Chapter – Income Determination & Multiplier

Q1. Explain the two approaches for determination of equilibrium level in an economy with assumptions.

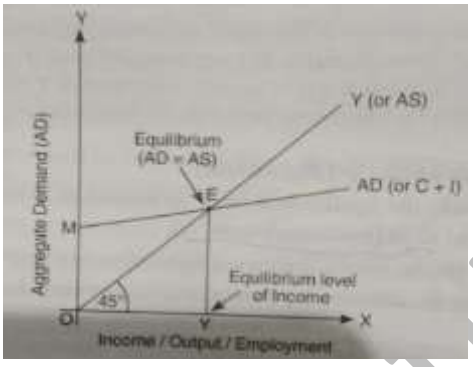
Ans. <u>ASSUMPTIONS</u>;-

1. It is assumed there is no govt. and foreign sector.
2. It is assumed that investment expenditure is autonomous.
3. Price level is assumed to remain constant.

a) **<u>APPROACH AGGREGATE DEMAND, AGGREGATE SUPPLY APPROACH</u>;-** According to this approach the equilibrium level of income in an economy is determine when aggregate demand is equal to the total output or aggregate supply.

Income	Consumption	Saving	Investment	Aggregate demand	Aggregate supply
0	40	-40	40	80	0
100	120	-20	40	160	100
200	200	0	40	240	200
300	280	20	40	320	300
400	360	40	40	400	400
500	440	60	40	480	500
600	520	60	40	560	600

Diagram: -



In the above diagram the Ad curve shows the desire level of expenditure by consumers and firms corresponding to each level of income. The economy is equilibrium at point E where C + I curve intersect the aggregate supply.

1. E is equilibrium point because at this point the level of desire spending on consumption and investment exactly the level of output.
2. OY is the equilibrium level of output.
3. The equilibrium level of income is 400. If there is any deviation from the equilibrium level of output when planned saving is not equal to planned output then some changes will occur in the economy such as.

- **<u>WHEN AD IS MORE THAN AS</u>:-** When planned spending is more than the planned output it means that consumers and firms together would be buying more goods than firms are willing to produced. As a result, the planned inventory would fall below the desired level.
  To being the inventory back to the desire level firm would increase in employment and output until the economy is back at output level OY. Where AD become equals to AS.

- **<u>WHEN AD IS LESS THAN AS</u>;-** When AD is less than AS it means that consumers and firms together would be buying less goods then firms are willing to produce. As a result, the planned inventory would rise.

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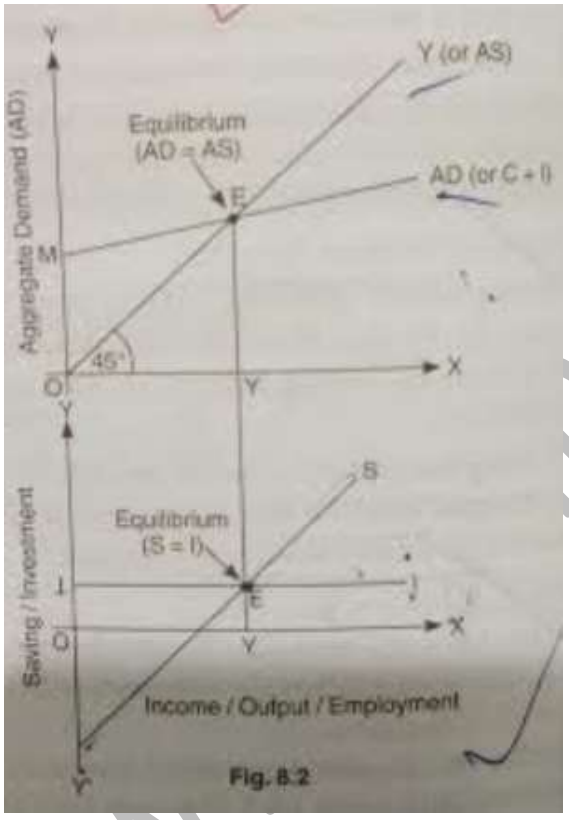
To clear the unwanted increase in inventory firms planned to decreased the employment and output. Until the economy is back at output level OY. Where AD become equal to AS.

2. **SECOND APPROACH;-**
SAVING AND INVESTMENT APPROACH;- According to this approach the equilibrium level of income is determined at a level where planned saving is equal to planned investment.

Income	Consumption	Saving	Investment
0	40	-40	40
100	120	-20	40
200	200	0	40
300	280	20	40
400	360	40	40
500	440	60	40
600	520	80	40

Diagram:



Investment curve is parallel to x-axis because of autonomous investment the saving curve slopes upward showing that income rise, saving also rises.

- The economy is in equilibrium at point E where saving and investment curve intersect each other.
- OY is the equilibrium level of output.
- If planned saving is not equal to planned investment then there will be sudden changes to bring the economy back to the equilibrium level.

1. **WHEN SAVING IS MORE THAN INVESTMENT;-** If planned saving is more than planned investment it means that households are not consuming as much as firm accepected them to. As a result, the inventory rises above the desire level of clear the wanted increase in inventory he firm would plan to reduce the production unemployment will be there.

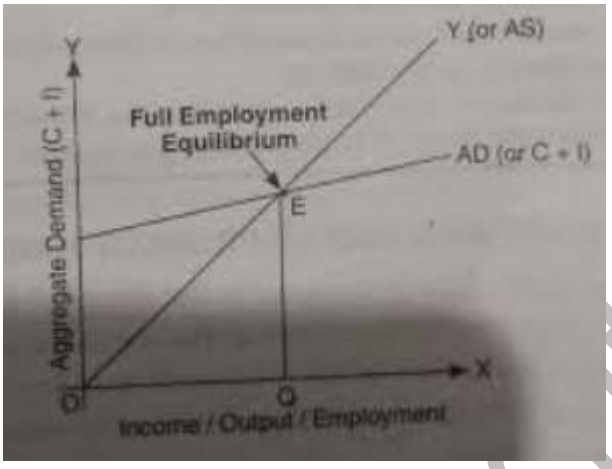
2. **WHEN SAVING IS LESS THAN INVESTMENT;-** If planned saving is less than investment it means that households are consuming more and saving less than ehat the firms expected them to. As a result, planned inventory would fall below the desire level to bring the inventory back to the desire level firm would planned to increase the production. Employment become equal to each other.

Q2. Is equilibrium level in economy is attain always at full employment.

Ans. No, economy is not a full employment level it can became equilibrium at under employment or overfull employment.

1. **FULL EMPLOYMENT:-** It refers to a situation when the aggregate demand equal to aggregate supply at full employment level.

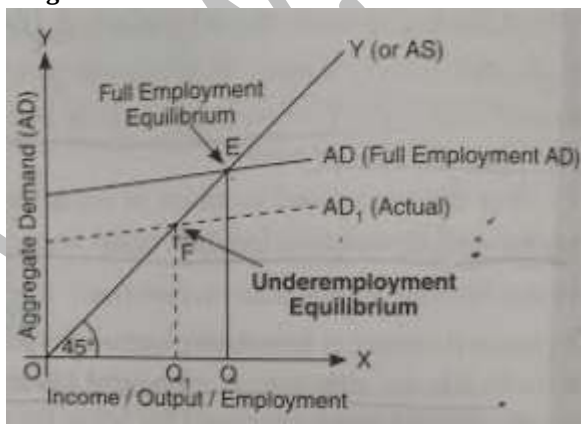
Diagram:



- E is the full employment equilibrium because aggregate demand is equal to full employment level of output OQ.
- As OQ level of output all those whoa are willing to work at the prevailing wages rate are able to find employment. There is no involuntary unemployment.

2. **UNDER EMPLOYMENT EQUILIBIRUM:-** It refers to a situation when the aggregate supply equal to AD. When resources are not fully employed.

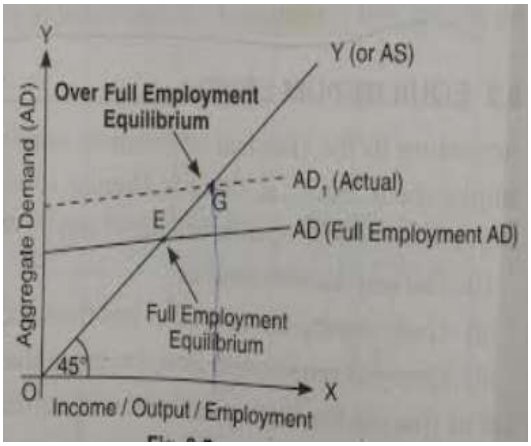
Diagram:



- AD = AS at point F which is lower than full employment level.
- OQ1 is less than OQ point F signifies under employment equilibrium.

3. **OVERFULL EMPLOYMENT EQUILIBRIUM:-** It refers to a situation when AD = AS beyond the full employment level. It occurs after the full employment level.

Diagram:



- AD1 = AS at point G which is higher than the full employment level.
- Point G signifies the overfull employment equilibrium.

Q3. Explain the concept of investment multiplier and its working.

Ans. Multiplier is the ratio of increase in national income due to increase in investment.

$K = \frac{\Delta Y}{\Delta I}$

For example suppose an additional investment of Rs. 4000 is an economy generate an additional income of Rs. 16,000 the value of K is 16000/4000 = 4

❖ **WORKING OF MULTIPLIER;-**

1) The working of multiplier is based on some assumptions.

2) One person's expenditure is another person's income.

3) When an additional investment is made than income increase many times more than the increase in investment.

a. Suppose an additional investment of Rs. 100 crore is made. This extra investment will generate an extra income of Rs. 100 crore in the first round.

b. If MPC is assumed to be 0.9 than recipient of this additional income will spent 90% of Rs. 100 crore an consumption and remaining amount by Rs. 90 crore in the second round.

c. In the next round 90% if the additional income of 90 crore i.e. 81 crore will be spent on consumption and the remaining amount will be saved.

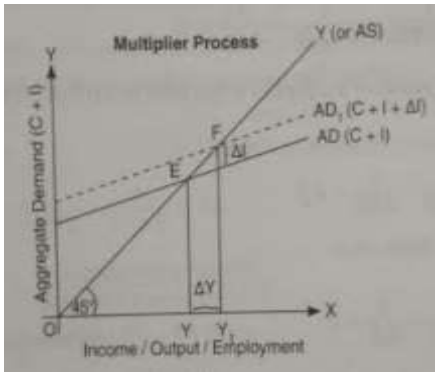
d. This multiplier purpose will go on the consumption expenditure in every round will be 0.9 times of the additional income received from the previous round.

Round	**Increase in investment**	**Increase in income**	**Increase in consumption**	**Increase in saving**
1	100	100	90	10
2		90	81	9
3		81	72.90	8.10
4		72.90	65.61	7.29
5		65.61		
Total	**100**	**1000**	**900**	**100**

Thus an initial investment of Rs. 100 crore leads a total increase of Rs. 100 crore in the income.

$K = \frac{\Delta Y}{\Delta I} = 1000/100 = 10$ Thus income increase from 10 times of investment.

Diagram:



- The initial equilibrium is determine at point E where AD intersect the As curve the equilibrium level of income is OY.
- Now, suppose the investment is increase by change in investment. So that new AD curve intersect the AS at point F. thus new equilibrium level of income is OY1.
- The income rises from OY to OY1.
- **PROOF:-** K = 1 /1-MPC when MPC -1 then K 1/1-1 = 1/0 = ∞
- **VALUE: -** The minimum value of multiplier is 1 when the value of MPC = 0 which indicates whole of the additional income is saved response to an initial increase in investment. Then incarese in income is greater than increase in investment.

Q4. Explain the allergic expression relation between MPC also with MPS.

Ans. Y = C + I

If there is any change in Y will also equal to Change in C.

ΔY = ΔC + ΔI Similarly divide both sides by

$$\Delta Y = \frac{\Delta Y}{\Delta Y} = \frac{\Delta C}{\Delta Y} + \frac{\Delta I}{\Delta Y}$$

1 = MPC + 1/K

K = 1/1-MPC

Multiplier in terms of MPS

K = 1/1-MPC

1-MPC = MPS

K = 1/MPS = 1

Multiplier is directly retained to MPC and inversely related to MPS.

Q5. What is the maximum and minimum value of multiplier.

Ans. The maximum value of multiplier is ∞ when the value of MPC is 1. MPC = 1 indicates that the economy decide to consume the whole of its additional income and not even a bit of additional income is saved.

Q1. Calculate multiplier if MPC is: (i) 0.75; (ii) 0.90.

Ans. 4, 10

Q2. Calculate the value of multiplier if the MPS is: (a) 0.40; (b) Equal to MPC

Ans. 2.5, 2

Q3. In an economy, income generated is four times the increase in investment expenditure. Calculate the values of MPC and MPS.

Ans. MPC = 0.75; MPS = 0.25

Q4. In an economy, the marginal propensity to consume is 0.8. If the investment increases by Rs. 1,000 crores, calculate the total increase in income.
Ans. Rs. 5,000 crores.

Q5. In an economy, 60% of increased income is spent on consumption. If Rs. 4 crores are invested in a project, find out the increase in income and saving.
Ans. Increase in income = Rs. 10 crores; Increase in saving = Rs. 4 crores.

Q6. In an economy, the actual level of income is Rs. 500 crores, whereas, the full employment level of income is Rs. 800 crores. If one-fourth of additional income is saved. Calculate increase in investment required to achieve full employment level of income.
Ans. Rs. 75 crores.

Q7. In an economy, the equilibrium level of income falls short by Rs. 500 crores. Calculate the additional investment needed to achieve the equilibrium level of income, if 80% of increased income is spent on consumption.
Ans. Rs. 100 crores.

Q8. In an economy, the equilibrium level of income is Rs. 12,000 crore. The ratio of marginal propensity to consume and marginal propensity to save is 3:1. Calculate the additional investment needed to reach a new equilibrium level of income of Rs. 20,000 crore.
Ans. Rs. 2,000 crores.

Q9. Calculate MPS and multiplier from the following data:

Income (Rs.)	100	200
Saving (Rs.)	40	100

Ans. MPS = 0.60; multiplier = 1.67

Q10. In an economy, marginal propensity to consume is 0.75. If investment expenditure is increased by Rs. 500 crores, calculate the total increase in income and consumption expenditure.
Ans. Total increase in income = Rs. 2,000 crores; Total increase in consumption expenditure = Rs. 1,500 crores.
Q11. An increase of Rs. 200 crore in investment leads to a rise in national income by Rs. 1000 crores. Find out marginal propensity to consume.
Ans. 0.80

Q12. As a result of increase in investment by Rs. 125 crores, national income increases by Rs. 500 crores. Calculate marginal propensity to consume.
Ans. 0.75

Q13. As a result of increase in investment, national income rises by Rs. 600 crores. If marginal propensity to consume is 0.75, calculate the increase in investment.
Ans. 150 crores.

Q14. If marginal propensity to consume is 0.9, what is the value of multiplier? How much investment is needed, if national increases by Rs. 5000 crores?
Ans. Multiplier = 10; increase in investment = Rs. 500 crores.

Q15. In an economy, the entire increase in income is spent on consumption. What will be the value of multiplier?
Ans. ∞

Q16. In an economy 75 percent of the increase in income is spent on consumption. Investment is increased by Rs. 1,000 crore. Calculate: (a) total increase in income; (b) total increase in consumption expenditure.
Ans. a. Rs. 4,000 crores; b. Rs. 3,000 crores.

Q17. An increase of Rs. 250 crores in investment in an economy resulted in total increase in income of Rs. 1,000 crores. Calculate the following: (a) Marginal propensity to consume (b) Change in saving (c) change in consumption expenditure (d) value of multiplier.
Ans. a. 0.75; b. Rs. 250 crores; c. Rs. 750 crores; d. 4

Q18. In an economy, income increases by 10,000 as a result of a rise in investment expenditure by 1,000. Calculate: a. investment multiplier; b. marginal propensity to consume.
Ans. a. 10; b. 0.9

Q19. In an economy, an increase in investment leads to increase in national income which is three times more than the increase in investment. Calculate marginal propensity to consume.
Ans. 0.75

Q20. In an economy, with every increase in income, 10 percent of the rise in income is saved. Suppose a fresh investment Rs. 120 crores takes place in the economy. Calculate the following: 1. Change in the income; 2. Change in consumption
Ans. 1. Rs. 1,200 crores; 2. Rs. 1,080 crores.
Q21. If an additional investment of Rs. 500 crores increases the income by Rs. 500 crores in the first round of the multiplier process, by Rs. 450 crores in the second round, by Rs. 405 crores in the third round and so on. Determine the total increase in income.
Ans. Rs. 5,000 crores.

Q22. Calculate saving, AD, AS and determine equilibrium level if investment is fixed at Rs. 100 crores.

Income (Rs. Crore)	0	100	200	300	400	500
Consumption (Rs. Crore)	50	100	150	200	250	300

Ans. Equilibrium level of income is Rs. 300 crores. At this level, AD = AS = Rs. 300 crores and saving = investment = Rs. 100 crores.

Q23. Suppose investment in the economy is fixed at Rs. 40 crores. The consumption expenditure at different level of income, is given in the following schedule:

Income (Rs. Crore)	200	300	400	500	600	700
Consumption (Rs. Crore)	220	300	380	460	540	620

Q24. Given consumption function C = 100 + 0.75Y (where C = consumption expenditure and Y = national income) and investment expenditure Rs. 1,000, calculate: (i) Equilibrium level of national income; (ii) Consumption expenditure at equilibrium level of national income.
Ans. 1. Rs. 4,400 ; 2. Rs. 3,400

Q25. In an economy, the consumption function is C = 500 + 0.75Y, where C is consumption expenditure and Y is income. Calculate the equilibrium level of income and consumption expenditure, when investment expenditure is 5,000.
Ans. Equilibrium level of income = 22,000; Consumption expenditure at equilibrium level of income = 17,000.

Q26. The saving function of an economy is S = -200 + 0.25Y. The economy is in equilibrium when income is equal to 2,000. Calculate (a) investment expenditure at equilibrium level of income; (b) Autonomous consumption ; (c) investment multiplier.
Ans. a. 300; b. 200; c. 4

Q27. If saving function for an economy is given as: S = -500+0.2Y and investment expenditure is Rs. 100 crores, then determine: (i) Level of income when saving will become zero; (ii) Level of income when saving is equal to investment.

Q28. The equilibrium level of income is an economy is Rs. 5,000 crores. The autonomous consumption expenditure is equal to Rs. 250 crores and investment expenditure Rs. 1,000 crores. Calculate: 1. Consumption expenditure at equilibrium level of national income; 2. Marginal propensity to save; 3. Saving function ; 4. Investment Multiplier; 5. Break even level of income.
Ans. 1. Rs. 4,000 crores, 2. 0.25; 3. -250+0.25 (Y) 4. 4, 5. 1,000 crores.
Q29. In an economy, the investment expenditure is Rs. 70 crores and consumption function is C = 60+0.80Y. (i) Determine the equilibrium level of income; (ii) Find the equilibrium income when planned investment expenditure is increased by Rs. 10 crores; (iii) Value of multiplier due to increase in investment expenditure.
Ans. 1. Rs. 650 crores; 2. Rs. 700 crores; 3. 5

Q30. The saving at different level of income are given in the following schedule:

Income (Rs. Crore)	0	200	400	600	800	1000
Saving (Rs. Crore)	-120	-60	0	60	120	180

On the basis of the given schedule, answer the following questions:

1. Calculate MPC at different level of income.
2. If investment is Rs. 120 crores, determine the equilibrium level of income.
3. Derive the consumption and saving function.
4. What is the break even level of income.

Q31. Find national income from the following:
Autonomous consumption = Rs. 100 crore
Marginal propensity to consume = 0.80
Investment = Rs. 50

Q32. "When MPC is equal to MPS, increase in income will be two times the increase in investment". Comment.
Q33. The saving function of an economy is given as: S = -40+0.40(Y). Calculate the total increase in income if investment expenditure increases by Rs 700 crores.
Q34. In a two sector economy, the saving function is given as: S=-10+0.2Y and investment function is expressed as: I=-3+0.1Y. calculate the equilibrium level of income?
Q35. The following table illustrates the multiplier process after making an additional investment of Rs. 1,000 crores. Calculate the missing values.

	Increase in income (Rs. Crore)	Change in consumption (Rs. Crores)	Change in saving (Rs. Crores)
First round	?	?	200
Second round	?	640	?
Third round	?	?	?
All other rounds	?	?	?
Total	?	?	?

Q36. Calculate the additional investment needed if the equilibrium level of income falls short by Rs. 1,000 crores. It is given that consumption function is given as: C = 120 + 0.80Y.
Q37. In a two sector economy, the income function is: Y = C + I and consumption function is given as: C = 40 + 0.75Y. If investment are Rs. 60 crores, calculate: (a) equilibrium level of income; (b) level of consumption at equilibrium; (c) saving at equilibrium.