

Subject: Microeconomics (Class 11)

Max Marks: 30

Document: Detailed Answer Key & Marking Scheme

Chapter: Consumer's Equilibrium

SECTION A: MULTIPLE CHOICE ANSWERS

Q1. Correct Option: (c) Maximum

Explanation: According to the Law of Diminishing Marginal Utility, when MU reaches zero, it implies that the consumer has derived maximum possible satisfaction from the consumption of that good. Hence, Total Utility (TU) reaches its peak point (Satiety point).

Q2. Correct Option: (b) Diminishing Marginal Rate of Substitution

Explanation: An Indifference Curve is convex to the origin because the consumer is willing to give up fewer and fewer units of Good Y to get one additional unit of Good X. This behavior is governed by the Diminishing Marginal Rate of Substitution (MRS).

Q3. Correct Option: (b) Rotates outwards on the X-axis

Explanation: When the price of Good X falls, the consumer's real purchasing power increases for Good X only, allowing them to buy more maximum units if total income is spent on X. The Y-intercept remains unchanged, causing the budget line to pivot/rotate outwards along the X-axis.

Q4. Correct Option: (d) Higher IC represents a higher level of satisfaction

Explanation: Due to monotonic preferences, a higher indifference curve contains larger bundles of at least one good and no less of the other, which naturally yields a higher level of satisfaction.

SECTION B: SHORT ANSWER SOLUTIONS

Q5. Law of Diminishing Marginal Utility

Answer: The Law states that as a consumer consumes more and more standard units of a commodity continuously, the marginal utility derived from each successive unit declines.

Real-life Example: If a very thirsty person drinks successive glasses of water, the first glass gives immense satisfaction (very high MU). The second glass gives relatively less satisfaction, and by the fourth or fifth glass, the desire drops to zero ($MU = 0$).

Marking Scheme: 1.5 Marks for definition/statement, 1.5 Marks for a clear, contextual example.

Q6. Budget Line & Shifts

Answer: A Budget Line is a graphical representation of all possible combinations of two goods that a consumer can purchase with a given income and prices of both goods, such that the total cost equals total monetary income ($P_x \cdot X + P_y \cdot Y = M$).

Factors causing a parallel shift:

1. **Change in Consumer's Income:** An increase shifts it parallelly outwards; a decrease shifts it parallelly inwards.
2. **Proportional Change in Prices:** If the prices of both Good X and Good Y change by the exact same percentage simultaneously.

Marking Scheme: 1 Mark for definition, 1 Mark each for identifying the two shift factors.

Q7. Monotonic Preferences

Answer: Monotonic preference means that a rational consumer always prefers a bundle that has more of at least one good and no less of the other good compared to any other bundle. It assumes that "more is always better" because more consumption yields higher satisfaction.

Higher IC preference: Since a higher IC lies above and to the right of a lower IC, it represents combinations with larger quantities of goods. By virtue of monotonic preferences, the consumer prefers higher ICs for maximum satisfaction.

Marking Scheme: 1.5 Marks for defining monotonic preferences, 1.5 Marks for linking it clearly to higher IC layout.

SECTION C: LONG ANSWER SOLUTIONS

Q8. Consumer's Equilibrium Conditions (IC Analysis)

Answer: A consumer reaches equilibrium under Indifference Curve Analysis when two conditions are fulfilled simultaneously:

1. **First Condition (Necessary Condition):** $MRS_{xy} = P_x / P_y$.
The Marginal Rate of Substitution (slope of IC) must equal the price ratio of the two goods (slope of the budget line). This indicates the rate at which the consumer is willing to exchange goods equals the market rate.
2. **Second Condition:** MRS must be continuously diminishing at the point of equilibrium. This ensures that the Indifference Curve is strictly convex to the origin at that point. If it is not diminishing, equilibrium will not be stable.

Marking Scheme: 2 Marks for the first condition with equation, 2 Marks for explaining the convexity/diminishing MRS condition.

Q9. Numerical Solution (Two-Commodity Equilibrium)

Given parameters: $P_x = ₹4$, $P_y = ₹2$, and $Income (M) = ₹14$.

To solve, compute the ratios of MU_x / P_x and MU_y / P_y for each unit level:

Units	MU_x	$MU_x / P_x (MU_x / 4)$	MU_y	$MU_y / P_y (MU_y / 2)$
1	24	6	16	8
2	20	5	14	7
3	16	4	12	6
4	12	3	10	5
5	8	2	8	4

Equilibrium Check: Looking at the table, $MU_x / P_x = MU_y / P_y = 4$ when the consumer buys **2 units of Good X** and **5 units of Good Y** (where MU_y / P_y at unit 5 is $8/2 = 4$).

Income Verification Check: Total spending = $(P_x \times X) + (P_y \times Y) = (4 \times 2) + (2 \times 5) = 8 + 10 = ₹18$. This exceeds the total income of ₹14.

Alternative Equilibrium Check: Let's check where the consumer purchases **2 units of Good X** (ratio=5) and **4 units of Good Y** (ratio=5).

Total spending = $(4 \times 2) + (2 \times 4) = 8 + 8 = ₹16$ (Still exceeds ₹14).

Correct Budget Constraint Allocation: Let's look at the combination of **2 units of Good X** and **3 units of Good Y**: Expenditure = $(4 \times 2) + (2 \times 3) = 8 + 6 = ₹14$.

At this point, $MU_x / P_x = 20 / 4 = 5$, and $MU_y / P_y = 12 / 2 = 6$. The student will notice that budget balance checks are essential alongside utility equivalence matches.

Marking Scheme: 2 Marks for accurate table columns calculation, 2 Marks for providing final unit distribution mapping income.

SECTION D: CASE-BASED / ASSERTION-REASONING

Q10. Correct Option: (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

Explanation: When $MU_x / P_x > MU_y / P_y$, the consumer gets more satisfaction per rupee spent on Good X than on Good Y. A rational consumer will buy more of Good X. As a result of increased consumption, the Marginal Utility of X will begin to fall. This process continues until the ratio declines enough to pull level with Good Y, restoring consumer equilibrium. Thus, the reasoning perfectly justifies the assertion.

Marking Scheme: 4 Marks for correct choice selection along with the operational microeconomic reasoning logic.

~ End of Answer Key ~

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