16/6/21

Consumer's Equilibrium

Q1) what do you mean by utility?

Ans) Utility refers to the power of any commodity that can satisfy human wants. It differs from person to person and place to place. This utility can be measured in terms of utils cardinally.

Q2) what is total utility

Ans) It refers to the total satisfaction from consumption of all possible units of commodity in terms of utils. For example ⇒ A consumer consume 3 icecream, $U_1 = 20$ units, $U_2 = 15$ units, $U_3 = 11$ units

$$TU = U_1 + U_2 + U_3 = 20 + 15 + 11 = 46 \text{ utils}$$

Q3) what do you mean by Marginal utility?

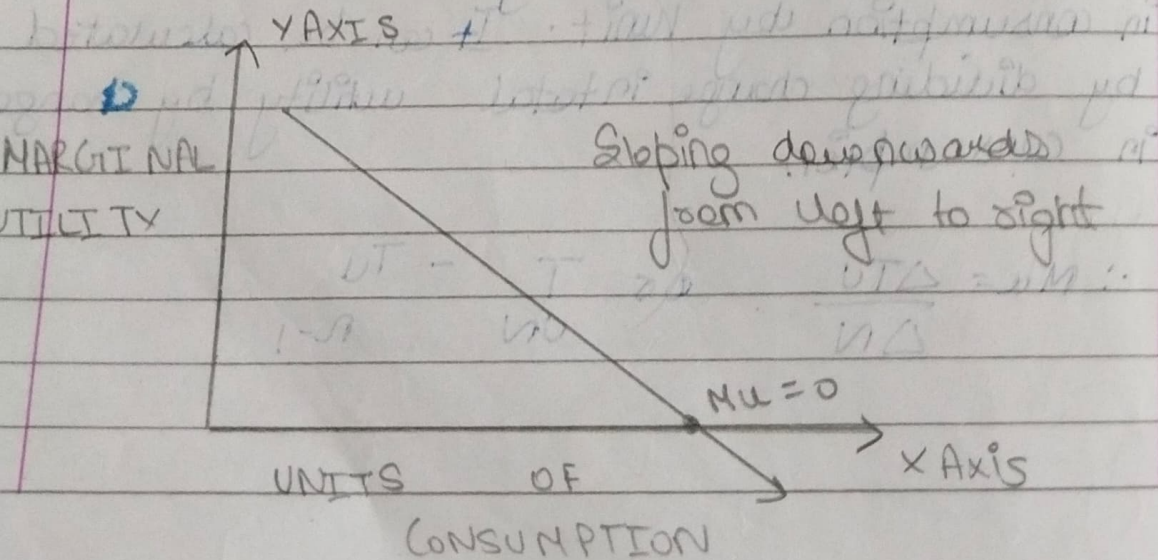
Ans) It is the additional utility derived from consumption of one more unit of a commodity. In other words change in total utility due to additional in consumption by 1 unit. It can be calculated by dividing change in total utility by change in consumption

$$\therefore MU = \frac{\Delta TU}{\Delta N} \quad \text{or} \quad \frac{TU_N - TU_{N-1}}{}$$

Q4) what do you mean by 'Law of Dimishing Marginal utility'?

Ans 4) Law of Dimishing Marginal utility states that as we consume more and more units of a commodity the utility derived from each successive unit keeps on diminishing. In other words when a consumer consumes more and more units of a given commodity the marginal utility keeps on diminishing. For example ⇒ A Hungry boy eats first chapati gets high amount of utility and with his next consumption of chappati the utility falls and keeps on falling with further consumption. This can be illustrated as following ⇒

Units	Tu	Mu
1	10	10
2	18	8
3	24	6
4	28	4
5	30	2
6	30	0
7	28	-2



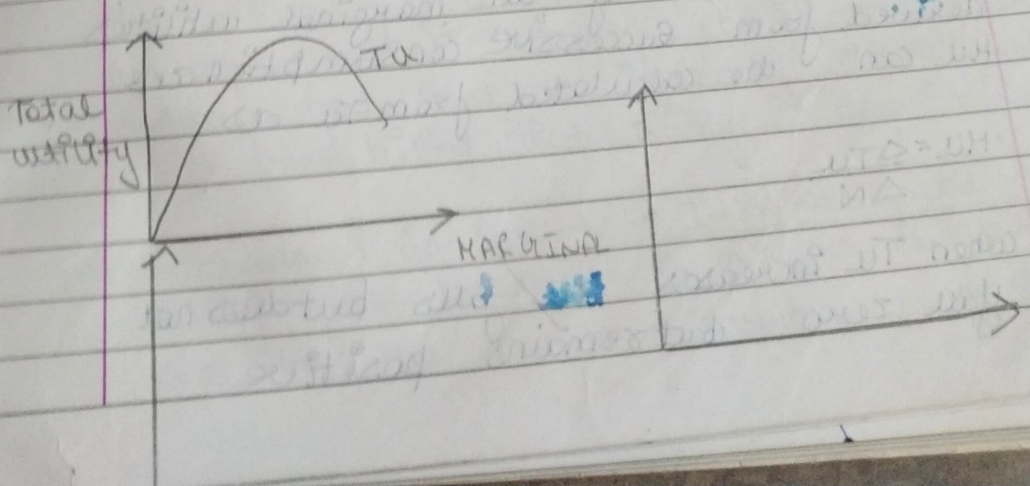
Q5) Explain the relation between Total utility and Marginal utility?

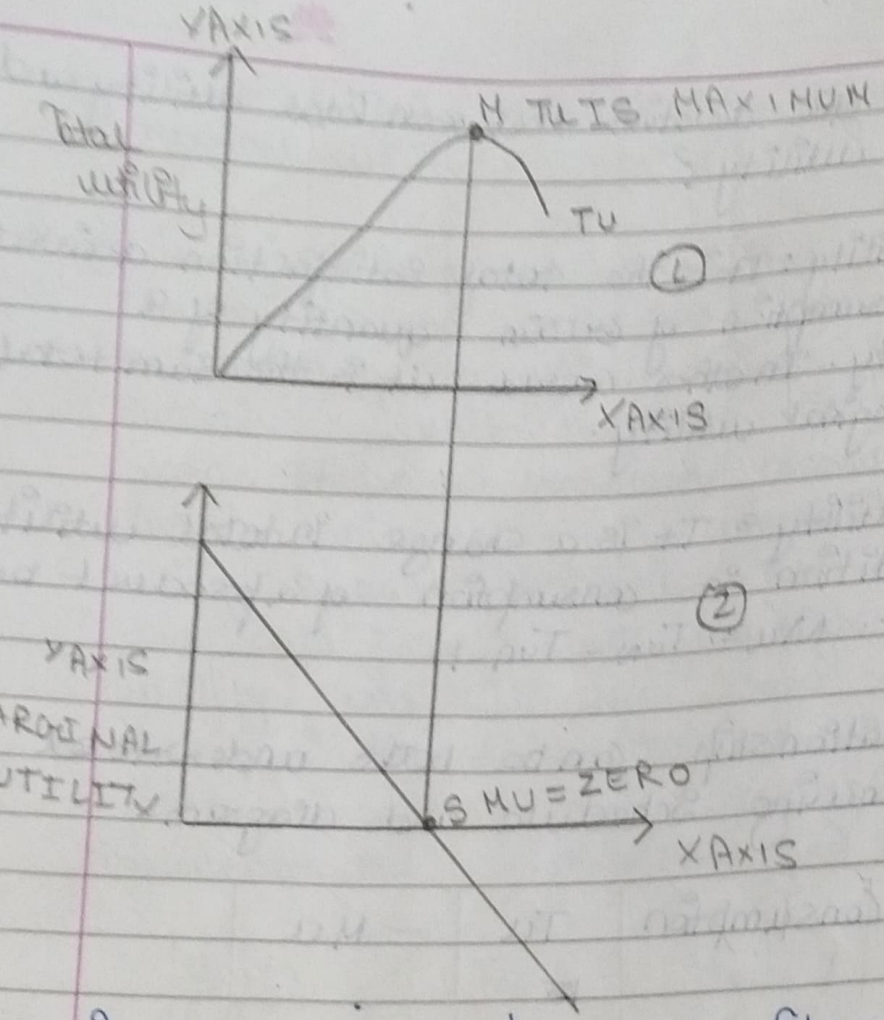
Ans5) Total utility: It is the total satisfaction derived from consumption of certain quantity of a commodity. In other words it is the sum total of all marginal utility.

Marginal utility ⇒ It is a change in total utility due to addition in consumption of a product by one unit. $MU_n = TU_n - TU_{n-1}$

This relationship can be both understood with following schedule and diagram

Units of Consumption	TU	MU
1	10	10
2	18	8
3	24	6
4	28	4
5	30	2
6	30	0
7	28	-2





In this diagram figure I shows total utility curve that first slopes upwards and reaches its maximum point M and then slopes downwards. Figure 2 shows a downward MU curve from left to right

tion

1) TU is the sum of all marginal utilities derived from successive consumption and MU can be calculated from TU as

$$MU = \frac{\Delta TU}{\Delta N}$$

2) when TU increases MU falls but does not fall zero but remains positive

(3) when TU reaches at its maximum as shown by point M and in diagram MU becomes zero and it intersects X axis

(4) when TU starts falling with further increase in consumption, MU becomes negative and MU curve goes below ox axis as shown in diagram after point M.

Q6) what are the assumptions of 'Law of Diminishing Marginal utility'?

Ans6) Following are the assumptions ⇒

(1) Cardinal Measurement of Utility ⇒ It is assumed that utility can be measured and expressed in quantitative terms of utils.

(2) Monetary Measurement of Utility ⇒ It is assumed that utility can be measured in monetary terms of money

(3) Continuous Consumption ⇒ It is assumed that consumption is a continuous process and there is no time gap between the two successive consumption. For instance one is consumed on Monday, and next on Tuesday, there will be a possibility that utility doesn't fall

(4) No change in Quality ⇒ It is assumed that quality of the product is similar i.e. all the units that the consumer consumes are of same

same quality because if the quality changes or improves the utility may not fall as the consumer would always like to have more of a better quality product

(5) Rational Consumer ⇒ we assume that our consumer is a rational consumer who calculate, compares the utility and wish to maximize the same

6. Independant utility ⇒ It is assumed that all the units consumed by consumer are independant ie. Mu of one commodity has no relation with Mu of another commodity. It is also assumed that utility of one person is not effected by utility of another

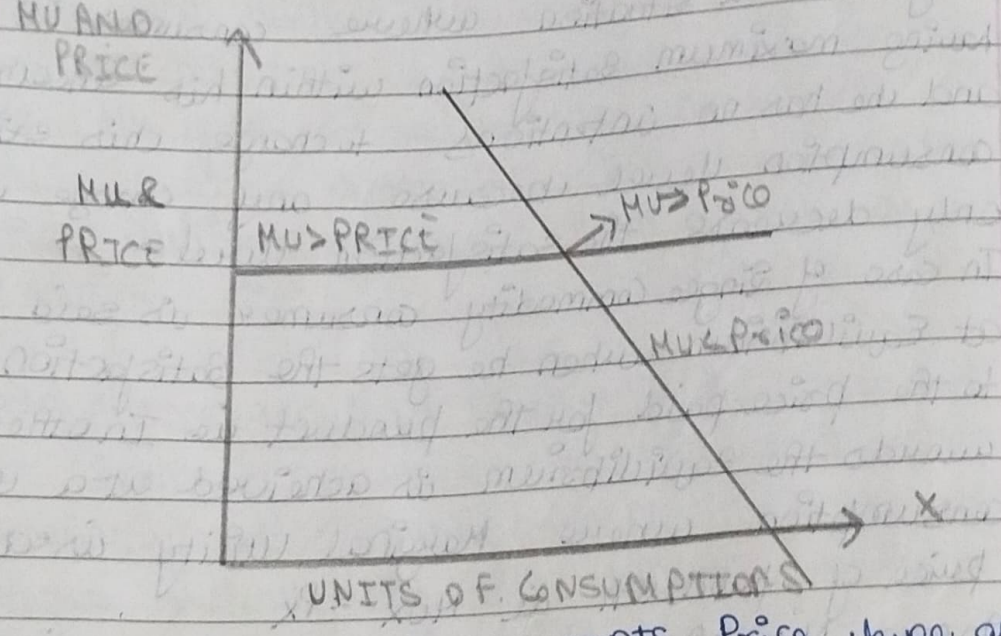
7. Fixed income and Fixed Prices ⇒ It is assumed that income of consumer and Price of commodity remains fixed. In case price of given commodity changes or when the price falls the marginal utility may not fall with successive consumption

8. Perfect Knowledge ⇒ we assume that our consumer knows perfectly about the commodities he can buy and the utility that he can ~~buy~~ derive from all consumptions.

Q7) What do you mean by Consumer's Equilibrium in case of Single Commodity :

Ans) The term 'Equilibrium' means a state of balance or a state of rest a position of no change. And consumer's equilibrium refers to a state or level of consumption at which consumer gets maximum satisfaction and the/She doesnot want to change the consumption. In other words consumer equilibrium refers to a situation where consumer is having maximum satisfaction within his income and he has no intentions to change this existing consumption level because any change will only decrease the satisfaction level.
In case of Singee Commodity consumer is said to be at Equilibrium when he gets the satisfaction equal to the price paid for the product ie In other words the equilibrium is acheived at a level of consumption where Marginal Utility is equal to price of product ie: $MUX = PX$
In case $MUX > PX$ that means consumer is willing to buy more of x since the utility she derived is more than price paid for same.
on the other hand if $MUX < PX$ that is a state where she has consumed more and utility has fallen below the price paid of a commodity. The equilibrium situation can further be explained with the help of following schedule and digram

Unit	Price	TU	MU
1	4	10	10
2	4	18	8
3	4	24	6
4	4	28	4
5	4	30	2
6	4	30	0
7	4	28	-2
	4		



In this diagram P represents Price curve and MU represents marginal utility curve. Price line is straight line showing fix price and MU simply downwards due to law of Dimishing Marginal utity E is the point where price is equal to the state of equilibrium.

In this concept what could not be considered is the marginal utility money assuming MU of money is ₹1 and constant. The condition for equilibrium will be $\frac{MUx}{PUx} = MUM$

By dividing MUX by Px we can convert it to Qty into monetary term and equated the same with MUM

Consumer's Equilibrium (Continuation)

Q8) Explain consumer's Equilibrium in case of two commodities

Ans) In real life consumer do not consume only one commodity, he actually consumes many. Let us take a situation where our consumer consumes only two commodities. In such a case law of equi Marginal utility helps in determing the level of equilibrium. As per this law consumer gets maximum satisfaction where ratio of MU of 2 commodities and their respective prices are equal MU falls with increase in consumption. So two important conditions of consumer Equilibrium are :-

(i) Ratio of MU to price is same for both the goods In case of single commodity we know consumer's Equilibrium is $\frac{MUx}{PUx} = MUM$

So in case of two commodities say X and x condition will be

$$\frac{MUx}{Px} = \frac{MUx}{Px} \quad MU_M$$

Suppose $\frac{MUx}{Px} > \frac{MUy}{Py}$, in this case the consumer is getting more Marginal utility per rupee in case of good x as compare to good x. Therefore he will buy more of x and less of y. This will lead to fall in MUx and rise in MUy this will continue till the time $\frac{MUx}{Px}$ becomes equal to $\frac{MU}{Px}$

opposite will happen if $\frac{MUx}{Px} < \frac{MUy}{Py}$

(2) MU falls as consumption increases: This is the second condition required to attain the consumer equilibrium i.e MU of a product must fall as more of it are consumed. If it does not fall the consumer will end up buying only one good which is unrealistic and consumer will never reach at consumer's equilibrium.

This can further be explained with the help of following schedule:

Unit	MUx	MUy
1	20	16
2	14	12
3	12	8
4	7	5
5	5	3

Above the schedule MU of x and MU of y are equal when consumer consumed 3 unit of x and 2 unit of y i.e. 12 utils.

Q) Find out the MU from following:

Unit	TU	MU
0	0	0
1	10	10
2	25	15
3	39	14
4	52	13
6.	62	10

Unit	TU	MU
1	9	6
2	15	4
3	19	2
4	21	1
0	30	-10

Units	MU	TU
1	10	10
2	8	18
3	7	25
4	6	31
5	3	34
6	0	34

Q)

Unit	TU	MU
1	16	16
2	28	12
3	36	8
4	44	6
5	40	-2

Ans)

Unit	MU	TU
1	16	16
2	12	28
3	8	36
4	6	42
5	-2	40

Q)

Units	TU	MU
1	5	—
2	9	—
3	—	3
4	14	—
5	—	1

	MU	TU
1	5	5
2	4	9
3	3	12
4	2	14
5	-10	15

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PAGE

Consumer Equilibrium

Utility Concept

Cardinal Utility
↓
where utility can be measured in terms of utils
1, utils
↓
Utility Analysis

Ordinal Utility
where products can be ranked as per satisfaction.
UA > UB > CU
↓
Indifference curve Analysis

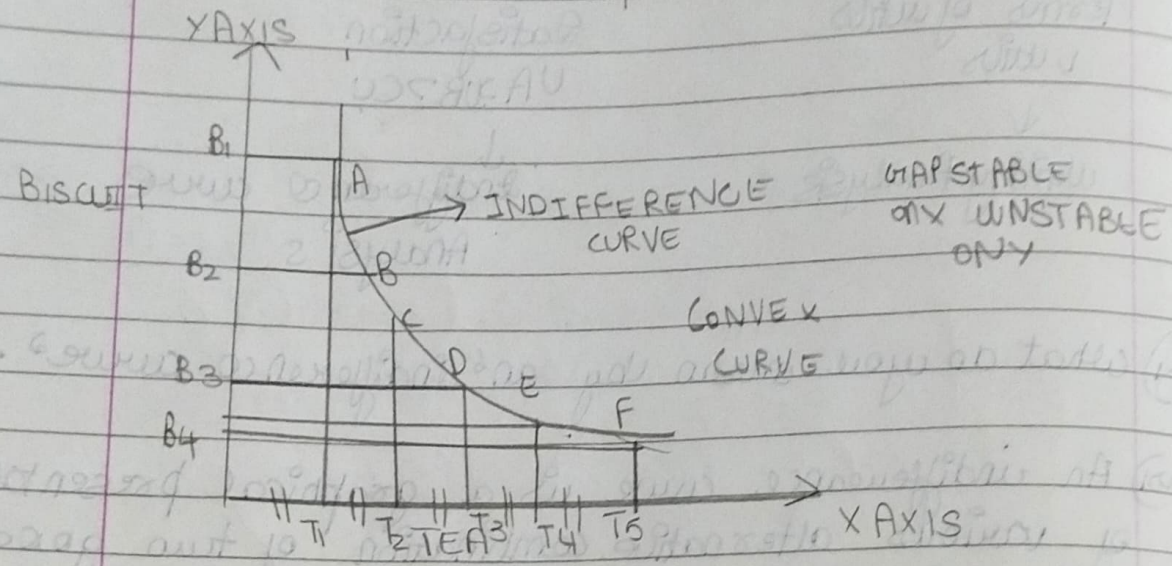
Q) What do you mean by an indifference curve?

Ans) An indifferenance curve is a graphical presentation of various alternative combination of two goods that give a similar level of satisfaction. In other words it is a locus of point that present combinations of two goods in such a way that all combinations provides similar level of utility which is why our consumer is indifferent in choosing one single one combination.
This can be illustrated further taking example of two goods X and Y that a consumer consumes all those combinations are shown through following schedule and diagram

Schedule at the back

1.

Combination	Tea	Biscuits	
A	1	20	5
B	2	15	
C	3	11	4
D	4	8	3
E	5	6	2
F	6	5	1



MAP STABLE OR UNSTABLE ONLY

In this diagram Quantity of Tea is shown on OX axis and that of biscuit on OX Axis. IC represents the indifference curve that slopes downward from left to right and it is in convex shape to origin

Q2) what are the different properties of an Indifference curve?

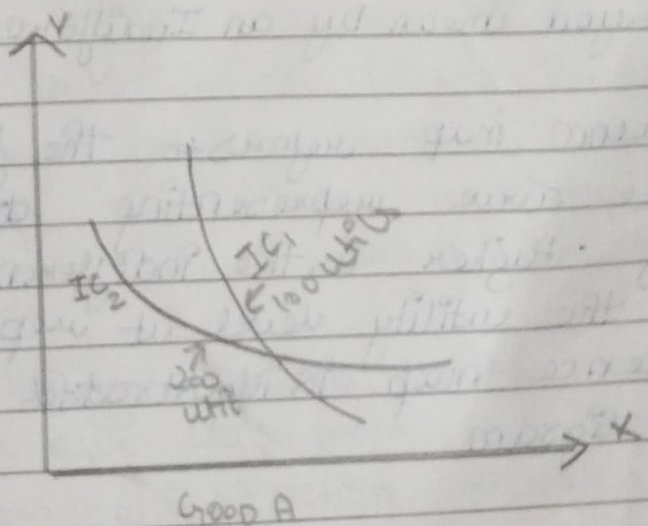
Ans2) Following are the properties ⇒

(i) They are sloping downward from left to right

A consumer when increases consumption of one he decreases that of other so that the utility level remains same. Because of this reason indifference curve slopes downwards from left to right.

(2) Higher indifference curve represents higher utility level → Every indifference curve represents a specific level of utility. And higher indifference curve means combinations with longer quantities and higher satisfaction. So higher means higher utility.

(3) They never intersect each other → As we know one indifference curve represent one utility level and 2 curve can't represent same utility so they never intersect each-other. For example → In the diagram below IC_1 represent 100 utils and IC_2 represents 200 utils. So point 'I' contradicts the utility level hence such point can't exist



4. Indifference curve is always convex to the point of origin → An IC is always convex of origin

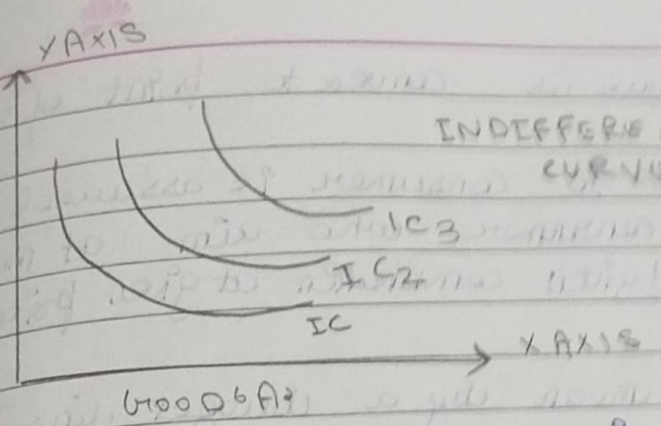
because of law of diminishing marginal rate of substitution [MRS] and MRS fall because of law of diminishing Marginal utility. So our consumer is willing to sacrifice less and less of a commodity to gain one extra unit of another commodity.

Q) what are Monotonic Prefrences?

Ans) Monotonic preferences means that a rational consumer always prefer more of a commodity as it offers him a higher level of satisfaction. In simple words it means when consumption increases utility also increases. In bundle of two commodities a consumer always prefers a bundle where atleast one of two commodity is in higher quantities
For example → In bundles (10A, 6B) & [9A and 6B] consumer will chose having higher of A.

Q4) what do you mean by an Indifference Map?

Ans) An indifference map refers to the family of indifference curve representing different level of utility. Higher is the indifference curve higher is the utility level it represents. An indifference map is illustrated through following digram



This diagram represents an indifference map having 3 ICs, IC_1, IC_2, IC_3, where IC is showing least satisfaction and IC_3 the most.

Q5) What are the assumptions of Indifference Curve?

Ans5) Following are the main assumptions

(i) Two commodity: It is a assumption that consumer has fixed amount of money, which is spent on 2 goods and price of both goods are given and constant

(ii) Non-Satiety ⇒ It is assumed that our consumer has not reached the point of Saturation, consumer always prefer more of both the commodities i.e. he always try to move to higher indifference curve to get higher level of satisfaction

3) Ordinal Utility → Ordinal utility concept is used where where our consumer can rank his preferences on the basis of satisfaction from each combination.

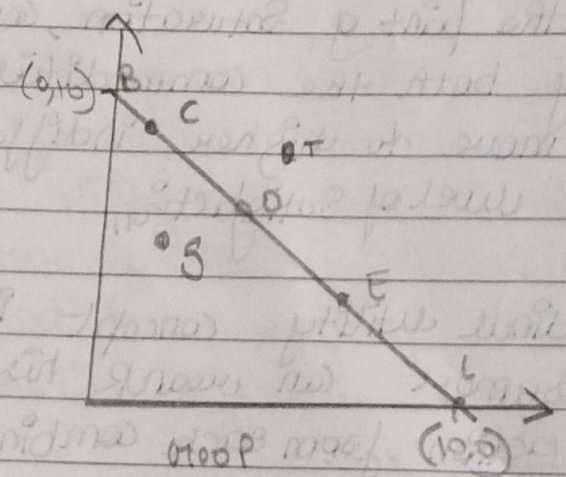
(4) Diminishing Marginal Rate of Substitution ⇒ This analysis assumes diminishing MRS due to which our

indifference curve is convex to point of origin

5 Rational Consumer → the consumer is assumed to be rational consumer who aim at maximum satisfaction of given combination at given price

Q) What do you mean by a budget line?

Ans) It is a graphical representation of all possible combinations of two goods which can be purchased with given income and price such that cost of each combination is equal to the budget of the consumer. For example → A consumer has a budget of ₹100 and he consumes good P and good Q. Good P is ₹10 per unit and good Q is ₹20/unit. If he consumes only P he will get 10 of P and get zero of Q. Similarly if he consumes good P he will get only 5 and zero Q. Now if he plot these extremes of OX and OY and join them with straight line he get budget line as shown in diagram below

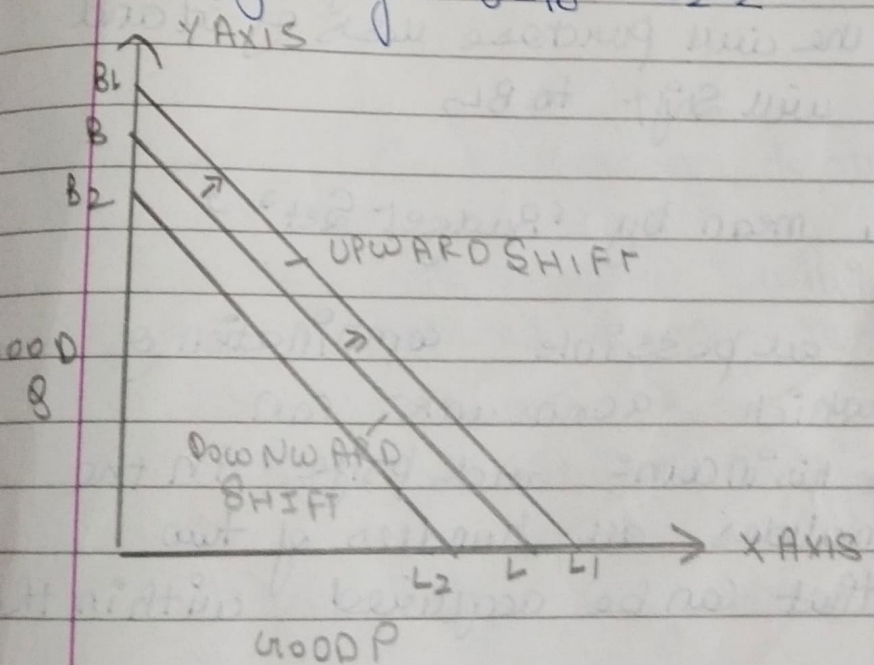


This diagram BL represents budget line showing all possible combinations of goods P and Q that can be acquired within the

given budget and given budget of ₹100. But any point like T cannot be acquired and point like S shows the combination on which total budget is not utilised

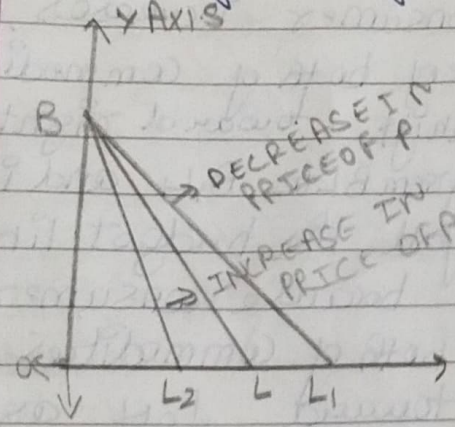
Q7) Explain the shift in Budget line on change in income of consumer?

Ans7) If there is change in income of consumer assuming no change in price of goods then the budget line will shift upward or downward parallely In case the income of consumer increases, consumer would be able to buy more of both of commodity and budget line will shift toward right as shown in digram, shift from BL to B_1L_1 and in case the income of consumer fall the budget line will shift toward left because consumer would be able to buy less of both of commodities and budget line will shift toward left as shown in diagram from BL to B_2L_2



Q8) Explain the shift in Budget line on change in price of Commodity

Ans8) If there is any change in prices of any of two commodities assuming the income as constant the budget line will shift on the respective axis where quantity of such commodity is shown. Incase price of that commodity fall the budget line will shift rightward and visa versa. This is further illustrated through following digram



In this diagram BL is the initial budget line and with decrease in price of good budget line shifts to BL_1 toward right incase the price increases consumer purchasing power for good P will fall and the will purchase less of it and budget line will shift to BL_2

Q9) what do you mean by 'Budget Set' ?

Ans9) It is a set of all possible combination of two goods which a consumer can afford given his income and prife in the market. It includes all bundles of two commodities that can be acquired within the budget.

For example: Two goods P and Q are acquired

by consumer within his budget and possible combinations are (0,10), (1,8) (2,6) (3,4) (5,0) This is a set of all bundles and this is a budget set

Q10) Explain consumer's Equilibrium by Indifference curve analysis

Ans10) Consumer's Equilibrium refers to a situation in which a consumer derives maximum satisfaction with no intention to change it with the given price and income. The maximum satisfaction is achieved by studying indifference map and Budget line together. On an indifference map higher is the indifference curve higher is the satisfaction level. So our consumer try to be at higher indifference curve subject to his/her budget constraint. To explain this following are the conditions of consumer equilibrium.

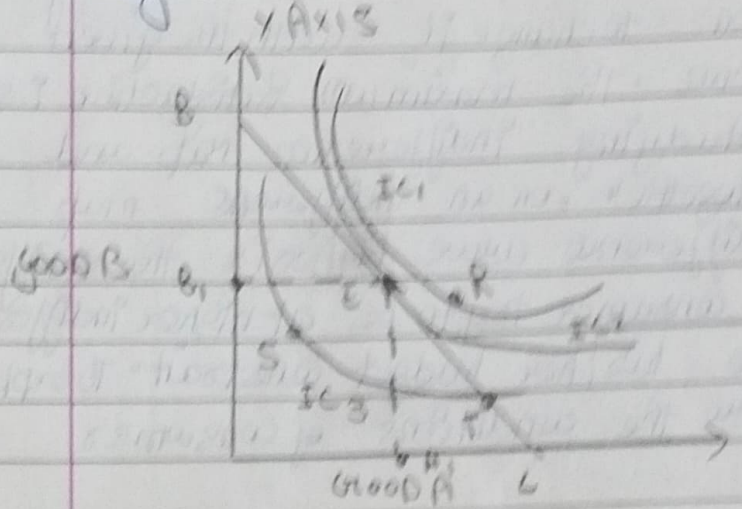
i) $MRS_x = \frac{P_x}{P_y}$ (ii) M.R.S. continuously falls

(iii) $MRS_{xy} > \frac{P_x}{P_y}$ ⇒ It means to obtained one more unit of x the consumer is willing to sacrifice more of y as compared to what is required in market. It induces consumer to buy more of x as a result MRS falls and continue to fall till it become equal to ratio of prices. On the other hand if $MRS_{xy} < \frac{P_x}{P_y}$ ⇒ It means to obtain one more unit of x consumer

loss of Y than what is required to maintain it induces consumer to buy loss of X and gain of Y till the time MRS$_{xy}$ = $\frac{P_x}{P_y}$

(2) MRS must be diminishing at the point of equilibrium i.e. It should be convex to the point of origin.

These condition of consumer's equilibrium can be understood better through following diagram



In this diagram quantity of good A is shown on ox Axis and good B is shown on oy axis. BL represents the budget line. IC_1, IC_2 and IC_3 represent an indifference map, where IC_1 shows the maximum utility, I_2 lesser and IC_3 the least

A budget line BL is tangent to IC_2 at point E which consumer consumes OA_1 quantity of good A and OB_1 of good B all other points on budget line will lie on lower indifference curve ie. IC_3 like point T. Consumer

would not opt for such combination since it does not give the maximum satisfaction. As a rational consumer, consumer would want a combination like R on IC_1 but that is beyond the budget of the consumer. So therefore our consumer would maximize satisfaction at point E where budget line is tangent to indifference curve and both the conditions of equilibrium are satisfied. at point E slope of budget line = Slope of IC

i.e. $\frac{PA}{PB} = MRS\ AB$

and also at this point MRS is diminishing.

Q1)

Units	TU	MU
1	10	10
2	25	15
3	34	9
4	40	6
5	42	2
6	40	-2

Q2)

Units	TU	MU
1	20	20 ✓
2	30	10 ✓
3	38	8 ✓
4	44	6 ✓
5	40	4 ✓
6	38	-2 ✓