d) All of these

61. (b) TU is zero when MU is zero.

**Consumer’s Equilibrium (Indifference Curve)**

Q 1. What do you mean by ‘monotonic preferences’?

Q 2. If a consumer has monotonic preferences, can she be indifferent between the bundles (10,8) and (8,6)?

Q 3. Suppose a consumer’s preferences are monotonic. What can you say about her preference ranking over the bundles (10,10), (10,9), and (9,9)?

Q 4. Suppose your friend is indifferent to the bundles (5,6) and (6,6). Are the preferences of your friend monotonic?

Q 5. Explain the concept of Marginal Rate of Substitution (MRS) by giving an example. Explain its behaviour along an indifference curve.

Q 6. ‘An indifference curve does not touch either of the axes’. Defend or Refute.

Q 7. Identify which of the following is not true for the Indifference Curves. Give valid reasons for choice of your answer:

1. Lower indifference curve represents lower level of satisfaction.
2. Two regular convex to origin indifference curves can intersect each other.
3. Indifference curve must be convex to origin at the point of tangency with the budget line at the consumer’s equilibrium.
4. Indifference curves are drawn under the ordinal approach to consumer equilibrium.

Q 8. Explain the following conditions:

1. Movement along the same indifference curve.
2. Shift from a lower to a higher indifference curve.

Q 9. Discuss briefly the following properties of an indifference curve, using diagram:

1. Convexity to origin
2. Downward sloping from left to right

Q 10. Indifference Map refers to \_\_\_\_\_\_\_\_\_ of indifference curves.

Q 11. Higher indifference curve represents larger bundle of goods, i.e. more utility because of \_\_\_\_\_\_\_\_\_\_\_\_.

Q 12. Slope of an Indifference Curve is measured by \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Q 13. According to Indifference Curve Approach, utility can be measured in terms of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Answer**

1. Monotonic preferences imply that a consumer always prefers the combination, which has either more of both goods or more of at least one good and no less of the other good as compared to another bundle.

2. No, if a consumer has monotonic preferences, then bundle (10,8) should be preferred instead of bundle (8,6) as bundle (10,8) has more of both goods.

3. If a consumer has monotonic preferences, then her preferences will rank as follows:

1st (10,10) 2nd (10,9) 3rd (9,9)

4. No, the preferences are not monotonic. Monotonic preference means that he should prefer (6,6) over (5,6) as it contains more of one commodity and no less of the other.

5. MRS refers to the rate at which the commodities can be substituted with each other, so that total satisfaction of the consumer remains the same.

Example: Let the two goods be X and Y. given a certain consumption of X and Y, suppose consumer wants one more unit of X. With increase in one more unit of X, marginal utility of X will reduce. As a result, consumer will be willing to sacrifice less units of Y. As he goes on obtaining more and more of X, marginal utility of X goes on falling and thus, consumer is willing to sacrifice less and less of Y.

Marginal Rate of Substitution diminishes as the consumer moves downward along the same indifference curve. It shows that consumer is willing to sacrifice lesser units of a Good Y, in order to gain one additional unit of Good X. This happens due to the operation of law of diminishing marginal utility.

6. The given statement is defended. It happens because indifference curve analysis assumes consumption of two goods.

* In indifference curve touches Y-axis, it would mean that consumption of commodity on the X-axis is zero.
* Similarly, if indifference curve touches X-axis, it would mean that consumption of commodity on the Y-axis is zero.

7. Out of the given options, (b) is incorrect. Indifference Curves have a property that two ICs cannot intersect. Suppose, there are any two ICs intersecting each other. As per the figure:



A = C (on IC1)

D = E (on IC2)

But if we see the peculiarity of point B (the point f intersection), this would result into absurd situation of A = C = B & D = C = B, which is not possible, as they are violating the basic definition of the Indifference Curves.

8. (a) Movement along the same indifference curve shows various bundles of two goods that provide equal satisfaction to the consumer. In order to increase the consumption of one commodity, the consumer has to sacrifice the consumption of the other and he moves up or down on the same indifference curve.

(b) A consumer will shift from lower indifference curve to a higher indifference curve when he wants to have a new bundle of two goods, which has more quantity of at least one good and no less of the other good (monotonic preference). Alternatively, the new bundle may offer more quantity of both the goods, thereby providing the consumer greater level of satisfaction.

9. (a) An indifference curve is convex to the origin due to Diminishing Marginal Rate of Substitution.



In the above diagram, the consumer is willing to sacrifice lesser and lesser units of good Y to gain one additional unit of good X.

(b) An Indifference curve is downward sloping, i.e. indifference curve is negatively sloped.



This property signifies that to remain on the same level of satisfaction, the consumer must forego units of one good if he wishes to consume more units of the other good.

10. Family

11. Monotonic Preference

12. Marginal Rate of Substitution

13. Ranks

**Consumer’s Equilibrium (Budget Line)**

Q 1. What do you mean by the budget set of a consumer?

Q 2. What is budget line?

Q 3. Explain why the budget line is downward sloping?

Q 4. A consumer wants to consume two goods. The prices of the two goods are ₹ 4 and ₹ 5 respectively. The consumer’s income is ₹ 20.

1. Write down the equation of budget line.
2. How much of good 1 can the consumer consume, if she spends her entire income on that good?
3. How much of good 2 can she consume, if she spends her entire income on that good?
4. What is the slope of the budget line?

**Question 5, 6 and 7 are related to Question 4.**

Q 5. How does the budget line change if the consumer’s income increases to ₹ 40 but the prices remain unchanged?

Q 6. How does the budget line change if the price of good 2 decreases by a rupee but the price of good 1 and the consumer’s income remain unchanged?

Q 7. What happens to the budget set if both the prices as well as the income double?

Q 8. Suppose a consumer can afford to buy 6 units of good 1 and 8 units of good 2 if she spends her entire income. The prices of the two goods are ₹ 6 and ₹ 8 respectively. How much is the consumer’s income?

Q 9. Suppose a consumer wants to consume two goods which are available only in integer units. The two goods are equally priced at ₹ 10 and the consumer’s income is ₹ 40.

1. Write down all the bundles that are available to the consumer.
2. Among the bundles that are available to the consumer, identify those which cost her exactly ₹ 40.

Q 10. A consumer’s income is ₹ 200. He spends it on purchase of goods X and Y. prices of X and Y are ₹ 40 and ₹ 20 per unit respectively. Answer the following questions:

1. Write down the equation of his budget line.
2. Write two such combinations of X and Y which lie on the budget line.
3. Write two such combinations of X and Y which is a part of his budget set but do not lie on his budget line.

Q 11. A consumer has total money income of ₹ 250 to be spent on two goods X and Y with prices of ₹ 25 and ₹ 10 per unit respectively. On the basis of the information given, answer the following questions:

1. Give the equation of the budget line for the consumer.
2. What is the value of slope of the budget line?
3. Calculate X and Y intercept.
4. How many units can the consumer buy if he is to spend all his money income on good X?
5. How does the budget line change if there is a fall in price of good Y?

**Answer**

1. Budget set is the set of all possible combinations of the two goods which a consumer can afford, given his income and prices in the market.

2. Budget line is a graphical representation of all possible combinations of two goods which can be purchased with given income and prices such that the cost of each of these combinations is equal to the money income of consumer.

3. The budget line is downward sloping as more of one good can be bought by decreasing some units of the other good with the given money income.

4.(a) Let the two goods be x and y.

Given: Price of x (PX) = ₹ 4; Price of y (PY) = ₹ 5; Income of the consumer = ₹ 20. Now, the equation of budget line will be: 4x + 5y = 20

(b) If the entire income is spent on good 1 (say, good x), then the quantity consumed of good y will be zero. The revised budget line will be: 4x + 5 (0) = 20 or x = 5 units.

So, the consumer will buy 5 units of good 1 (good x).

(c) If the entire income is spent on good 2 (say, good y), then the quantity consumed of good x will be zero. The revised budget line will be: 4(0) + 5y = 20 or y = 4 units.

So, the consumer will buy 4 units of good 2 (good y).

(d) The slope of budget line measures the amount of change in good 2 required per unit of change in good 1 along the budget line. It is measured as follows:

Slope = $\frac{-P\_{1}}{P\_{2}}$ = $\frac{-P\_{X}}{P\_{Y}}$ = $\frac{-4}{5}$ = - 0.8

**Question 5, 6 and 7 are related to Question 4.**

5. If consumer’s income increases to ₹ 40, then the consumer can buy more of both the goods. It will shift the budget line towards right from AB to A1B1. But, new budget line will be parallel to the old budget line as there is no change in slope (i.e. price ratio) of budget line.



6. When price of good 2 decreases, then the budget line will shift to the right from AB to AB1. The new budget line meets the X-axis at the same point A because there is no change in the price of good 1. But it will touch the Y-axis to the right of B at point B1 because the consumer can purchase more of good 2 at the same income level.



7. There will be no change in the budget set. In the example given in question 4, the budget line is represented by the equation: 4x + 5y = 20. If prices as well as the income double, then new budget line will be: 8x + 10y = 40 ⇒ 2(4x + 5y) = 2(20) ⇒ 4x + 5y = 20

Therefore, there will be no change in the budget set and the budget line.

8. Suppose, the equation of budget line is PXX + PYY = M

(Where X = good 1; PX = Price of X; Y = good 2; PY = Price of Y; and M = Income)

Putting values in the equation, we get:

₹ 6 × 6 + ₹ 8 × 8 = M, i.e. Income (M) = ₹ 100

9. (a) Given P1 = P2 = ₹ 10 and Income (M) = ₹ 40. The various bundles that are available to the consumer are: (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) and (4,0).

(b) Bundles, which cost exactly ₹ 40 are: (0,4), (1,3), (2,2), (3,1) and (4,0).

10. (a) Given: Price of x (PX) = ₹ 40; Price of y (PY) = ₹ 20; Income of the consumer = ₹ 200. Now, the equation of budget line will be: 40x + 20y = 200.

(b) (i) 1x + 8y; (ii) 2x + 6y.

(c) (i) 1x + 2y; (ii) 2x + 2y.

11. (a) PXQX + PYQY = M; 25QX + 10QY = 250

(b) Slope of Budget Line = (-) PX / PY = (-) 25/10 = (-) 2.5

(c) Intercept on X-axis = M/PX = 250/25 = 10; Intercept on Y-axis = M/PY = 250/10 = 25

(d) If QY is to be zero; 25QX + 10QX = 250; 25QX + 10(0) = 250; QX = 250/25 = 10 units.

(e) If Py falls, the consumer will be able to buy more of good Y in the same money income pushing the Y-intercept of the Budget Line away from origin, keeping the X-intercept constant.