18
COST

18.1 INTRODUCTION

You have already learned some of the important concepts used in micro economics. In lesson No. 15, you have studied the relationship between price and quantity demanded of a commodity per unit of time. In lesson No. 16 you have learnt the relationship between price and quantity supplied of a commodity per unit of time. In lesson No. 17 you noted that the equilibrium price of a commodity is determined at that level at which the market demand for the commodity equals market supply of it.

In this lesson you will learn about the various elements of 'cost' used in micro economics.

18.2 OBJECTIVES

After going through this lesson you will be able to :

- distinguish between the meaning of cost as used in business and as used in micro economics;
- explain the meaning and importance of various concepts of cost such as, paid out cost, imputed cost and normal profit in micro economics;
- distinguish between fixed costs and variable costs and explain the concepts of total costs, average cost and marginal cost;
- find out total cost from marginal cost and average cost and explain the importance of these costs for a producer;
- find out total fixed cost, total variable cost, average fixed cost, average variable cost, total average cost and marginal cost.

18.3 ELEMENTS OF COST

To begin with let us try to understand the concept of cost as used in business. We know that all production involves cost. To produce any commodity a producer or a firm requires inputs.

Take the example of the owner of a farm. For farming he requires a piece of land, agricultural workers, tools and implements, tractor, harvestor, water, seeds, manures, power, and so many other things.

A producer has to either incur expenditure on procuring various inputs or he provides these himself. For example, a farmer may have his own land or may hire land on rent. He may have his own tractor or may hire one. He may grow seeds on his own farm and use them for farming or he may purchase seeds from the market. The inputs are partly purchased and partly self-provided. Thus, the owner of a farm, or for that matter, any other producer, may provide some inputs himself and purchase or hire others from the market. Let us term the inputs which are directly purchased from the market as purchased inputs. Let us also term the inputs provided by the owner as self-provided inputs.

(a) Paid Out or Money Costs :

A firm purchases the services of assets like building, material/machine etc. It pays hiring charges for building, normally termed as rent. It employs workers, accountant, manager etc. and pays wages and salaries to them. It borrows money and pays interest on it. It purchases raw material, pays electricity bills and makes such other payments. All such actual payments, on purchasing and hiring different goods and services used in production are called **'paid out costs'** or **'explicit costs'.**

Normally in business, the accountant takes into account only the actual money expenditure as cost. So in business the cost is normally the **'paid out cost'** only.

(b) Cost of Self-Provided Inputs :

Many a times we find that all inputs are not always bought or hired by the producer from the market. Some of the inputs are provided by the entrepreneur himself. He may use his own building. He may invest his own money in the business. He may be the manager of his own firm. A farmer may cultivate his own land. Now if a producer had rented out his building to another production unit he would have earned rent. In the same way, if he had invested his money in some other business, it would have earned him a certain amount of interest or dividend. Similarly if he had worked for another factory as a manager he would have earned a salary. He is not able to receive these rewards (rent for his building, interest on his money and salary for his services) because he has contributed them for his own business. But he must be compensated for the use of these self-owned and self-employed inputs. By employing these inputs in his own business he has missed the opportunity of earning income on these by using them elsewhere. It is, therefore, a cost to the producer. We can make an estimate of these costs on the basis of their prevailing market prices. Let us term such costs as **'imputed costs'** (to distinguish them from paid out cost). One example of such cost is the imputed rent of the self owned factory building. It can be taken as equivalent to the actual rent paid for a similar type of building. Similarly we can find out imputed interest and imputed wages.

In micro economics, in addition to the paid out cost, imputed cost is also included in the cost of production. This is not all. There is yet another element of cost described as **'normal profit'.**

(c) Normal Profit as an Element of Cost :

Another component of cost is **'normal profit'.** Normal profit is an additional amount over the monetary and imputed cost that must be received by an entrepreneur to induce him to produce the given product. Normal profit is entrepreneur's opportunity cost and therefore enters into cost of production. Opportunity cost is the value of the opportunity or alternative that is sacrificed. You may be wondering how is it that profit is an element of cost? We will try to convince you.

For that let us first understand the meaning of the term **'normal profit'.** It is nothing but the minimum assured profit in the next best occupation. Normal profit is the reward which an entrepreneur must receive for the risk and uncertainties he bears in the production of a commodity. It can be understood with an example. Suppose there is a publisher who has the option of publishing commerce books or science books. He chooses to publish commerce books because he gets higher return from these. Now suppose that the market for science books is more assured but profit is lower. This would mean that the publisher who is publishing commerce books is sacrificing an assured return on science books is taking a risk. He would be prepared to face the risk only when he thinks that he would be able to get at least the same profit which he would have in any way got from science books. Loss of assured return on science books is then an element of cost for the publisher who is publishing commerce books instead of science books. It is termed as **'normal profit'** because it is an estimate of the minimum expectations of a producer from a business. So long as he gets this minimum he will continue to publish commerce books. If, at any stage, he does not get this amount, he will shift to the publication of science books. So in order that a producer continues to produce a commodity he must get normal profit in addition to recovering, his **'paid out cost'** and **'imputed cost'.** We hope you are now convinced that minimum expectation of a producer from a business is also an element of cost.

There are three elements of the total cost of production in micro economics :

(a) Paid out costs;
(b) Imputed costs; and
(c) Normal profits.

In business accounts only paid out costs are treated as cost.

Let us consider an example of the total cost elements for a farmer. He requires following inputs to produce (rice) : a piece of land; agricultural workers; tools and implements; tractor and harvestor; water, seeds, manures, power, and so many other things. He will either provide these inputs himself or he will purchase them from the market. Suppose, some of these inputs he provides himself and some of these he purchases from the market (see the following chart).

CHART SHOWING THE COST ELEMENTS FOR A FARMER

Total Cost of Produce (Rice)

Paid out or money cost +	**Cost of self provided inputs or imputed cost +**	**Normal profit**
1. Fertilizers	1. His own land	It is the minimum remuneration which must be earned by the farmer in order to induce him to produce this crop instead of switching over to the production of any other crop.
2. Insecticides	2. His own well, the water of which he uses for irrigation	
3. Wages for agricultural workers who are employed for sowing and harvesting	3. His own seeds saved from last crops	
4. Rent for tractor and harvestor	4. His and his family members' labour	
5. Payments for a premium of crop insurance		
6. Payments of taxes to Govt.		
7. Payments of electricity used for pump set, tube well etc.		

POINTS TO REMEMBER

- Production involves cost.
- Money costs or paid out costs are not the only costs in micro economics.
- The concept of cost as used in business generally refers to money or paid out cost.
- Cost in micro economics includes paid out cost, imputed cost and normal profit.

INTEXT QUESTIONS 18.1

1. Fill in the blanks using appropriate word from the choices given in brackets :

(i) Paid out cost is _____ (explicit cost, implicit cost).

(ii) Cost as used in business refers to _____ (imputed cost, money cost).
(iii) Imputed cost is compensation for _____ (hired factors, self-owned and self-employed inputs).
(iv) Cost in micro economics includes _____ (money cost only, imputed cost only, both money cost and imputed cost).
(v) Normal profit _____ a part of cost of production in micro economics (is, is not).

2. Some of the cost elements of a publisher are given below. Allocate them into money cost and imputed cost: (i) his own labour (ii) expenditure on papers, ink, electricity etc. (iii) expenditure on printing machine (iv) insurance premium (v) payments of wages and salaries to workers (vi) his own building where he prints the books and (vii) expenditure on transport to bring raw material like papers, ink etc.

18.4 FIXED COST AND VARIABLE COST

(a) Concept of Fixed Cost :

We have learnt in the last section the various elements of the cost of production of a commodity. All these elements of cost taken together are reclassified into 'fixed costs' and 'variable costs' in micro economics.

Expenditure which remains fixed irrespective of the quantity of output produced is classified as fixed cost. It is incurred whether the output is large or small or even when it is zero. It does not change when quantity of output is increased or decreased. For example, a firm producing pens must have a building, machinery and equipment, a manager, a watchman, etc. whether it is producing smaller or larger quantity of pens. Suppose that the factory is not functioning for some period of time due to some reason. It means that no output is produced during that period. But still rent will have to be paid for that period, wages of permanent employees of the factory will have to be paid. Thus, it is seen that there are some unavoidable costs which remain fixed. Examples of fixed costs are rent on factory building, interest on money borrowed, property taxes and salaries of permanent employees like manager, watchman etc. All these costs remain the same whether the output is small or large or zero. Fixed costs are also called 'overhead costs'. Thus fixed costs are costs that do not vary with changes in the level of output. They remain fixed whatever may be the level of output.

(b) Concept of Variable Costs :

Costs which change with every change in output are called variable costs. Examples of variable costs are cost on raw materials used in production, casual labour employed, power consumed in production etc. These costs are incurred only when actual production takes place. When output is increased, expenditure on raw material and labour also increases. For example, the firm producing pens will need more raw material, more labour etc. if it wants

to produce more pen. But if the firm were to reduce the production, less will have to be spent on these items. In case production is completely stopped, no expenditure need be incurred on these items. This would mean that there are no variable costs at zero output. These costs are avoidable in the period during which the production is avoided due to one reason or the other. These costs are incurred when actual production starts. These costs rise along with the increase in production. Thus variable costs are costs that directly vary with the changes in the level of output.

(c) Illustration :

The concepts of fixed cost and variable cost can be understood better with the help of a schedule and an illustration. Suppose a firm producing pens incurs the following costs at different levels of output (as given in table 18.1). You will see that its fixed cost remains constant whereas variable cost changes with every change in output. In this schedule, the fixed cost is Rs. 60 and remains the same at all levels of output. The variable cost is Rs. 60 when the producer is producing 100 pens. It rises to Rs. 100 when he produces 200 pens and to Rs. 150 at 300 pens and so on.

Table 18.1

Cost Schedule of a Firm

No. of pens in units (1 unit= 100 pens)	Total fixed cost (Rs.)	Total variable cost (Rs.)
0	60	0
1	60	60
2	60	100
3	60	150
4	60	260
5	60	390

POINTS TO REMEMBER

- Cost is classified into fixed cost and variable cost.
- Fixed costs do not change with a change in output.
- Variable costs change with every change in output.

INTEXT QUESTIONS 18.2

State whether the following statements are true or false :

(i) With increase in the quantity of output fixed costs increase.
(ii) There are no variable costs at zero output.

(iii) Expenses incurred on watchmen and property tax are fixed cost.
(iv) Variable costs change with every change in output.
(v) Cost incurred on all the labour is variable.

18.5 TOTAL COST

Total cost of a given volume of output is the sum of the monetary payments, imputed cost and normal profit. In the previous section we have learnt that production costs are classified into fixed cost and variable cost.

These two costs together make total cost.

$$TC = TFC + TVC$$

Where TC stands for total cost, TFC for total fixed cost and TVC for total variable cost.

When a production unit is established but there is no production, total cost is the same as the total fixed cost. As production takes place, variable cost is also incurred and so total cost changes. Total cost increases as the quantity of output rises. The change in total cost equals the change in total variable cost. This is because total fixed cost remains constant at all quantities of output. Change in total cost is due to changes in variable cost only. The calculation of total cost can be explained through the following example :

Table 18.2
Cost Schedule of a Pen Producer

No. of pens in units (one unit= 100 pens)	TFC Rs.	TVC Rs.	TC (TFC+TVC) Rs.
0	60	0	60
1	60	60	120
2	60	100	160
3	60	150	210
4	60	260	320
5	60	390	450

The table 18.2 shows that total fixed cost is Rs. 60 and remains the same at all quantities of output. The variable cost equals Rs. 60 when one unit is produced, increases to Rs. 100 at 2 units and to Rs. 150 at 3 units and so on. As the total cost is the sum of total fixed cost and total variable cost, it can be obtained by adding them at various quantities of output. For example, when one unit is produced total cost is Rs. 120 (Rs. 60+Rs. 60) and when two units are produced, it works out to be Rs. 160 (Rs. 60+Rs.100). Thus, we find that total cost varies directly with the level of output.

POINTS TO REMEMBER

- Total cost is the sum of total fixed cost and total variable cost.
- Total cost changes with a change in output.
- Changes in total cost are due to changes in variable cost only.

INTEXT QUESTIONS 18.3

Fill in the blanks with appropriate words given in the brackets :

(i) Changes in total cost when output varies are due to changes in _____ (fixed cost, variable cost).

(ii) To find total cost we have to _____ total fixed cost and total variable cost (add, multiply).

(iii) Total cost _____ zero at zero output (is, is not).

(iv) When output is zero total cost equals _____ (fixed cost, variable cost).

18.6 AVERAGE COST

In this section, we will discuss the concepts of average fixed cost (AFC), average variable cost (AVC) and average total cost (ATC). We make the following schedule showing various calculations of these costs:

Table 18.3
Cost Schedule of a Pen Producer

Output of pens(1unit = 100 pens)	TFC Rs.	TVC Rs.	TC (TFC+TVC) Rs.	AFC Rs.	AVC Rs.	ATC (AFC+AVC) Rs.
0	60	0	60	-	-	-
1	60	60	120	60	60	120
2	60	100	160	30	50	80
3	60	150	210	20	50	70
4	60	260	320	15	65	80
5	60	390	450	12	78	90

(a) Average Fixed Cost (AFC) :

Average fixed cost is obtained by dividing total fixed cost by the number of units of output produced :

$$AFC = \frac{TFC}{\text{Units of output}}$$

Fixed cost by definition remains fixed whatever is the output. Therefore, as production expands, the total fixed cost is distributed over a larger numbers of units. As a result, average fixed cost falls with every increase in output. For example, the total fixed cost of our producer is Rs. 60 when he produces one unit. Average fixed cost is Rs. 60 (Rs.60÷1). But if the production is increased to 2 units, average fixed cost is Rs. 30 (Rs.60÷2). When it produces 3 units it is Rs. 20 (Rs.60÷3). Therefore, the larger the output the lower will be the average fixed cost.

(b) Average Variable Cost (AVC) :

Average variable cost is obtained by dividing the total variable cost by the units of output produced.

$$AVC = \frac{TVC}{\text{Units of output}}$$

When output of pen is one unit TVC is Rs. 60, so AVC will be Rs. 60 (Rs. 60÷1). TVC at 2 units of pens is Rs. 100. So AVC at 2 units of output of pen is Rs. 50 (Rs. 100÷2) and so on.

(c) Average Total Cost (ATC) :

ATC is obtained by dividing the Total Cost (TC) by the total units of output :

$$ATC = \frac{TC}{\text{Units of output}}$$

The total cost of producing one unit of pen is Rs. 120. Therefore, ATC is Rs. 120 (Rs.120÷1). Total cost of 2 units of output is Rs. 160. So ATC is Rs. 80 (Rs.160÷2). As total cost is the sum of TFC and TVC, average total cost is the sum of AFC and AVC. So we can also find out ATC by adding AFC and AVC :

$$ATC = AFC + AVC$$

Check up from the schedule that ATC can also be calculated in this manner.

POINTS TO REMEMBER

- Average cost can be obtained by dividing total cost by quantity of output produced.
- Average fixed cost equals total fixed cost divided by quantity of output.
- Average variable cost can be obtained by dividing total variable cost by quantity of output.
- Sum of average fixed cost and average variable cost is average total cost.

INTEXT QUESTIONS 18.4

Fill in the blanks with appropriate words given in the brackets :

(i) Average cost is _____ (cost per unit, cost incurred on additional unit).
(ii) To find total cost we have to _____ average cost by quantity of output (multiply, divide).
(iii) Average fixed cost _____ with the increase in output (falls, rises).
(iv) Average total cost is the sum of _____ and _____ (average fixed cost, average variable cost, variable cost, fixed cost).

18.7 MARGINAL COST

The concept of marginal cost is a very important concept in micro economics. The importance of this concept will be more clear to you when you read lesson No. 20 on 'Maximisation of Profits'. The word marginal should be taken to mean additional. For example, marginal cost is the additional cost. Similarly, as you will see in the next lesson marginal revenue is the additional revenue. So whenever the word marginal comes, it means additional. Marginal cost of producing a level of output is the addition to the total cost caused by producing an extra unit of output. To explain how it is calculated, look at the following schedule

Table 18.4

Output of pens (1 unit=100 pens)	Total cost (Rs.)	Marginal cost(Rs.)
0	60	-
1	120	60
2	160	40
3	210	50
4	320	110
5	450	130

When output level is zero total cost is Rs. 60. As one unit of pens is produced by the producer the total cost rises to Rs. 120. So the marginal cost of producing one unit of output is Rs. 60 (Rs. 120-Rs. 60), when it produces 2 units his total cost increases to Rs. 160, the marginal cost at 2 units of output is Rs. 40 (Rs. 160-Rs.120). This has been calculated by deducting total cost of 1 unit from total cost of 2 units. Marginal cost at one unit of output is Rs. 60. This we got by deducting total cost of zero unit from total cost of one unit.

Alternatively, we can say that MC at any level of output is the cost of the last unit of output. For example, take the output level of 3 units of pens. In this case 3rd unit of pen is the last unit. Total cost of first 2 units of pens is Rs. 160. Total cost for adding one more unit of output increases to Rs. 210. The additional cost on last unit is Rs. 50 (Rs. 210-Rs. 160). So MC at 3 units of output is Rs. 50.

It should be kept in mind that marginal cost is dependent on the variable cost only. It is not affected by fixed cost because fixed cost remains constant. As output expands changes in

total cost are due to changes in variable cost only. So, marginal cost can also be calculated if only total variable costs are known to us. For example, take the following schedule showing TFC, TVC and TC. When we calculate MC from either TC or TVC we get the same result. Calculate yourself and the check the result.

Table 18.5

Output of pens (1 unit = 100 pens)	Total cost (Rs.)	TFC (Rs.)	TVC (Rs.)	MC (Rs.)
0	60	60	-	-
1	120	60	60	60
2	160	60	100	40
3	210	60	150	50
4	320	60	260	110
5	450	60	390	130

POINTS TO REMEMBER

- Marginal cost of producing output is the additional cost incurred on producing the last unit of output.
- Marginal cost of producing output also equals the additional variable cost incurred on producing the last unit of output.
- Marginal cost of a given unit of output equals the total cost upto the given unit less the total cost upto the previous unit of output.

INTEXT QUESTIONS 18.5

Fill in the blanks :

(i) Marginal cost is the ..... cost incurred on additional unit of output.

(ii) Marginal cost equals the change in total cost or the change in ..... per unit change in output.

(iii) Costs increase from 3 units to 4 units. As a result TC rises from Rs. 19.60 to Rs. 24.50. MC is .....

GLOSSARY

Money cost : Expenditure incurred on buying and hiring of factors of production for producing a given output.

Imputed cost : Compensation for the use of self-owned and self-employed resources.

Fixed cost	:	Cost which remains constant at all levels of output.
Variable cost	:	Cost which changes with every change in output.
Total cost	:	Sum of total fixed cost and total variable cost.
Marginal cost	:	Additional cost incurred on additional unit of output.
Average cost	:	Cost per unit of output.
Average fixed cost	:	Fixed cost per unit of output.
Normal profit	:	Minimum expectation of a firm in producing a commodity.

TERMINAL EXERCISE

1. What is 'imputed cost'? How is it different from paid out costs ?
2. What is paid out cost ? Distinguish it from imputed cost.
3. Explain the concept of 'normal profit'. Justify that it is an element of cost in micro economics.
4. Explain the various elements of cost in micro economics.
5. Differentiate between the concepts of cost as used in business and in micro economics.
6. Distinguish between fixed costs and variable cost with suitable examples.
7. Explain the relationship between output and average fixed cost.
8. Distinguish between AFC and AVC and describe how these are calculated.
9. Explain the term 'marginal cost'. Show with the help of an example how is it calculated.
10. Which cost, fixed or variable, determines marginal cost? Give reasons.
11. Classify the following expenditure into paid-out costs and imputed costs :
    a) A farmer growing seeds and using for cultivation
    b) Use of chemical fertilizers by a farmer
    c) Use of the services of a tractor owned by the farmer
    d) Farming by the farmer who owns the land
    e) Unpaid family labour used on farms
    f) Transport charges
    g) Interest on borrowings
    h) Wages paid
    i) Use of own building for production
    j) Excise duty.
12. Classify the following expenditure into fixed cost and variable cost :
    a) Rent of the factory building
    b) Wages to watchman
    c) Annual licensing fee of factory premises
    d) Raw material
    e) Rent of the agricultural land
    f) Seeds
    g) Fertilizers
    h) Interest on borrowings
    i) Excise duty
    j) Transport charges.

13. Calculate total cost, average total cost, average fixed cost, average variable cost and marginal cost, on the basis of the following information :

Output (units)	TFC	TVC
0	60	0
1	60	50
2	60	90
3	60	180
4	60	300

14. Calculate (i) TFC and TVC
(ii) AFC and AVC
(iii) MC

from the following data :

Output (units)	TC
0	180
1	300
2	400
3	510
4	720
5	1000

15. Suppose that TFC is Rs. 120, find out

(i) TC and TVC
(ii) MC

from the following data :

Output (units)	ATC (Rs.)
1	240
2	160
3	140
4	160
5	180

16. Fill in the blanks :

Output (units)	TC	TFC	TVC	MC
0	12	-	-	-
1	20	-	-	-
2	24	-	-	-
3	30	-	-	-
4	44	-	-	-

17. Complete the following table :

Output (units)	Total fixed cost	Total cost	ATC	Marginal cost	AFC
0	8			–	8
1				12	
2				10	
3				8	
4				6	
5				5	

EXTENDED LEARNING

After going through the various sections of this lesson you must have become familiar with the meaning of cost as used in micro economics and various concepts connected with it. In lesson No. 14 you have learnt about diagrams, let us convert some of the examples regarding cost into diagrams and see how they look.

Let us draw the diagram on the basis of the following data :

Output of commodity (units)	TFC Rs.	TVC Rs.	TC Rs.	AFC Rs.	AVC Rs.	ATC Rs.	MC Rs.
0	60	0	60	-	-	-	-
1	60	60	120	60	60	120	60
2	60	100	160	30	50	80	40
3	60	150	210	20	50	70	50
4	60	260	320	15	65	80	110
5	60	390	450	12	78	90	130

(a) TC, TVC And TFC curves

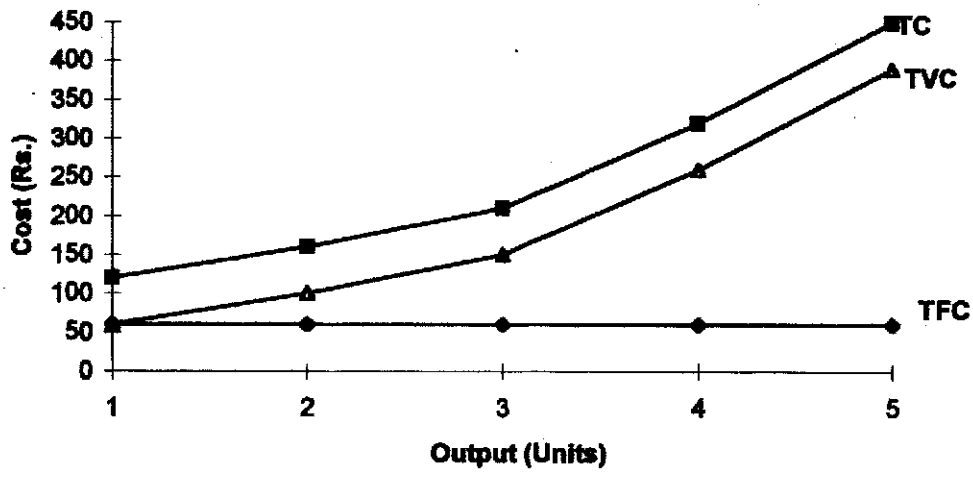

Fig. 18.1 : TC, TVC & TFC Curves

We observe the following in the above curves :

(1) TFC curve is parallel to the X-axis because TFC is constant at all levels of output.

(2) TVC and TC curves are continuously sloping upwards to the right because these costs are always increased when output level is increased.

(3) TC curve always lies above TVC curve because TC is always higher than TVC at all levels of output.

(4) The distance between TC and TVC is always the same because TC-TVC=TFC and TFC is always the same at all levels of output.

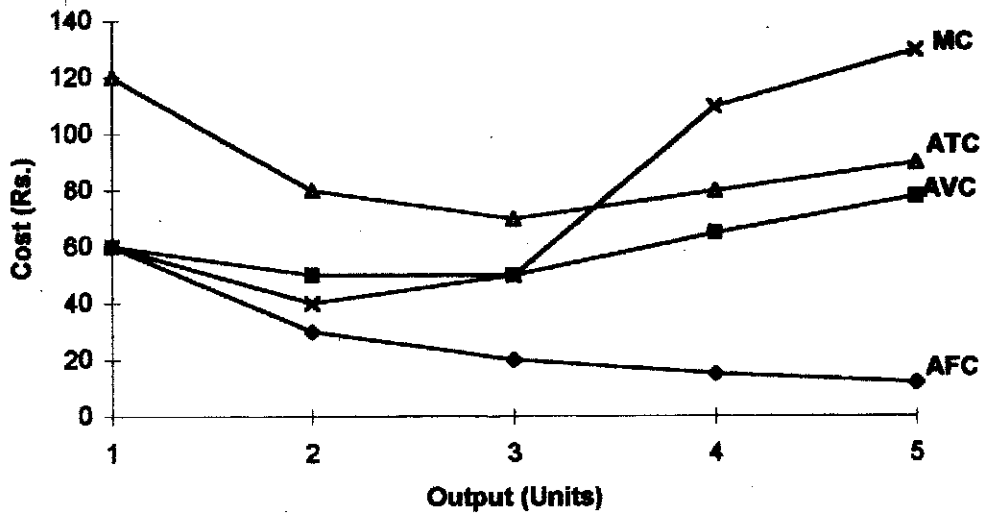

Fig. 18.2 : MC, ATC, AVC & AFC Curves

We observe the following in the above diagram :

(1) AFC is continuously sloping downwards to the right because AFC continuously falls as output expands.

(2) ATC, AVC and MC curves first slope downwards and then upwards. In micro economics such a shape is described as U-shape. It is because it is generally believed that these costs in the beginning fall as output expands and rise beyond a point.

ANSWERS

Intext Questions 18.1

1. (i) explicit cost (ii) money cost (iii) self-owned and self-employed inputs (iv) both money cost and imputed cost (v) is.

2. Money cost : (ii) (iii) (iv) (v) and (vii)
   Imputed cost : (i) and (vi)

Intext Questions 18.2

(i) False (ii) True (iii) True (iv) True (v) False

Intext Questions 18.3

(i) variable cost (ii) add (iii) is not (iv) fixed cost

Intext Questions 18.4

(i) cost per unit (ii) multiply (iii) falls (iv) average fixed cost, average variable cost.

Intext Questions 18.5

(i) additional (ii) Total variable cost (iii) Rs. 4.90

Terminal Exercise

1. Read section 18.3 (b)
2. Read section 18.3 (a)
3. Read section 18.3 (c)
4. Read section 18.3
5. Read section 18.3
6. Read section 18.4
7. Read section 18.6 (a)
8. Read section 18.6 (a,b)
9. Read section 18.7
10. Read section 18.7
11. Paid out costs : b,f,g,h,j
    Imputed costs : a,c,d,e,f
12. Fixed cost:a,b,c,e,h
    Variable cost:d,f,g,i,j

13.

Total Cost (Rs.) TFC+TVC	AFC	AVC	ATC	MC
60	-	-	-	-
110	60	50	110	50
150	30	45	75	40
240	20	60	80	90
360	15	75	90	120

14.

Output (units)	TC Rs.	TFC Rs.	TVC Rs.	AFC Rs.	AVC Rs.	MC Rs.
0	180	180	0	-	-	-
1	300	180	120	180	120	120
2	400	180	220	90	110	100
3	510	180	330	60	110	110
4	720	180	540	45	135	210
5	1000	180	820	36	164	280

15.

Output (units)	ATC	TC	TFC	TVC	MC
1	240	240	120	120	120
2	160	320	120	200	80
3	140	420	120	300	100
4	160	640	120	520	220
5	180	900	120	780	260

16.

Output (units)	TC Rs.	TFC Rs.	TVC Rs.	MC Rs.
0	12	12	0	-
1	20	12	8	8
2	24	12	12	4
3	30	12	18	6
4	44	12	32	14

17.

Output (units)	Total fixed cost	Total cost	Marginal cost	ATC	AFC
0	8	8	-	-	-
1	8	20	12	20	8
2	8	30	10	15	4
3	8	38	8	12.66	2.66
4	8	44	6	11.00	2.00
5	8	49	5	9.80	1.60