Chapter 3: Theory of Production & Cost

Unit - 2: (Theory of Cost)

**STEP –1**: Different types of Cost:-

1. **Accounting Cost .or. Explicit cost or Money cost:**
   When an entrepreneur undertakes an act of production he has to pay prices for the factors which he employs for production. These expenses include the money expenditure of a firm on wages and salaries paid to labour, payments incurred on machinery and equipments, payment of interest on borrowings, rental payments, payments for materials, power etc. Accounting books of the firm record these actual money expenses made by the firm on the factors of production as the ‘cost of production’. That is why this concept of cost is known as ‘accounting cost’ or ‘business cost’ or ‘explicit cost’.

2. **Economic Cost:**
   Economic cost forms part of accounting cost & implicit cost. It can be observed that an entrepreneur invests a certain amount of capital & if this capital invested in his business had been invested else where it would have earned certain amount of interest or dividend. Moreover, an entrepreneur devotes time to his own work of production & contributes his entrepreneurial & managerial ability to do business. Had he not set up his own business he would have sold his services to others for some positive amount of money. Accounting cost do not include these costs. **Thus economic cost include :**
   i) the normal return on money capital invested by the entrepreneur himself in his own business.
   ii) the wages or salary not paid to the entrepreneur but could have been earned if the services had been sold somewhere else. Similarly, the monetary reward for all factors owned by the entrepreneur himself & employed by him in his own business are also considered a part of economic costs. The costs need to be imputed or estimated from what factors could earn in their best alternatives uses are known as ‘implicit cost’. Economic Profit = Total Revenue – Economic Cost
   Accounting Profit = Total Revenue – Accounting Cost
   Accounting profit > economic profit
   Since Economic Cost > Accounting cost

3. **Opportunity cost:**
   Opportunity cost of a particular product is the value of the foregone alternative product that resources used in its production could have produced. Since opportunity cost is the cost of foregone alternative cost, it is also known as ‘alternative cost’. E.g., opportunity cost of using capital is the interest that it can earn in the next best use of equal risk. **Outlay Costs** involve financial expenditure at some time & hence are recorded in the book of accounts-whereas opportunity costs relate to sacrificed alternatives are not recorded in book of a/c.
4. **Direct or traceable cost & indirect or non-traceable costs:**

There are some costs which can be directly attributed to production of a given product. The use of raw-materials, labour input and machine time involved in the production of each unit can be determined. On the other hand, there are certain cost like stationery & other office & administrative expenses, electricity charges, depreciation of plant & buildings & other such expenses that cannot easily and accurately be separated and attributed to individual units of production, except on arbitrary basis. When referring to the separate costs of first category accountants call them the **direct or prime cost** per unit. The joint costs of the second category are referred to as indirect or overhead costs by the accountants.

5. **Fixed and Variable costs:**

Fixed costs remain unchanged even if production changes during short run period e.g., rent, property taxes, cost on plant machinery, buildings, interest on loans, depreciation allowance etc. It is also known as **supplementary cost.** These cost incurred irrespective of the amount of goods produced. Generally, fixed costs cannot be avoided. These costs are fixed so long as operations are going on. They can be avoided only when operations are completely closed down. **We call them as uncontrollable costs.** But there are some costs which will continue even after operations are suspended e.g, the storing of old machines which cannot be sold in the mkt.

Variable costs are those which are incurred on the use of variable factors, such as cost on labour, raw-materials, power, fuel etc – this is called ‘Prime Cost’.

As a whole different types of costs in nutshell.

1. **Accounting Cost** – Costs which are accounted for. It is also called Explicit cost.
2. **Economic Costs** – Costs which are accounted for plus costs which are not incurred but would have been incurred for the employment of self services by the entrepreneurs. In other words it is combination of implicit & explicit cost.
3. **Outlay Cost** – The cost that involves actual expenditure.
4. **Opportunity Cost** – It is concerned with the cost of forgone opportunity.
5. **Direct Cost** – The cost that are readily identified and are traceable to a particular product or line.
6. **Indirect Cost** – The costs that are not readily identified nor visible traceable to a particular product or line.
7. **Fixed Costs** – The costs which donot vary with output upto a certain level of activity are called fixed costs (i.e. in shortly).
8. **Variable Costs** – The costs that are a function of output & vary with change in output.

**STEP– 2,3& 4 : Cost Functions & short run total costs:**

**SHORT-RUN AND LONG -RUN.**

Short-Run: Short Run is a period in which some factors are fixed and some factors are iable. Fixed factor have fixed cost and variable factor have variable cost. So, law of variable jportion applies here. In short-run, output can be increased or decreased by changing variable tors only but fixed factors cannot be varied. Long-Run: Long-Run is a period in which all factors can be varied. There is only variable »st, it’s doesn’t have fixed cost. So law of returns to scale applies here. In long-run output can pe increased or decreased by changing all the factors.

Both short-period and long-period can not be quantified.
D) SHORT RUN TOTAL COSTS
Total cost (TC): Total cost of production is the sum of all expenditure incurred in producing given volume of output. In other words, TC = TFC + TVC

**Total Fixed Cost (TFC):** Fixed Cost does not change with changes in the level of output. JFC is parallel to X-axis. In the figure given below, even at zero output-fixed cost remain the same in the short run. e.g. rent and insurance.

**Total Variable cost (TVC):** Variable Costs are those costs that change with changes in level of input. It has inverse’s shape and start from origin. Figure given below shows that as output is zero cost is also zero and as output increases cost increases, e.g. raw material, power etc.

<table>
<thead>
<tr>
<th>Output (Q)</th>
<th>TFC</th>
<th>TVC</th>
<th>TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>8</td>
<td>18</td>
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<tr>
<td>2</td>
<td>10</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>16</td>
<td>26</td>
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<td>4</td>
<td>10</td>
<td>20</td>
<td>30</td>
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<td>5</td>
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<td>26</td>
<td>36</td>
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<td>6</td>
<td>10</td>
<td>35</td>
<td>45</td>
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<td>7</td>
<td>10</td>
<td>47</td>
<td>57</td>
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<tr>
<td>8</td>
<td>10</td>
<td>63</td>
<td>73</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>83</td>
<td>93</td>
</tr>
</tbody>
</table>

SEMI VARIABLE COSTS (SVC): THERE ARE SOME COSTS WHICH ARE NEITHER PERFECTLY VARIABLE, NOR ABSOLUTELY FIXED IN RELATION TO THE CHANGES IN THE SIZE OF OUTPUT. THEY ARE KNOWN AS SEMI-VARIABLE COSTS. EXAMPLE: ELECTRICITY CHARGES INCLUDE BOTH A FIXED CHARGE AND A CHARGE BASED ON CONSUMPTION.
In the above figure (a), SVC of Electricity is divided in two parts- FC and VC and in figure (b) a Stair-step Variable Cost increases in a stair-step, i.e. remain fixed over certain level of output but suddenly jump to a new higher level of output. Eg Fixed salary of foreman.

(E) SHORT-RUN AVERAGE COST:-

1. **Average Fixed Cost (AFC):** Average fixed cost is the total fixed cost divided by the output. (Per unit FC) or TFC/Q. The general shape of the AFC curve is downward sloping it does not touch the X-axis as AFC cannot be zero. It is not 'U' shape. This curve is also called Rectangular Hyperbola (R.H.).

2. **Average Variable Cost (AVC):** Average variable cost is the total variable cost divided by the output. (Per unit VC) or TVC/Q. The average cost curve will first fall, then reach a minimum and then rise again. It has 'U' shape.

3. **Average Total Cost (ATC):** Average total cost is total cost divided by the output. (Per unit TC) or TC/Q or AFC+AVC. The ATC curve first falls, reaches its minimum and then rises. The ATC curve is 'U' shape due to law of variable proportions.

4. **Marginal Cost (MC):** Marginal cost is the change in total cost due to change in the output. Or MC = ATotal Cost / AQty. produced or MC = ATotal Variable Cost / AQty. produced. The MC curve is also CU' shape. For Ex. 15 units produced at ₹ 200 and 20 units produced at ₹ 250, then calculate MC?

\[
MC = \frac{\Delta TC}{\Delta Unit \, Produced} = \frac{250 - 200}{20 \, \text{units} - 15 \, \text{units}} = \frac{50}{5} = ₹ \, 10 \, \text{units}
\]
### Output (Unit) | Total Fixed cost TFC | Total Variable TVC | Total Cost TC | Average Fixed cost AFC | Average Variables AVC | Average Total AC | Marginal Cost MC
---|---|---|---|---|---|---|---
0 | 10 | -- | 10 | -- | -- | -- | --
1 | 10 | 10 | 20 | 10 | 10 | 20 | 10
2 | 10 | 18 | 28 | 5 | 9 | 14 | 8
3 | 10 | 24 | 34 | 3.33 | 8 | 11.3 | 6
4 | 10 | 28 | 38 | 2.5 | 7 | 9.5 | 4
5 | 10 | 32 | 42 | 2 | 6.4 | 8.4 | 4
6 | 10 | 38 | 48 | 1.67 | 6.33 | 8 | 6
7 | 10 | 46 | 56 | 1.43 | 6.57 | 8 | 8
8 | 10 | 56 | 66 | 1.25 | 7 | 8.25 | 10
9 | 10 | 68 | 78 | 1.11 | 7.55 | 8.67 | 12

(F) RELATIONSHIP BETWEEN AC AND MC: - From the figure given following relation can be explained:

1. MC and AC both can be calculated by TC.

2. When AC falls, MC also falls but AC > MC.

3. When AC rises, MC also rises but now MO

4. When AC is minimum, then MC = AC
   In other words, MC curve cuts to AC curve at its minimum point (i.e. optimum point).

5. There is also abnormal situation when AC falls and MC rises. In the figure given from ‘A’ to ‘E’ AC falls but from ‘B’ to ‘E’ MC rises. But opposite never happened.

<table>
<thead>
<tr>
<th>Output</th>
<th>Total Cost TC</th>
<th>Average Total cost AC</th>
<th>Marginal cost MC</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>AOMC AC decreases MC also decreases MC = AC; AC is minimum</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>20</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>34</td>
<td>11.3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>38</td>
<td>9.5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>42</td>
<td>8.4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>48</td>
<td>8</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>56</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>66</td>
<td>8.25</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>78</td>
<td>8.67</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
Relationship Between, ATC, AVC and MC:
From the figure given following relation can be explained:

1. ATC = AVC + AFC but ATC * AVC, So AVC curve can never touch to ATC curve.
2. MC cuts to ATC and AVC's minimum points

Why are AVC, ATC and MC curves U-shaped? : PRODUCTION AND COST FUNCTION

It is due to Law of Variable Proportions. Law of variable proportions (diminishing returns) states that as the units of variable factor is increased, MP first rises and then falls. When MP rises, MC falls and when MP falls, MC rises. It is the behaviour of MC, which determines the behaviour of AC.

In the above figure when MP is maximum then MC is minimum and when AP is maximum then AC is minimum. Under IInd stage MC and AC both raises.

**STEP - 5 : Problems on Short-run Costs:**

<table>
<thead>
<tr>
<th>Total Costs</th>
<th>Average Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC = FC + TVC or TC = ATC × Q</td>
<td>ATC = ( \frac{TC}{Q} ) or ATC = AFC + AVC</td>
</tr>
</tbody>
</table>
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\[ \text{TFC} = \text{AFC} \times Q \]
\[ \text{TVC} = \text{AVC} \times Q \]
\[ \text{MC} = \frac{\Delta \text{TC}}{\Delta Q} \rightarrow \]
\[ \text{AFC} = \frac{\text{TFC}}{Q} \]
\[ \text{AVC} = \frac{\text{TVC}}{Q} \]

Since \( \text{TC} = \text{TFC} + \text{TVC} \)

When \( Q = 0 \), \( \text{TVC} = 0 \)

\[ \therefore \text{TC} \text{ increases only if TVC increase} \]

Thus me is closely related to TVC so, \( \text{ME} = \frac{\Delta \text{TVC}}{\Delta Q} \)

E.g. (1) Find out marginal cost from the followings:

<table>
<thead>
<tr>
<th>Output (Units)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost (( \text{\text{\text{\text{\text{}}}}} ))</td>
<td>30</td>
<td>48</td>
<td>60</td>
<td>80</td>
<td>90</td>
<td>96</td>
</tr>
</tbody>
</table>

Ans. Calculation of marginal cost

<table>
<thead>
<tr>
<th>Output</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>30</td>
<td>48</td>
<td>60</td>
<td>80</td>
<td>90</td>
<td>96</td>
</tr>
<tr>
<td>MC</td>
<td>30</td>
<td>18</td>
<td>12</td>
<td>20</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

E.g. (2) Calculate average & marginal costs:

<table>
<thead>
<tr>
<th>Output</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost</td>
<td>10</td>
<td>15</td>
<td>22</td>
</tr>
</tbody>
</table>

Ans. Calculation of AC & MC

| Output | TC | 0 | 15 | 22 |
|--------|----|----|----|
| 0      | 10 | 15 | 22 |
| 1      | 15 | 5  | 15 |
| 2      | 22 | 7  | 11 |

E.g. (3) Complete the following table

<table>
<thead>
<tr>
<th>Output</th>
<th>TC</th>
<th>TFC</th>
<th>TVC</th>
<th>AVC</th>
<th>MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>300</td>
<td>300</td>
<td>0</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>1</td>
<td>450</td>
<td>300</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>2</td>
<td>550</td>
<td>300</td>
<td>250</td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>600</td>
<td>300</td>
<td>300</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>620</td>
<td>300</td>
<td>320</td>
<td>80</td>
<td>20</td>
</tr>
</tbody>
</table>

E.g. (4) Find out AVC & MC at each level of output

<table>
<thead>
<tr>
<th>Unit</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC (( \text{\text{\text{\text{\text{}}}}} ))</td>
<td>80</td>
<td>100</td>
<td>118</td>
<td>140</td>
</tr>
</tbody>
</table>
Ans. | Output | TC  | TFC | TVC  | AVC | MC  |
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>80</td>
<td>80</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>100</td>
<td>80</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>118</td>
<td>80</td>
<td>38</td>
<td>19</td>
<td>18</td>
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</tr>
<tr>
<td>3</td>
<td>140</td>
<td>80</td>
<td>60</td>
<td>20</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

STEP: 6 LONG-RUN AVERAGE COST CURVE (LAC) - (ENVELOP CURVE OR PLANNING CURVE)

A long run cost curve depicts the functional relationship between output and the long-run cost of production. In the long-run, all inputs are variable, because costs that are fixed in the short run can be changed in long run. Accordingly, there are no TFC or AFC curves in the long-run. There is no distinction between TC and TVC; we simply use the term ‘TC’. Similarly, there is no distinction between ATC and AVC and we will use the term ‘LAC’.

In the long-run the firm will produce the output at which SAC is minimum. It is clear that in long-run the firm has a choice in the employment of plant and it will employ the plant, which "Ids minimum possible unit cost for producing a given output.

In the figure given below, a firm will produce OQ output at minimum cost CQ, but if firm ant to produce QA output then there are two options, firm can produce at cost LA on SAC, or at ist HA on SAC,, as cost at SAC,< SAC2 (LA<HA), so as to minimise cost firm will produce at C,. The firm can produce OB output, either at SAC 1 or SAC 2 cost are same i.e. QB.

In the long-run the firm will produce the output OQ at which SAC and LAC is minimum Le.OQ. It is to be noted in the above figure, that LAC curve is not tangent at the minimum point of Cs-When LAC declines - SAC is tangent to the falling portion of LAC
When LAC rising - SAC is tangent to the rising portion of LAC
When LAC minimum- SAC is tangent to the minimum point of LAC
The long-run average cost curve will be a smooth curve enveloping all short run average cost curves, so it is called 'enveloping curve.'

Long-run cost curves are often called a planning curve because a firm plans to produce any output in the long-run by choosing a plant on the LAC curve corresponding to the given output. The long-run average cost curve helps the firm in the choice of the size of the plant for producing a specific output at the least possible cost.

**EXPLANATION OF THE "U" SHAPE OF THE LAC CURVE:**

LAC curve is a "U" shape curve. This shape of LAC depends upon the returns to the scale. Returns to scale may be increasing; constant or decreasing. We can summarize all this as follows:

<table>
<thead>
<tr>
<th>Returns to scale</th>
<th>LAC</th>
<th>Internal &amp; External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing returns to scale</td>
<td>LAC decreases</td>
<td>Economies arise here ©</td>
</tr>
<tr>
<td>Constant returns to scale</td>
<td>LAC minimum</td>
<td>Set off economies by diseconomies</td>
</tr>
<tr>
<td>Decreasing returns to scale</td>
<td>LAC increases</td>
<td>Diseconomies arise here ©</td>
</tr>
</tbody>
</table>

The traditional shape of LAC is 'LP shape' but in modern technology, the LAC will be 4L shaped because after getting economies of scale, a firm will always try to minimize the cost and in this way curve will be perfectly flat (from A to B).
Multiple Choice Questions
Chapter - 3 : Theory of Production & Cost
Unit - 2 : (Theory of Cost)

1. Payment made to outsiders for their goods & services are called :
   (a) Opportunity cost  (c) Explicit cost
   (b) Real cost  (d) Implicit cost

2. Direct cost is also known as —
   (a) Indirect cost  (c) Opportunity cost
   (b) Traceable cost  (d) Accounting cost

3. Fixed cost is known as _________ cost
   (a) Prime  (c) Overhead
   (b) Supplementary  (d) Direct

4. Implicit cost may be defined as the :
   (a) Costs which do not change over a period of time.
   (b) Costs which the firm incurs but does not disclose
   (c) Payment to the non-owners of the firm for the resources.
   (d) Money payment which the self employed resources could have earned in their best alternative employment.

5. Opportunity cost is :
   (a) Direct cost  (c) Accounting cost
   (b) Total cost  (d) Cost of foregone opportunity.

6. The cost of one thing in terms of the alternative given up is known as :
   (a) Production cost  (c) Real cost
   (b) Physical cost  (d) Opportunity cost

7. Which of the following is an example of an ‘explicit cost’ ?
   (a) The wages a proprietor could have made by working as an employee of a large firm.
   (b) The income that could have been earned in alternative uses by the resources owned by the firm.
   (c) The payment of wages by the firm.
   (d) The normal profit earned by a firm.

8. Which of the following is an example of an ‘implicit cost’ ?
   (a) Interest that could have been earned on retained earning used by the firm to finance expansion.
   (b) The payment of rent by the firm for the building in which it is housed.
   (c) The interest payment made by the firm for funds borrowed from a bank.
   (d) The payment of wages by the firm.

9. Which of the following is a variable cost in the short run?
   (a) Rent of the factory
   (b) Wages paid to the factory labour
   (c) Interest payments on borrowed financial capital
   (d) Payment on the lease for factory equipments.
(10) The cost which is never zero even when production is stopped is called:
   (a) Fixed cost  (c) Prime cost
   (b) Variable cost (d) Implicit cost

(11) The costs which are prime cost & can be changed with changes in level of output are called
   (a) Fixed cost  (c) Explicit cost
   (b) Variable cost (d) None

(12) Explicit cash payments made by an entrepreneur to the suppliers of various factors of production
   (a) Accounting cost (c) Economic cost
   (b) Total cost (d) Direct cost

(13) Total cost is given in short-run as summation of
   (a) AVCXQ and AFC (c) AFCXQ and AVCXQ
   (b) TFC & AVC (d) None

(14) The shape of AFC curve is
   (a) Downward sloped (c) Rectangular Hyperbola
   (b) Convex to the origin (d) All of the above

(15) Shape of TVC curve is
   (a) Upward sloped (c) Inverted ‘S’ shaped
   (b) Inverted ‘U’ shaped (d) None

(16) The reason behind the slope of TC & TVC curve is
   (a) Production structure (c) Returns to scale
   (b) The objective of minimizing cost (d) Law of variable proportion

(17) Addition made to total cost due to change in output by one more unit is called.
   (a) Average cost (c) Average variable cost
   (b) Total cost (d) Marginal cost

(18) Which of the following is the concept of marginal cost closely related?
   (a) Fixed cost (c) Variable cost
   (b) Opportunity cost (d) Overhead cost

(19) Which of the following is true of the relationship between the marginal cost function &
     the average cost functions is
     (a) If MC is greater than ATC, then ATC is falling.
     (b) The ATC curve intersects the MC curve at minimum MC
     (c) The MC curve intersects the ATC curve at minimum ATC.
     (d) If MC is less than ATC, then ATC is increasing

(20) Which of the following is not a determinant of the firms cost function
     (a) The production function (c) Taxes
     (b) The price of labour (d) The price of firms output

(21) With a given plant size, an increase in the output cannot produce an increase in
     (a) Total cost (c) Average total cost
     (b) Average fixed cost (d) Average variable cost

(22) Which of the following statements is false?
     (a) Marginal cost is equal to the rate of change in variable costs.
     (b) MC is the same whether it is computed from TVC or from TC.
     (c) If AC is above MC, MC must be rising.
     (d) Marginal cost is ‘U’ shaped due to Law of variable proportion.
(23) Economic cost consists of i) explicit cost  ii) implicit cost  iii) normal profit
   (a) i) & ii) only        (c) i) & iii) only
   (b) ii) & iii) only      (d) i), ii) & iii)

(24) The average profit is equal to the difference between
   (a) AC & TC            (c) AR & AC
   (b) AC & VC            (d) AC & TR

(25) Which of the following curves never touch any axis but is downward?
   (a) Marginal cost curve   (c) Average fixed cost curve
   (b) Total cost curve      (d) Average variable cost curve

(26) Suppose output increases in the short run. Total cost will :
   (a) Increase due to an increase in fixed costs only.
   (b) Increase due to an increase in variable cost only.
   (c) Increase due to an increase in both fixed & variable costs.
   (d) Decrease if the firm is in the region of diminishing returns.

(27) Which of the following statements is true of the relationship among the average cost functions?
   (a) $\text{ATC} = \text{AFC} - \text{AVC}$
   (c) $\text{AFC} = \text{ATC} + \text{AVC}$
   (b) $\text{AVC} = \text{AFC} + \text{ATC}$
   (d) $\text{AFC} = \text{ATC} - \text{AVC}$

(28) The efficient scale of production is the quantity of output that minimizes :
   (a) Average fixed cost
   (b) Average variable cost
   (c) Average total cost
   (d) Marginal cost

(29) If average cost is falling, then
   (a) Marginal cost falling
   (b) Marginal cost is rising
   (c) Marginal cost is equal to average cost
   (d) It is impossible to tell if marginal cost is rising or falling.

(30) The following are some of the costs of a clothing manufacture. State which among them will you consider as fixed cost?
   (a) Cost of cloth
   (b) Price wages paid to workers
   (c) Depreciation on machine owing to time
   (d) Cost of electricity for running machines
   (a) Explicit cost
   (b) Implicit cost
   (c) Variable cost
   (d) Fixed cost

(32) Marginal cost is the cost
   (a) Of the last unit production.
   (b) Of the marginal unit.
   (c) Of the marginal efficient unit.
   (d) Of the average unit of product

(33) The cost, “what has to be paid to retain it in its present use” is called
   (a) Nominal cost
   (b) Social cost of factors of production
   (c) Opportunity cost of a factor
   (d) Economic cost of a factor of production
Average variable cost curve
(a) Slopes downward at first & then upwards
(b) Slopes upward, then remaining constant & then falls
(c) Slops downwards
(d) None of the above

If a firm produces zero output in the short period:
(a) Its total cost will be zero
(b) Its variable cost will be zero
(c) Its fixed cost will be positive
(d) Its average cost will be zero

An increase in a firm’s fixed cost will
(a) Change marginal cost but not total cost
(b) Change both marginal & total costs
(c) Change variable cost but not marginal cost
(d) Change total cost but not marginal cost

Of the following which one corresponds to fixed cost?
(a) Payments for raw material
(b) Labour costs
(c) Transportation charges
(d) Insurance premiums on property

With the expansion of output the short run average cost curve, beyond a point, starts rising because:
(a) Average fixed cost increases sharply
(b) More production yields lower per unit price
(c) The law of variable proportions applies to short run production
(d) None of the above

Average fixed cost in short run is
(a) Rising
(b) Falling
(c) Constant
(d) Irrelevant

Average variable cost falls in the beginning as the firm approaches
(a) Maximum possible production
(b) Near capacity production
(c) Minimum possible production
(d) None of the above

Average variable cost rises as the firm approaches
(a) The total product is at a maximum
(b) The marginal product of the variable factor is at a maximum
(c) The factors are combined in their best possible proportions
(d) The average product of the variable factors is at a maximum

Minimum marginal cost occurs at the output where
(a) The total product is at a maximum
(b) The marginal product of the variable factor is at a maximum
(c) The factors are combined in their best possible proportions
(d) The average product of the variable factors is at a maximum

Variable cost includes the cost of
(a) Hiring the building for the factory
(b) Purchasing heavy machines
(c) Paying to manager of the factory
(d) Paying to labourers
(44) Any expansion in output by a firm in the short period will always reduce the
   (a) AVC               (c) Both AFC & AVC
   (b) AFC               (d) None

(45) The distinction drawn between fixed & variable costs is based on
   (a) Whether the costs can or cannot be changed during the life of the plant
   (b) Whether the costs are not legally contracted, hence, unchangeable.
   (c) Whether the costs do not enter the calculation of total costs
   (d) Whether the costs do or do not vary

(46) With the expansion of output the short run average cost curve, beyond a point,
     starts rising because
     (a) AFC increase sharply
     (b) More production yields lower per unit price
     (c) The Law of variable proportion applies to the short run period
     (d) None

(47) AVC falls in the beginning as the firm approaches
     (a) Maximum possible production
     (b) Near capacity production
     (c) Minimum Possible production
     (d) None

(48) The AFC of a firm
     (a) Is independent of the output
     (b) Depends on the output & increases with increase in it
     (c) Depends on the output & decreases with increase in it
     (d) None

(49) MC is given by
     (a) The slope of the TVC curve
     (b) The slope of the TVC curve but not by the slope of the TC curve
     (c) The slope of the TC curve but not by the slope of the TVC curve
     (d) Either the slope of TVC curve or the slope of the TC curve

(50) Marginal cost is found with the help of changes in
     (a) Total fixed cost
     (b) Total variable cost
     (c) Total explicit cost
     (d) Total implicit cost

(51) Marginal cost is
     (a) Always less than the average cost
     (b) Always more than the AC
     (c) Equal to the AC at its minimum point
     (d) Never equal to average cost

(52) Rising portion of marginal cost is due to
     (a) Increasing returns to varying factor
     (b) Decreasing returns to varying factor
     (c) Constant returns to varying factor
     (d) None

(53) Marginal cost at any production level is the extra cost of producing
     (a) First unit of the commodity
     (b) Second unit of the commodity
     (c) Central unit of the commodity
     (d) One extra unit of the commodity

(54) As the production increases beyond a point, the vertical distance between the
     average total cost curve & the average variable cost curve generally
     (a) Diminishes
     (b) Increases
     (c) Remains constant
     (d) Cannot be said without further data
(55) Given a U-shaped average cost curve, the relationship between average cost and
marginal cost is such that marginal cost must always be
(a) Falling when average cost is falling (c) Falling when average cost is rising
(b) Rising when average cost is falling (d) Rising when average cost is rising

(56) As long as the average cost curve is rising
(a) Marginal cost is more than average cost (c) Marginal cost is equal to average cost
(b) Marginal cost is less than average cost (d) Marginal cost has no relation with average cost

(57) When average cost is falling, marginal cost
(a) May also be falling (c) May be rising & falling
(b) May be rising (d) Has no relation with average cost

(58) When average cost is constant, marginal cost
(a) Is equal to average cost (c) May be constant
(b) May be rising (d) May be falling

(59) When average cost is rising, marginal cost
(a) Must be rising (c) May be decreasing & rising
(b) May be decreasing (d) May be falling

(60) Both marginal and average costs are equal to each other when,
(a) Marginal cost is minimum
(b) Average cost is minimum
(c) Both marginal and average costs are minimum
(d) None of the above

(61) A firm’s fixed inputs include –
(a) Its cash deposits at the bank (c) Its work force
(b) Its plant and machinery (d) Raw material purchased from other firms

(62) The lowest point of the ATC curve is
(a) The left of the lowest point of the AVC curve
(b) The right of the lowest point of the AVC curve
(c) The same as the lowest point of AVC curve
(d) None of these

(63) The fall in a firm’s short run average total cost with an increase in production
would be due to which of the following :
(a) The greater divisibility of fixed assets (c) Economics of scale
(b) Diminishing returns to fixed factor (d) Diseconomies of scale

(64) Which one of the following would be a variable cost to a firm ?
(a) Mortgage payments on the factory (c) Depreciation of machines owing to age
(b) The cost of raw materials (d) Interest on debentures

(65) The general average cost curve is also known as
(a) Total unit cost curve (c) Total marginal unit cost curve
(b) Average total unit cost curve (d) Total variable unit cost curve
(66) All money costs can be regarded as:
   (a) Social costs  
   (b) Opportunity costs  
   (c) Explicit costs  
   (d) Real costs  

(67) The firm producing at the minimum point of the AC curve is said to be:
   (a) Operating under diminishing cost  
   (b) Making optimum use of plant capacity  
   (c) Operating at excess capacity  
   (d) Operating under increasing costs  

(68) The vertical distance between TC & TVC is equal to:
   (a) MC  
   (b) AVC  
   (c) TFC  
   (d) None  

(69) Minimum marginal cost occurs at the output where:
   (a) The total product is at a maximum  
   (b) The marginal product of the variable factors are combined in their best possible proportion  
   (c) The factors are combined in their best possible proportion  
   (d) The average product of the variable factors is at a maximum  

(70) Which is an inverted ‘S’ shaped curve?
   (a) AC  
   (b) TVC  
   (c) MC  
   (d) AFC  

(71) If the total cost curve is plotted, marginal cost can be illustrated by:
   (a) A U-shaped curve cutting the total cost curve at its lowest point  
   (b) The slope of a tangent to the curve at any given output  
   (c) A straight line from the origin to the mid-point of the curve  
   (d) A straight line cutting the curve at its lowest point  

(72) Marginal cost curve
   (a) Has the shape of a rectangular hyperbola  
   (b) Has the shape of the alphabet U  
   (c) Has the shape of the inverted U  
   (d) All of these  

(73) “Steps downwards at first and then upwards” it is the movement of:
   (a) AVC curve  
   (b) TVC curve  
   (c) TFC curve  
   (d) TC curve  

(74) The optimum output is the one, which is produced:
   (a) By the optimum firm  
   (b) At the maximum average cost  
   (c) At the minimum average cost  
   (d) At zero marginal cost  

(75) A concept, which has importance in the equilibrium analysis and thus economic analysis, is:
   (a) AFC  
   (b) TFC  
   (c) Opportunity Cost  
   (d) MC  

(76) If a firm’s output is zero, then:
   (a) AFC is +ve  
   (b) AFC is zero  
   (c) Both a & b  
   (d) None of a & b
### AFC Curve is

(a) Convex and downwards sloping  
(b) Concave and downwards sloping  
(c) Convex and upwards sloping  
(d) Concave and upwards sloping

### “U” shaped AC Curve is based on

(a) Law of increasing cost  
(b) Law of diminishing cost  
(c) Law of constant returns to scale  
(d) Law of variable proportion

### At which point does the MC intersect the short run average variable cost and short run average total cost curve

(a) At equilibrium points  
(b) At their lowest points  
(c) At their optimum points  
(d) They don’t intersect at all

### Which of the following curve is never “U” shaped

(a) Average variable cost  
(b) Average cost  
(c) Average fixed cost  
(d) All

### Questions on long run cost:

#### Which of the following curve is known as “Envelope Curve”

(a) Marginal cost  
(b) Average fixed cost  
(c) Long run average cost  
(d) Total fixed cost

#### The normal long-run average cost curve is influenced by the

(a) Principle of diminishing returns  
(b) Economics and diseconomies of large scale production  
(c) Principle of constant returns to scale  
(d) All of the above

#### The point on which the long run average cost is minimum in a firm, short run average cost curve will also be the minimum cost point on the firm’s long run average cost curve. This is

(a) Always true  
(b) Never true  
(c) True when LAC is falling  
(d) True only at that level of output when LAC is minimum

#### The long-run average cost is based on the fact that

(a) None of the factors are variable in the long-run  
(b) All factors are perfectly divisible in the long-run  
(c) None of the factors is divisible  
(d) Management factor is indivisible while all other factors are divisible and can be varied in the long-run

#### The firm producing at the minimum point of the LAC curve is said to be

(a) Operating under diminishing costs  
(b) Making optimum use of plant capacity  
(c) Operating at excess capacity  
(d) Operating under increasing costs

#### If the LAC curve falls as output expands, this fall is due to :

(a) Economics of scale  
(b) The law of diminishing scale  
(c) Diseconomies of scale  
(d) Any of the above
(87) Long run average cost curves are broadly
   (a) U-shaped                   (c) L-shaped
   (b) Inverted U-shaped         (d) Saucer shaped

(88) The cost assigned to factors of productions that the firm neither hires nor purchases is called :
   (a) Social costs               (c) Economic costs
   (b) Opportunity costs          (d) Implicit costs

(89) Each short-run average cost curves coincides with long-run cost curve :
   (a) At upper point             (c) At middle point
   (b) At lower point             (d) No permanent position

(90) The negatively sloped (i.e. falling) part of the long run average total cost is due to which of the following
   (a) Diseconomies of scale.
   (b) Diminishing returns.
   (c) The difficulties encountered in coordinating the many activities of a large firm.
   (d) The increase in productivity that results from specialisation.

(91) The positively sloped (i.e., rising) part of the long run average total cost is due to which of the following ?
   (a) Diseconomies of scale.
   (b) Increasing returns.
   (c) The firm being able to take advantage of large-scale production techniques as it expands its output.
   (d) The increase in productivity that results from specialisation.

(92) A distinguishing characteristic of the long run period is that
   (a) All costs are fixed costs
   (b) All costs are variable cost.
   (c) Fixed costs tend to be greater than variable costs.
   (d) Fixed costs tend to be less than variable costs.

(93) In the long run, if a very small factory were to expand its scale of operations, it is likely that it would initially experience :
   (a) An increase in pollution level.
   (c) Economies of scale
   (b) Diseconomies of scale
   (d) Constant returns to scale

(94) Under constant returns to scale the shape of LAC is :
   (a) Upward rising
   (c) LAC is downward
   (b) Downward falling
   (d) Both a & c

(95) External economies of scale leads to :
   (a) Increasing returns to scale
   (c) LAC is downward
   (b) LAC is upward
   (d) Both a & c

(96) Long run price is also called by the name of
   (a) Market price
   (c) Administered price
   (b) Normal price
   (d) Holesale price
(97) Long run does not have :
(a) Average cost
(b) Total cost
(c) Fixed cost
(d) Variable cost

Questions on Numericals :
A. General Type Problems :
(98) Which of the following is/are short-run cost function
(a) $C = 30Q + 40Q^2 + 30Q^3$
(b) $C = 500 + 3Q + 4Q^2$
(c) $C = 4Q^3 + 5Q^4$
(d) None

(99) For cost function $C = 64 + 24Q - 4Q^2 + Q^3$ AVC & AFC are
(a) $24/Q + 24 - 4Q + Q^2$ & $64/Q$
(b) $24 - 4Q + Q^3$ & $(64 + 24)/Q$
(c) $24 - 4Q + Q^2$ & $64/Q$
(d) None

(100) An auto driver can operate for Rs. 600 per week which is fixed. The variable cost of taking passengers is $Q^3 - 12Q^2$. AVC & AFC are
(a) $600/Q$ & $Q^2 - 12Q$
(b) $Q^2 - 12Q$ & 600
(c) $Q^3 - 12Q$ & $600/Q$
(d) None

(101) The total cost schedule of a firm is
<table>
<thead>
<tr>
<th>Output</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td>100</td>
<td>150</td>
<td>190</td>
<td>250</td>
<td>340</td>
</tr>
</tbody>
</table>

Marginal cost of third unit is
(a) Rs. 30
(b) Rs. 40
(c) Rs. 60
(d) Rs. 90

(102) Cost function $TC = 500 + 100Q - 0.25Q^3$.
If the current output is 100 unit, AFC is
(a) Rs. 500
(b) Rs. 10
(c) Rs. 5
(d) Rs. 100

(103) The following is the marginal cost schedule for a good
<table>
<thead>
<tr>
<th>Output</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginal Cost</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

If the firm produces four units of output, the Average cost of production would be
(a) 6
(b) 5
(c) 4
(d) None

(104) Consider cost function $TC = 1000 + 200Q - 9Q^2 + 0.25Q^3$.
Which of the following statements is/ are true
(a) The Average variable cost function is $200 - 9Q + 0.25Q^2$
(b) Fixed cost is 1000
(c) Variable cost function $200 - 9Q^2 + 0.25Q^2$
(d) a & b
(105) For a firm, the Average cost function is \( AC = \frac{100}{Q} + 20 + 4Q \).

The total variable cost for the firm at an output of 15 units

(a) Rs. 100  
(b) Rs. 750  
(c) Rs. 1200  
(d) Rs. 1340

(106) A firm’s average total cost is Rs. 300 at 5 units of output & Rs. 320 at 6 units of output.

The marginal cost of producing the 6\(^{th}\) unit is:

(a) Rs. 20  
(b) Rs. 50  
(c) Rs. 320  
(d) Rs. 420

(107) A firm producing 7 units of output has an average total cost of Rs. 150 & has to pay Rs. 350 to its fixed factors of production whether it produces or not. How much of the average total cost is made up of variable costs?

(a) Rs. 200  
(b) Rs. 750  
(c) Rs. 300  
(d) Rs. 100

(108) Suppose the total cost of production of commodity x is Rs. 1,25,000. Out of this implicit cost is Rs. 35000 & normal profit is Rs. 25000. What will be the explicit cost of commodity x?

(a) Rs. 90,000  
(b) Rs. 65,000  
(c) Rs. 320  
(d) Rs. 1,00,000

(109) A firm’s average fixed cost is Rs. 20 at 6 units of output what will it be at 4 units of output?

(a) Rs. 60  
(b) Rs. 30  
(c) Rs. 40  
(d) Rs. 20

(110) What is the total cost of production of 20 units, if fixed cost is Rs. 5000 & variable cost Rs. 2 per unit?

(a) 5400  
(b) 5040  
(c) 4960  
(d) 5020

(111) A firm’s average fixed cost is Rs. 40 at 12 units. What will be the average fixed cost at 8 units.

(a) Rs. 60  
(b) Rs. 70  
(c) Rs. 80  
(d) Rs. 90

(112) Calculate total cost of four units:

<table>
<thead>
<tr>
<th>Units</th>
<th>Total cost</th>
<th>Marginal Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
<td>30</td>
</tr>
</tbody>
</table>

(a) 140  
(b) 120  
(c) 50  
(d) 40

(113) From the following detail find out average variable cost of 10 units

<table>
<thead>
<tr>
<th>Output</th>
<th>Total cost</th>
<th>Marginal Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>400</td>
<td>200</td>
</tr>
<tr>
<td>20</td>
<td>800</td>
<td>400</td>
</tr>
</tbody>
</table>

(a) 40  
(b) 20  
(c) 200  
(d) 400
Find out AFC of three units

Output

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
<td>25</td>
<td>35</td>
<td>45</td>
</tr>
</tbody>
</table>

(a) 5  (c) 15
(b) 10  (d) 45

Find out TVC for two units

Output

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>37</td>
</tr>
</tbody>
</table>

Total cost

<table>
<thead>
<tr>
<th></th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

(a) 15  (c) 17
(b) 5  (d) 30

Total cost of 10 units is Rupees two hundred when production increases to 20 units total cost becomes Rs. 600. Find out its marginal cost.

(a) 400  (c) 4
(b) 40  (d) 30

Find out AFC of two units

Output

<table>
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<tr>
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<th>1</th>
</tr>
</thead>
<tbody>
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<td>105</td>
<td>689</td>
</tr>
<tr>
<td></td>
<td>850</td>
<td></td>
</tr>
</tbody>
</table>

Total cost

<table>
<thead>
<tr>
<th></th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>290</td>
</tr>
</tbody>
</table>

(a) 105  (c) 235
(b) 135  (d) 290

For 20 units total cost Rs. 400 and for 40 units total cost Rs. 1200. Find out marginal cost.

(a) 50  (c) 30
(b) 40  (d) None

AFC = Rs. 20, Quantity produced = 10 units. What will be the AFC of 20th Units?

(a) 10  (c) 5
(b) 20  (d) None

Find out Marginal cost of 67 units of production.

Output

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>10</th>
<th>25</th>
<th>37</th>
<th>67</th>
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<tr>
<td></td>
<td>160</td>
<td>200</td>
<td>300</td>
<td>500</td>
<td>1400</td>
</tr>
</tbody>
</table>

Total cost

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>500</td>
</tr>
</tbody>
</table>

(a) 10  (c) 30
B. Advanced Type Problems:

(121) The table shows

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<tr>
<th>Output</th>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
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<td>15</td>
<td>28</td>
<td>38</td>
<td>46</td>
<td>54</td>
</tr>
</tbody>
</table>

(a) Decreasing returns to scale  (c) Increasing returns to scale
(b) Constant returns to scale  (d) Positive fixed cost

(122) The marginal cost for a firm of producing the 9th unit of output is Rs. 20. Average cost at the same level of output is Rs. 15. Which of the following must be true ?
(a) MC & AC are both falling
(b) MC & AC are both rising
(c) MC is rising & AC is falling
(d) It is impossible to tell if either of the curves are rising.

Use the table & answer 123 to 125

<table>
<thead>
<tr>
<th>Output</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
<tr>
<td>TC</td>
<td>240</td>
<td>330</td>
<td>410</td>
<td>480</td>
<td>540</td>
<td>610</td>
<td>690</td>
</tr>
</tbody>
</table>

(123) The average fixed cost of 2 units of output is :
(a) Rs. 80  (c) Rs. 120
(b) Rs. 85  (d) Rs. 205

(124) The marginal cost of the sixth unit of output is :
(a) Rs. 133  (c) Rs. 80
(b) Rs. 75  (d) Rs. 450

(125) Diminishing marginal return starts to occur between units :
(a) 2 & 3  (c) 4 & 5
(b) 3 & 4  (d) 5 & 6

Read the following & answer question 126,127,128

Raj owns a small potters factory. He can make 1,000 pieces of pottery per year & sell them for Rs. 100 each. It costs Raj Rs. 20,000 for the raw materials to produce the 1000 pieces of pottery. He has invested Rs. 100,000 in his factory & equipment; Rs. 50,000 from his savings &Rs. 50,000 borrowed at 10% (Assume that he could have loaned his money out at 10% too). He can work at a competing pottery factory for Rs. 40,000 per year.

(126) The accounting cost at Raj’s pottery factory is :
(a) Rs. 25000  (c) Rs. 80,000
(b) Rs. 50,000  (d) Rs. 75,000
The economic cost at Raj’s factory is:
(a) Rs. 75000
(b) Rs. 70000
(c) Rs. 80000
(d) Rs. 30000

The accounting profit at Raj’s pottery factory is:
(a) Rs. 30000
(b) Rs. 50000
(c) Rs. 80000
(d) Rs. 75000

A firm has a variable cost of Rs.1,000 at 5 units of output. If fixed costs are Rs.400, what will be the average total cost at 5 unit of output?
(a) Rs.250
(b) Rs.60
(c) Rs.120
(d) None

Consider the following table & answer Q.130, 131, 132.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>100</td>
<td>210</td>
<td>300</td>
<td>400</td>
<td>540</td>
<td>790</td>
<td>1060</td>
</tr>
</tbody>
</table>

Total variable cost when 60 units are produced is _________________.
(a) Rs.690
(b) Rs.960
(c) Rs.110
(d) None

Average fixed cost when 20 units are produced ________________.
(a) Rs.5
(b) Rs.3.33
(c) Rs.10
(d) Rs.2.5

Between 10 to 20 burgers, what is the marginal cost?
(a) Rs.11
(b) Rs.13
(c) Rs.14
(d) Rs.9

Consider the followings & answer Q.133 & 134.
A firm sells as much as of its product as it chooses at a market price of Rs.100 per unit by spending Rs.300 for fixed assets. Table shows variable cost for each unit.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>TVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>250</td>
</tr>
<tr>
<td>10</td>
<td>470</td>
</tr>
<tr>
<td>15</td>
<td>700</td>
</tr>
<tr>
<td>20</td>
<td>980</td>
</tr>
<tr>
<td>25</td>
<td>1350</td>
</tr>
<tr>
<td>30</td>
<td>1850</td>
</tr>
<tr>
<td>35</td>
<td>2520</td>
</tr>
<tr>
<td>40</td>
<td>3400</td>
</tr>
<tr>
<td>45</td>
<td>4530</td>
</tr>
<tr>
<td>50</td>
<td>5950</td>
</tr>
</tbody>
</table>
(133) When production is 40 units, the average total cost is:
   (a) Rs.4.40  (c) Rs.85
   (b) Rs.7.50  (d) Rs.92.50

(134) In the table marginal cost per unit that corresponds to 40 units of production is:
   (a) Rs.22    (c) Rs.176
   (b) Rs.85    (d) Rs.880

(135) A firm produces 10 units of output & incurs Rs.30 per unit variable cost & Rs.5 in per unit fixed cost. In this case, total costs:
   (a) Rs.300   (c) Rs.305
   (b) Rs.35    (d) Rs.350

(136) Ramesh inherited 1 acre of land from his grandfather who paid Rs.10,000 cash for the land back in 1961. Today, land in the area sells for Rs.2,00,000 per acre. What is the opportunity cost to Ramesh for keeping the land?
   (a) Nothing, since the land was inherited.
   (b) Nothing, since the grandfather paid cash.
   (c) Rs.1,90,000, since this is what is the difference.
   (d) Rs.2,00,000, since this what Ramesh is giving up by keeping the land.

(137) Find out AVC for 20 unit of output

<table>
<thead>
<tr>
<th>Output (unit)</th>
<th>Total cost (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>20</td>
<td>290</td>
</tr>
<tr>
<td>30</td>
<td>390</td>
</tr>
</tbody>
</table>

   (a) 9.6   (c) 2.9
   (b) 9.5   (d) None
Causes of the application of the law of returns to scale:

(i) Internal and external economics of scale

(ii) Internal and external diseconomies of scale.

Relationship Between, ATC, AVC and MC:

From the figure given following relation can be explained –

1. ATC = AVC + AFC but ATC ≠ AVC, So AVC curve can never touch to ATC curve.

2. MC cuts to ATC and AVC’s minimum points.

(I) LONG – RUN AVERAGE COST CURVE (LAC) :- (ENVELOP CURVE OR PLANNING CURVE)

When LAC declines – SAC is tangent to the falling portion of LAC

When LAC rising – SAC is tangent to the rising portion of LAC

When LAC minimum – SAC is tangent to the minimum point of LAC