

Concept of Cost Function

1. Give two examples of Variable Cost. (Delhi 2013)

Ans. Two examples of Variable Cost are as follows:

- (i) Cost of raw material.
- (ii) Wages of casual labour.

2. Give an example each of Fixed Cost and Variable Cost. (Delhi 2013)

Ans. Examples for Fixed Cost and Variable Cost are:

- (i) Fixed Cost Rent of the building.
- (ii) Variable Cost of raw material.

3. Define Marginal (Delhi 2013, 2010c, 2008, 2007, 2006; All India 2009, 2006)

Ans. Marginal Cost is 'additional cost' owing to the production of an additional unit of output.

Symbolically, $MC_{nth} = TC_n - TC_{n-1}$

4. Give two examples of Fixed Cost. (Delhi 2013; All India 2010)

Ans. Two examples of Fixed Cost are:

- (i) Expenditure on machine and plant.
- (ii) Wages and salaries of permanent staff.

5. What is the behaviour of Average Fixed Cost as output increases? (HOTS; Delhi 2012)

or

What is the behaviour of Average Fixed Cost as output is decreased? (HOTS; All India 2009)

or

How does Average Fixed Cost behave as output is increased? (Delhi 2008C)

Ans. Average Fixed Cost goes on diminishing as output increases, but never become zero.

6. What is the behaviour of Total Variable Cost as output increases? (All India 2012)

Ans. Total Variable Cost increases with increase in output.

7. Define Fixed Cost. (Delhi 2009, 2008 C, 2007, 2006; All India 2009, 2006)

Ans. Fixed Costs are the sum total of expenditure incurred by the producer on the purchase or hiring of fixed factors of production.



8. Why is Average Total Cost greater than Average Variable Cost? (All India 2009)

Ans. Average Total Cost (ATC) is greater than Average Variable Cost (AVC) because Average Total Cost is the sum of Average Fixed Cost (AFC) and Average Variable Cost.

9. What does cost mean in economics? (Delhi 2008, 2007)

Ans. Cost refers to the expenditure incurred by a producer on the factor as well as non-factor inputs for a given amount of output of a commodity

10. Define Variable Costs. (All India 2008; Delhi 2006)

Ans. Variable Costs are the costs incurred on hiring variable factors of production, these costs vary directly with the quantity of output produced. These are called prime cost also. Symbolically, $TVC = TC - TFC$

3 Marks Questions

11. State the relation between Total Cost and Marginal Cost. (Delhi 2014)

Ans. Relationship between Total Cost and Marginal Cost are:

- (i) When MC is diminishing, TC increases at a diminishing rate.
- (ii) When MC is rising, TC increases at an increasing rate.
- (iii) When MC is constant, TC increases at a constant rate.

12. What is the behaviour of Average Fixed Cost as output is increased? Why is it so? (Delhi 2014)

Ans. AFC falls, when output is increased. Since, the Total Fixed Cost remains the same with changes in output, therefore, AFC falls steadily with increase in output. AFC curve is downward sloping.



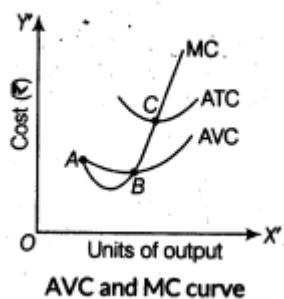
13. Complete the following table(Delhi 2013)

Output (units)	Average Cost (AC) (₹)	Marginal Cost (MC) (₹)
1	12	—
2	10	—
3	—	10
4	10.5	—
5	11	—
6	—	17

Ans.

Output (units)	Average Cost (AC) (₹)	Marginal Cost (MC) (₹)	Total Cost (TC) (₹)
1	12	—	12
2	10	8	20
3	10	10	30
4	10.5	12	42
5	11	13	55
6	12	17	72

14. Draw Average Variable Cost, Average Total Cost and Marginal Cost single diagram (Delhi 2012).



Ans.

15. An individual is both the owner and the manager of a shop taken on rent. Identify implicit cost and explicit cost from this information. Explain.(hots; Delhi 2012)

Ans. In the above example, rent is an explicit cost as it is paid by the owner and salary is the implicit cost as it is earned by manager while working in an organisation.

Implicit cost These are costs of self-owned and self-employed or self-supplied resources, e.g. rent of own land, interest on own capital, etc.

Explicit cost these are those cash payments, which firms make to outsider for their factor services, e.g. wages of labour, payment for raw material, rent, interest, etc.

16. A producer borrows money and opens a shop. The shop premises is owned by him. Identify implicit cost and explicit cost from this information. Explain, (hots; Delhi 2012)

Ans. In the above example, interest paid on borrowed money will be explicit cost whereas the imputed rent of the shop premises is implicit cost.

Implicit cost These are costs of self-owned and self-employed or self-supplied resources, e.g. rent of own land, interest on own capital, etc.

Explicit cost these are those cash payments, which firms make to outsider for their factor services, e.g. wages of labour, payment for raw material, rent, interest, etc.

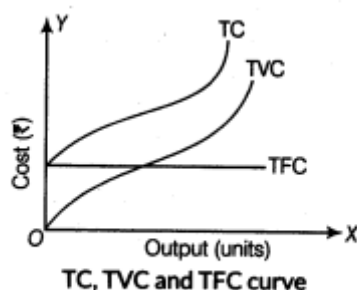
17. A producer invests his own savings in starting a business and employs a manager to look after it. Identify the implicit cost and explicit cost from this information. Explain. (HOTS; Delhi 2012)

Ans. In the above example, imputed values of the interest that a producer would have earned on his savings will be implicit cost and salary paid to the manager will be explicit cost.

Implicit cost These are costs of self-owned and self-employed or self supplied resources, e.g. rent of own land, interest on own capital, etc.

Explicit cost These are those cash payments, which firms make to outsider for their factor services, e.g. wages of labour, payment for raw material, rent, interest, etc.

18. Draw Total Variable Cost, Total Cost and Total Fixed Cost curves in a single diagram. (All India 2012)



Ans.



19. A producer starts a business by investing his own savings and hiring the labour. Identify implicit cost and explicit cost from this information. Explain.(HOTS; All India 2012)

Ans. In the above example, imputed value of the interest that a producer would have earned on his savings will be implicit cost and wages paid to the labour will be the explicit cost.

Implicit cost These are costs of self-owned and self-employed or self supplied resources, e.g. rent of own land, interest on own capital, etc.

Explicit cost These are those cash payments, which firms make to outsiders for their factor services, e.g. wages of labour, payment for raw material, rent, interest, etc.

20. A producer borrows money and starts a business. He himself looks after the business. Identify implicit cost and explicit cost from this information. Explain. (HOTS; All India 2012)

Ans. In the above example, interest paid on borrowed money will be explicit cost and income earned by him from his business is implicit cost.

Implicit cost These are costs of self-owned and self-employed or self-supplied resources, e.g. rent of own land, interest on own capital, etc.

Explicit cost These are those cash payments, which firms make to outsiders for their factor services, e.g. wages of labour, payment for raw material, rent, interest, etc.

21. Giving examples, explain the meaning of cost in economics. (Delhi 2011)

Ans. Cost refers to the expenditure incurred by a producer on the factor as well as non-factor inputs for production of a given amount of output of a commodity. It includes explicit cost (expenditure on the purchase of inputs from the market like wages paid to labours, interest paid on borrowed money, etc) and implicit cost (estimated expenditure on the use of self-supplied factors like rent of the building owned by the producer, wages and salary for producer's own labour, etc).

22. Distinguish between implicit and explicit costs and give examples. (All India 2011)

Ans. Difference between implicit cost and explicit cost

Basis	Implicit cost	Explicit Cost
Meaning	These are costs of self owned and self employed resources.	These are those cash payments which firms make to outsiders for their services and goods.
Example	Gaining rent by the employer on his own building.	Wages paid to labours.
Money	No actual money.	Actual money.
Payment	Payment is involved.	Payment is involved.

23. Given below is the cost schedule of a firm. Its Average Fixed Cost is 20 when it produces 3 units. (Delhi 2010)

Output (Q) (units)	1	2	3
Average Variable Cost (AVC) (₹)	30	28	32

Calculate its Marginal Cost and Average Total Cost at each given level of output.

Ans. When output = 3 units; AFC = ₹ 20

$$TFC = AFC \times Q$$

$$= 20 \times 3 = ₹ 60 \text{ [This remains same for all levels of output]}$$

$$\text{Marginal Cost} = TVC_n - TVC_{n-1}$$

$$ATC = AFC + AVC$$

(1)

Output (units)	Average Variable Cost (AVC) (₹)	Total Fixed Cost (TFC) (₹)	Average Fixed Cost (AFC) (₹)	Total Variable Cost (TVC) (₹)	Marginal Cost (MC) (₹)	Average Total Cost (ATC) (₹)
1	30	60	60	30	30	90
2	28	60	30	56	26	58
3	32	60	20	96	40	52

24. A firm's Average Fixed Cost, when it produces 2 units is ? 30. Its Average Total Cost schedule is given below. (All India 2010)



Output (units)	1	2	3
Average Total Cost (ATC) (₹)	80	48	40

Calculate its Marginal Cost and Average Variable Cost at each level of output.

Ans. $MC = TVC_n - TVC_{n-1}$, $AVC = TVC / Q$ or $AC - AFC$,

$TFC = AFC \times Q = 30 \times 2 = 60$, $TVC = TC - TFC$. (1)

Output	Average Total Cost (ATC)	Total Cost (TC)	Total Fixed Cost (TFC)	Total Variable Cost (TVC)	Average Variable Cost (AVC)	Marginal Cost (MC)	Average Fixed Cost (AFC)
1	80	80	60	20	20	20	60
2	48	96	60	36	18	16	30
3	40	120	60	60	20	24	20

25. Given below is the cost schedule of the firm. Its Total Fixed Cost is 120 (All India 2010)

Output (units)	1	2	3
Average Total Cost (ATC) (₹)	160	96	80

Calculate the Marginal Cost and Average Variable Cost at each level of output.

Ans. Marginal Cost = $TVC_n - TVC_{n-1}$, $AVC = TVC / Q$ (1)

Output (units)	Average Total Cost (ATC) (₹)	Total Fixed Cost (TFC) (₹)	Total Cost (TC) (₹)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
1	160	120	160	40	40	40
2	96	120	192	72	36	32
3	80	120	240	120	40	48

26. From the following cost schedule of a firm, calculate Marginal Cost and Average Variable Cost at each level of output. (All India 2010)

Output (units)	1	2	3
Total Cost (TC) (₹)	80	96	120
Average Fixed Cost (AFC) (₹)	60	30	20

Ans. Marginal Cost = $TVC_n - TVC_{n-1}$, $AVC = TVC / Q$ (1)

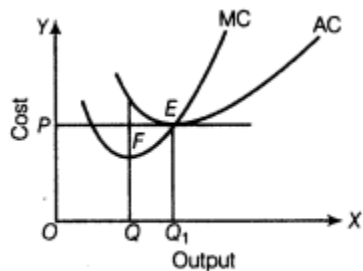
Output (units)	Total Cost (TC) (₹)	Average Fixed Cost (AFC) (₹)	Total Fixed Cost (TFC) (₹)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
1	80	60	60	20	20	20
2	96	30	60	36	18	16
3	120	20	60	60	20	24



27. Explain the relationship between Marginal Cost and Average Cost.(All India 2008;Delhi 2007)

Ans. Relationship between Marginal Cost and Average Cost is as follows:

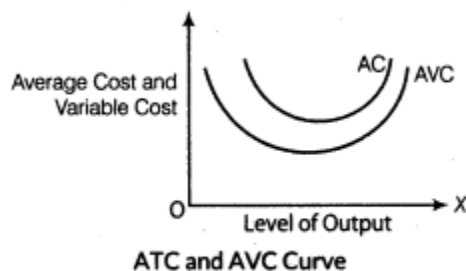
- (i) When AC falls, MC is lower than AC.
- (ii) When AC rises, MC is greater than AC.
- (iii) When AC is constant and minimum (as at point E), MC is equal to AC.
- (iv) MC's minimum point (At Q) lies to the left of AC's minimum point (At Q₁)



Relationship between MC and AC

28. Why does the difference between Average Total Cost and Average Variable Cost decrease with increase in the level of output? Explain.(Delhi 2008 C)

Ans. As we increase the level of output, the difference between ATC and AVC decreases because $ATC = AFC + AVC$ and Total Fixed Cost remain constant at all levels of output, but with rise in level of output, AFC decreases. That's why the difference between ATC and AVC decreases with rise in level of output.



ATC and AVC Curve

4 Mark Questions

29. Define Marginal Cost. Explain its relation with Average Cost(All India 2011; Delhi 2009c)

Ans. Marginal Cost is 'additional cost' owing to the production of an additional unit of output.

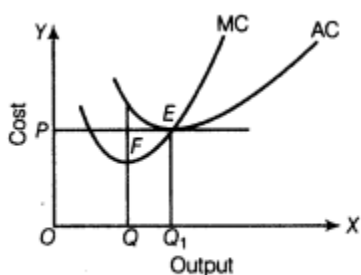
Symbolically,

$$MC_{nth} = TC_n - TC_{n-1}$$

Relationship between Marginal Cost and Average Cost

Relationship between Marginal Cost and Average Cost is as follows:

- (i) When AC falls, MC is lower than AC.
- (ii) When AC rises, MC is greater than AC.
- (iii) When AC is constant and minimum (as at point E), MC is equal to AC.
- (iv) MC's minimum point (At Q) lies to the left of AC's minimum point (At Q1)

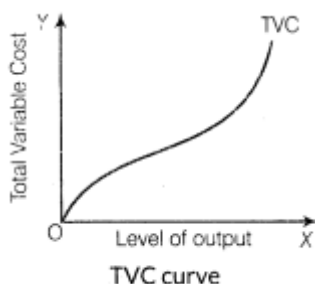


Relationship between MC and AC

30. Define Variable Cost. Explain the behaviour of Total Variable Cost as output increases. (All India 2011)

Ans. Variable Cost are the costs incurred on hiring variable factors of production, these costs vary directly with the quantity of output produced. These are called prime cost also. Symbolically, $TVC = TC - TFC$

Total Variable Cost increases with increase in output. Initially, it increases at decreasing rate, eventually it increases at an increasing rate. In other words, it increases at an increasing rate when diminishing returns to a factor starts operating.



TVC curve

31. Complete the following table.(Delhi 2009)

Output (units)	Average Variable Cost (AVC) (₹)	Total Cost (TC) (₹)	Marginal Cost (MC) (₹)
1	—	60	20
2	18	—	—
3	—	—	18
4	20	120	—
5	22	—	—

Ans. $AVC = TVC/Q$, $TC = TFC + TVC$

$TVC = AVC \times Q$, $MC = TVC_n - TVC_{n-1}$

Output (Q) (units)	Average Variable Cost (AVC) (₹)	Total Variable Cost (TVC)	Total Cost (TC) (₹)	Total Fixed Cost (TFC)	Marginal Cost (MC) (₹)
1	20	20	60	40	20
2	18	36	76	40	16
3	18	54	94	40	18
4	20	80	120	40	26
5	22	110	150	40	30

32. Complete the following table.(All India 2009)

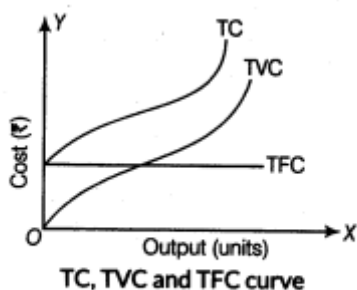
Output (units)	Total Cost (TC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
1	90	—	30
2	—	27	—
3	—	—	27
4	180	30	—

Ans. $AVC = TVC/Q$, $TC = TFC + TVC$

$TVC = AVC \times Q$, $MC = TVC_n - TVC_{n-1}$

Output (Q) (units)	Total Fixed Cost (TFC) (₹)	Total Cost (TC) (₹)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
1	60	90	30	30	30
2	60	114	54	27	24
3	60	141	81	27	27
4	60	180	120	30	39

33. Draw Total Fixed Cost, Total Variable Cost and Total Cost Curves in a single diagram. State the relation between Total Variable Cost and Total Cost curves. (All India 2009)



Ans.

Relations between Total Variable Cost and Total Cost curves are:

- (i) TC is the sum of TFC and TVC.
- (ii) TC always exceed TVC by the same amount of TFC.
- (iii) TVC and TC curves will run vertically parallel and vertical distance between the two is equal to TFC.
- (iv) Both TC and TVC are inverted 'S' shaped. While TFC is horizontal line.

34. Complete the following table.(Delhi 2008)

Output (units)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
1	10	—	—
—	—	8	6
3	27	—	—
—	—	10	13

Ans. $AVC = \frac{TVC}{Q}$, $Output = \frac{TVC}{AVC}$

$TVC = AVC \times Q$, $MC = TVC_n - TVC_{n-1}$

Output (Q) (units)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
1	10	10	10
2	16	8	6
3	27	9	11
4	40	10	13

35. Complete the following table.(Delhi 2008)

Output (units)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
1	—	12	—
2	20	—	—
—	—	10	10
4	40	—	—

Ans. $AVC = \frac{TVC}{Q}$, $Output = \frac{TVC}{AVC}$

$TVC = AVC \times Q$ or $MC = TVC_n - TVC_{n-1}$

Output (Q) (units)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
1	12	12	12
2	20	10	8
3	30	10	10
4	40	10	10

36. Distinguish between (i) Fixed Cost and Variable Cost giving examples (ii) Average Cost and Marginal Cost giving an example. (All India 2008)

Ans. (i) Difference between Fixed Cost and Variable cost

Basis	Fixed Cost	Variable Cost
Meaning	It is the cost of hiring fixed factors of production.	It is the cost of hiring variable factor of production.
Relation with output	It remains the same whether output is zero or maximum.	It is zero when output is zero. It increases with increase in output and decreases with decrease in output.
Example	Rent, licence fee, etc.	Cost of raw material, wages of casual labour, etc.

(ii) Difference between Average Cost and Marginal Cost

Average Cost It is the cost per unit of output.

Symbolically, $AC = \frac{TC}{Q}$ or $\frac{TFC + TVC}{Q}$

Marginal Cost It is additional cost owing to the production of an additional unit of output.

Symbolically, $MC_n = TC_n - TC_{n-1}$ (2 × 2 = 4)



37. Complete the following table. (All India 2008 c)

Output (units)	Average Fixed Cost (AFC) (₹)	Marginal Cost (MC) (₹)	Total Cost (TC) (₹)
1	—	—	—
2	—	10	82
3	20	8	—
4	—	—	99
5	12	10	—

Ans. $AVC = \frac{TVC}{Q}$, $Output = \frac{TVC}{AVC}$

$TVC = AVC \times Q$, $MC = TVC_n - TVC_{n-1}$

Output (Q) (units)	Average Fixed Cost (AFC) (₹)	Marginal Cost (MC) (₹)	Total Variable Cost (TVC)	Total Cost (TC) (₹)	Total Fixed Cost (TFC)
1	60	12	12	72	60
2	30	10	22	82	60
3	20	8	30	90	60
4	15	9	39	99	60
5	12	10	49	109	60

38. Complete the following table. (All India 2008)

Output (units)	Average Fixed Cost (AFC) (₹)	Marginal Cost (MC) (₹)	Total Cost (TC) (₹)
1	—	—	—
2	—	20	164
3	40	16	—
4	—	—	198
5	24	20	—

Ans. $AVC = \frac{TVC}{Q}$, $Output = \frac{TVC}{AVC}$

$TVC = AVC \times Q$, $MC = TVC_n - TVC_{n-1}$

Output (Q) (units)	Total Fixed Cost (TFC) (₹)	Average Fixed Cost (AFC) (₹)	Marginal Cost (MC) (₹)	Total Variable Cost (TVC) (₹)	Total Cost (TC) (₹)
1	120	120	24	24	144
2	120	60	20	44	164
3	120	40	16	60	180
4	120	30	18	78	198
5	120	24	20	98	218



39. Calculate Total Variable Cost and Total Cost from the following cost schedule of a firm whose Fixed Cost are 10. (Delhi 2007)

Output (units)	1	2	3	4
Marginal Cost (MC) (₹)	6	5	4	6

Ans. $TVC = \sum MC$ or $MC_1 + MC_2 + MC_3 + \dots + MC_n$

$$TC = TFC + TVC$$

Output (Q) (units)	Total Fixed Cost (TFC)	Marginal Cost (MC)	Total Variable Cost (TVC)	Total Cost (TC)
1	10	6	6	16
2	10	5	11	21
3	10	4	15	25
4	10	6	21	31

40. Calculate Total Variable Cost and Marginal Cost from the following cost schedule of a firm, whose Total Fixed Cost are 12 (All India 2007)

Output (units)	1	2	3	4
Total Cost (TC) (₹)	20	26	31	38

Ans. $TVC = TC - TFC$

$$MC = TVC_n - TVC_{n-1}$$

Output (Q) (units)	Total Cost (TC)	Total Fixed Cost (TFC)	Total Variable Cost (TVC)	Marginal Cost (MC)
1	20	12	8	8
2	26	12	14	6
3	31	12	19	5
4	38	12	26	7

41. Complete the following table. (All India 2006)

Price (₹ Per unit)	Output (Units)	Marginal Cost (MC) (₹)	Total Revenue (TR) (₹)	Total Cost (TC) (₹)
5	1	4	—	—
4	2	3	—	—
3	3	2	—	—
2	4	1	—	—

Ans. $TR = \text{Price} \times \text{Output}$

$$TC = MC_1 + MC_2 + MC_3 + \dots + MC_n \text{ or } \sum MC$$

Price (₹ per unit)	Output (Q) (units)	Marginal Cost (MC) (₹)	Total Revenue (TR) (₹)	Total Cost (TC) (₹)
5	1	4	5	4
4	2	3	8	7
3	3	2	9	9
2	4	1	8	10



6 Mark Questions

42. From the following information about a firm, find the firm's equilibrium output in terms of Marginal Cost and Marginal Revenue. Give reasons. Also, find profit at this output. (Delhi 2014)

Output (units)	Total Revenue (₹.)	Total Cost (₹)
1	7	8
2	14	15
3	21	21
4	28	28
5	35	36

Ans. $MR_{nth} = TR_n - TR_{n-1}$, $MC_{nth} = TC_n - TC_{n-1}$

Determination of Firms's Equilibrium

Output (Q) (units)	Total Revenue (₹)	Total Cost (₹)	Marginal Revenue (₹)	Marginal Cost (₹)	Profit (TR-TC)
1	7	8	7	8	-1
2	14	15	7	7	-1
3	21	21	7	6	0
4	28	28	7	7	0
5	35	36	7	8	-1

43. From the following information about a firm, find the firm's equilibrium output in terms of Marginal Cost and Marginal Revenue. Give reasons. Also find profit at this output. (All India 2014)

Output (units)	Total Revenue (₹)	Total Cost (₹)
1	6	7
2	12	13
3	18	17
4	24	23
5	30	31

Ans. $MR_n = TR_n - TR_{n-1}$, $MC_n = TC_n - TC_{n-1}$

Output (Q) (units)	Total Revenue (₹)	Total Cost (₹)	Marginal Revenue (₹)	Marginal Cost (₹)	Profits (TR-TC)
1	6	7	6	7	-1
2	12	13	6	6	-1
3	18	17	6	4	1
4	24	23	6	6	1
5	30	31	6	8	-1

According to the $MR = MC$ approach, the firm attains its equilibrium, where the following two necessary and sufficient conditions are fulfilled.

(i) $MR = MC$

(ii) MC must be rising after the equilibrium level of output.



Thus, by looking at the above table, we can say that the firm is in equilibrium at output equal to 4 units, because at 4th unit of output $MR = MC$ and MC increases after the 4th unit of output.

44. State giving reasons, whether the following statements are true or false.

(i) With increase in level of output, Average Fixed Cost goes on falling till reaches zero. (All India 2013)

(ii) Average Variable Cost falls even when Marginal Cost is rising. (Delhi 2010)

(iii) The difference between Total Cost and Total Variable Cost falls with increase in output. (Delhi 2010)

(iv) As soon as Marginal Cost starts rising, Average Variable Cost also starts rising. (All India 2010)

(v) Average Cost falls only when Marginal Cost falls. (All India 2009)

(vi) The difference between Average Total Cost and Average Variable Cost is constant. (All India 200?)

(vii) As output is increased, the difference between Average Total Cost and Average

Variable Cost falls and ultimately becomes zero. (All India 2009)

Ans. (i) False, because as output increases, Average Fixed Cost falls but can never be zero, Average Fixed Cost must remain positive even when it is falling, as TFC is always positive.

(ii) True, Average Variable Cost can fall even when Marginal Cost is rising, as MC cuts AVC at its minimum point.

(iii) False, because the difference between Total Cost and Total Variable Cost is equal to Total Fixed Cost which remains constant at all levels of output.

(iv) False, Average Variable Cost can fall even when Marginal Cost starts rising.

(v) False, Average Cost can fall even when Marginal Cost is rising as MC cuts AC at its minimum point.



(vi) False, the difference between Average Total Cost and Average Variable Cost is Average Fixed Cost which can never be constant. Since, AFC tends to decline with increase in output, the difference between ATC and AVC must reduce as output increases.

(vii) False, because as output increases, the difference between ATC and AVC falls but can never be zero. The difference is equal to AFC, which must remain positive, even when it is falling

45. Complete the following table. (Delhi 2011 c)

Output (units)	Total Cost (TC) (₹)	Average Fixed Cost (AFC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)
0	36	—	—	—
1	—	—	—	18
2	—	—	—	14
3	—	—	16	—
4	—	—	—	24

Ans. Total Cost = TFC + TVC

Total Variable Cost = AVC × Q

AVC = TVC/Q or AC – AFC

Marginal Cost = $TVC_n - TVC_{n-1}$

$AFC = \frac{TFC}{Q}$

TFC = First value of TC at zero level of output

(3)

Output (Q) (units)	Total Cost (TC) (₹)	Total Fixed Cost (TFC) (₹)	Average Fixed Cost (AFC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)	Total Variable Cost (TVC) (₹)
0	36	36	—	—	—	0
1	54	36	36	18	18	18
2	68	36	18	16	14	32
3	84	36	12	16	16	48
4	108	36	9	18	24	72

46. Complete the following table. (All India 2011)

Output (units)	Average Fixed Cost (AFC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)	Total Cost (TC) (₹)	Average Cost (AC) (₹)
1	—	—	18	—	—
2	36	16	14	—	—
3	24	—	—	120	—
4	18	18	—	—	—

Ans. Total Cost = TFC + TVC

Total Variable Cost = $AVC \times Q$

$AVC = TVC/Q$ or $AC - AFC$

Marginal Cost = $TVC_n - TVC_{n-1}$

$$AFC = \frac{TFC}{Q}$$

TFC = First value of TC at zero level of output

(3)

Output (Q) (units)	Total Fixed Cost (TFC) (₹)	Average Fixed Cost (AFC) (₹)	Average Variable Cost (AVC) (₹)	Marginal Cost (MC) (₹)	Total Cost (TC) (₹)	Average Cost (AC) (₹)	Total Variable Cost (TVC) (₹)
1	72	72	18	18	90	90	18
2	72	36	16	14	104	52	32
3	72	24	16	16	120	40	48
4	72	18	18	24	144	38	72

47. Complete the following table. (All India 2011C)

Output (units)	Marginal Cost (MC) (₹)	Average Variable Cost (AVC) (₹)	Average Fixed Cost (AFC) (₹)	Average Cost (AC) (₹)
1	—	—	—	140
2	—	45	—	—
3	45	—	30	—
4	—	48	22.5	—
5	—	52	18	—

Ans. Total Cost = TFC + TVC

Total Variable Cost = $AVC \times Q$

$AVC = TVC/Q$ or $AC - AFC$

Marginal Cost = $TVC_n - TVC_{n-1}$

$$AFC = \frac{TFC}{Q}$$

TFC = First value of TC at zero level of output

(3)

Output (Q) (units)	Marginal Cost (MC) (₹)	Average Variable Cost (AVC) (₹)	Average Fixed Cost (AFC) (₹)	Average Cost (AC) (₹)	Total Variable Cost (TVC) (₹)
1	50	50	90	140	50
2	40	45	45	90	90
3	45	45	30	75	135
4	57	48	22.5	70.5	192
5	68	52	18	70	260



48. The Total Fixed Cost of a firm is 12. Given below is its marginal cost schedule. Calculate Total Cost and Average Variable Cost for each given level of output (Delhi 2006)

Output (units)	1	2	3	4	5	6
Marginal Cost (MC) (₹)	9	7	2	4	8	12

Ans. Total Cost = TFC + TVC

Total Variable Cost = $AVC \times Q$

$AVC = TVC/Q$ or $AC - AFC$

Marginal Cost = $TVC_n - TVC_{n-1}$

$AFC = \frac{TFC}{Q}$

TFC = First value of TC at zero level of output

(3)

Output (Q)(units)	Total Fixed Cost (TFC) (₹)	Marginal Cost (MC) (₹)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Total Cost (TC) (₹)
1	12	9	9	9	21
2	12	7	16	8	28
3	12	2	18	6	30
4	12	4	22	5.5	34
5	12	8	30	6	42
6	12	12	42	7	54

49. Calculate Total Cost and Average Variable Cost of a firm at each given level of output from its cost schedule given below. (All India 2006)

Output (units)	1	2	3	4	5	6
Average Fixed Cost (AFC) (₹)	60	30	20	15	12	10
Marginal Cost (MC) (₹)	32	30	28	30	35	43

Ans.

Total Cost = TFC + TVC

Total Variable Cost = $AVC \times Q$

$AVC = TVC/Q$ or $AC - AFC$

Marginal Cost = $TVC_n - TVC_{n-1}$

$AFC = \frac{TFC}{Q}$

TFC = First value of TC at zero level of output

(3)

Output (Q) (units)	Average Fixed Cost (AFC) (₹)	Total Fixed Cost (TFC) (₹)	Marginal Cost (MC) (₹)	Total Variable Cost (TVC) (₹)	Average Variable Cost (AVC) (₹)	Total Cost (TC) (₹)
1	60	60	32	32	32	92
2	30	60	30	62	31	122
3	20	60	28	90	30	150
4	15	60	30	120	30	180
5	12	60	35	155	31	215
6	10	60	43	198	33	258

50. Explain the relation between Marginal Cost and Average Variable Cost with the help of diagram. (All India 2006)

Ans. Relations between Marginal Cost (MC) and Average Variable Cost (AVC) are as follows;

- (i) MC and AVC starts from same point A.
- (ii) AVC falls when MC remains below it. Hence, $MC < AVC$ in this range of output (before point B in the figure)
- (iii) When MC comes equal to AVC, the AVC becomes constant and this happens at its minimum point of AVC where MC curve cuts it from below Hence, $MC = AVC$ (at point B),
- (iv) In the range between L and K level of output, MC is rising but AVC diminishes.
- (v) AVC starts rising when MC becomes higher than AVC. Hence, $MC > AVC$ in this range of output (after point B).
- (vi) Minimum of MC curve (at B) lies to the left of minimum point of AVC curve (at K)

