Q. No. 1:- ABC company ltd. acquired a plant on April 1, 2012 for Rs.1,50,000 on which freight to the extent of Rs.5000 and installation to the extent of Rs.15,000 was paid. The scrap value of machinery is Rs.10,000 and useful life of machines is 8 years. Calculate the cumulative depreciation (d) at the end of 5th year and book value (BV) at the end of 6th year. Using following methods:

[6 marks]

1. **Straight line method (SLM)**

   a) \( d = \text{Rs.1,00,000} \) & \( \text{BV} = \text{Rs.50,000} \)
   b) \( d = \text{Rs.1,20,000} \) & \( \text{BV} = \text{Rs.30,000} \)
   c) \( d = \text{Rs.80,000} \) & \( \text{BV} = \text{Rs.70,000} \)
   d) \( d = \text{Rs.1,40,000} \) & \( \text{BV} = \text{Rs.10,000} \)

2. **Declining balance method (DBM)**

   a) \( d = \text{Rs.1,55,750.3} \) & \( \text{BV} = \text{Rs.58,753.07} \)
   b) \( d = \text{Rs.1,49,694.6} \) & \( \text{BV} = \text{Rs.14,249.71} \)
   c) \( d = \text{Rs.1,28,768.9} \) & \( \text{BV} = \text{Rs.28,934.65} \)
   d) \( d = \text{Rs.1,41,065.3} \) & \( \text{BV} = \text{Rs.20305.43} \)

3. **Sum of years digit method (SYD)**

   a) \( d = \text{Rs.1,15,555.55} \) & \( \text{BV} = \text{Rs.54,444.44} \)
   b) \( d = \text{Rs.1,33,333.33} \) & \( \text{BV} = \text{Rs.23,333.33} \)
   c) \( d = \text{Rs.1,46,666.66} \) & \( \text{BV} = \text{Rs.36,666.66} \)
   d) \( d = \text{Rs.1,55,750.30} \) & \( \text{BV} = \text{Rs.14,249.71} \)

**Sol. Given:-**

Initial cost = Rs.150000
Transportation cost = Rs.5000
Installation cost = Rs.15000

Total initial cost = Initial cost + Freight + Installation cost

Total initial cost \((V_0)\) = 150000 + 5000 + 15000 = Rs.170000

Service life \((N)\) = 8 years

Scrap Value \((V_S)\) = Rs.10000

Depreciation \((d_s)\) = ? and Book Value \((BV_s)\) = ?

**Straight-line method:**

\[
\text{Depreciation} \ (d) = \frac{\text{Original cost} - \text{Salvage value}}{\text{service life}} = \frac{(V - V_s)}{n}
\]

Depreciation \((d)\) = \(\frac{(170000 - 10000)}{8}\) = Rs. 20000

Depreciation by straight-line method is same for all years.

\[d_1 = d_2 = \ldots = d_5 = d_6 = d_7 = \text{Rs.20000}\]

Book value \((V_a)\) = \((V_0 - ad)\)

Book value at the end of 6th year

\[
\text{Book value} \ (V_a) = 170000 - 6 \times 20000 = \text{Rs.} \ 50000
\]

<table>
<thead>
<tr>
<th>Years</th>
<th>annual depreciation ((d)) ((\text{Rs.}))</th>
<th>Cumulative \text{depreciation}</th>
<th>Book value ((V_a)) = ((V_0 - ad)) At the end of 'a' year (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20000</td>
<td>20000</td>
<td>150000</td>
</tr>
<tr>
<td>2</td>
<td>20000</td>
<td>40000</td>
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<td>20000</td>
<td>100000</td>
<td>70000</td>
</tr>
<tr>
<td>6</td>
<td>20000</td>
<td>120000</td>
<td><strong>50000</strong></td>
</tr>
</tbody>
</table>
Declining balance method:-

Depreciation per annum = Net Book Value x Rate%

\[
\text{Book value } (V_a) = V_0 \times (1 - f)^a
\]

Salvage value after 8 years \((V_S)\) is equal to the book value at the end of 8th year

\[
V_8 = V_S = V_0 \times (1 - f)^8
\]

\[
f = 1 - \left(\frac{V_S}{V_0}\right)^{\frac{1}{8}}
\]

\[
f = 1 - \left(\frac{10000}{170000}\right)^{\frac{1}{8}}
\]

\[
f = 1 - 0.7017685 = 0.2982315
\]

<table>
<thead>
<tr>
<th>Years</th>
<th>annual depreciation ((d) = V_a \times f) (Rs.)</th>
<th>Cumulative depreciation</th>
<th>Book value ((V_a) = V_0 \times (1 - f)^a) At the end of 'a' year (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50699.36</td>
<td>50699.36</td>
<td>119300.6</td>
</tr>
<tr>
<td>2</td>
<td>35579.21</td>
<td>86278.57</td>
<td>83721.43</td>
</tr>
<tr>
<td>3</td>
<td>24968.37</td>
<td>111246.9</td>
<td>58753.07</td>
</tr>
<tr>
<td>4</td>
<td>17522.01</td>
<td>128768.9</td>
<td>41231.05</td>
</tr>
<tr>
<td>5</td>
<td>12296.4</td>
<td>141065.3</td>
<td>28934.65</td>
</tr>
<tr>
<td>6</td>
<td>8629.225</td>
<td>149694.6</td>
<td><strong>20305.43</strong></td>
</tr>
<tr>
<td>7</td>
<td>6055.718</td>
<td>155750.3</td>
<td>14249.71</td>
</tr>
<tr>
<td>8</td>
<td>4249.712</td>
<td>160000</td>
<td>10000</td>
</tr>
</tbody>
</table>
Sum of year’s digits method:-

Service life = 8 years

\[ \sum n = \frac{n(n + 1)}{2} = \frac{8(8 + 1)}{2} = 36 \]

Book value =

The total depreciable value at the start of the service life = 170000-10000 = Rs.160000

<table>
<thead>
<tr>
<th>Years</th>
<th>annual depreciation (d) = ( \frac{(n - a + 1)}{\sum n} (V - V_s) ) (Rs.)</th>
<th>Cumulative depreciation</th>
<th>Book value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35555.556</td>
<td>35555.556</td>
<td>134444.44</td>
</tr>
<tr>
<td>2</td>
<td>31111.11</td>
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<td>103333.334</td>
</tr>
<tr>
<td>3</td>
<td>26666.667</td>
<td>93333.336</td>
<td>76666.667</td>
</tr>
<tr>
<td>4</td>
<td>22222.22</td>
<td>115555.556</td>
<td>54444.447</td>
</tr>
<tr>
<td>5</td>
<td>17777.778</td>
<td>\textbf{133333.334}</td>
<td>36666.667</td>
</tr>
<tr>
<td>6</td>
<td>13333.33</td>
<td>146666.664</td>
<td>\textbf{233333.339}</td>
</tr>
<tr>
<td>7</td>
<td>8888.889</td>
<td>155555.553</td>
<td>14444.45</td>
</tr>
<tr>
<td>8</td>
<td>4444.44</td>
<td>159999.993</td>
<td>10000.01</td>
</tr>
</tbody>
</table>

**Question 2:** ABC Ltd. Purchase a machine for Rs.50,000 on January 1\textsuperscript{st} 2010 and incurred Rs.15000 towards freight and installation charges. It was estimated that its life is 4 years during which period a sum of Rs.15000 is likely to be spent on its repair and maintenance and at the end of the useful life, the scrap value is estimated to be Rs.5000. What will be the annual amount provided for depreciation? Use Repair Provision Method for computation of depreciation.

[2 marks]

a) Rs.17,950  
\textbf{b) Rs.18,750}  
c) Rs.20,250  
d) Rs.19,250
**Sol. Given:**

Machine cost = Rs.50000

Useful life = 4 years

Freight and installation charges = Rs.15000

Scrap value = Rs.5000

Original cost = Machine cost + Freight and installation charges

Original cost = 50000 + 15000 = Rs.65000

\[
\text{Annual amount to be provided for depreciation} = \frac{[(\text{original cost} - \text{salvage value}) + \text{Estimated total cost of repair}]}{\text{Expected useful life}}
\]

Annual amount to be provided for depreciation

\[
= \frac{[(65000 - 5000) + 15000]}{4} = \text{Rs.18,750}
\]

**Question 3:** ABC Company purchased an equipment that has an initial cost of Rs.3,40,000 and expected service life of equipment of 15 years. Company believes that scrap value at the end of service life of equipment will be zero. Calculate the amount of depreciation(d) and book value(V) of equipment at the end of 9th year by using double declining balance method?

[2 marks]

a) V = Rs.83508  d = Rs.14436
b) V = Rs.93805  d = Rs.14426
c) V = Rs.97654  d = Rs.18433
d) V = Rs.78976  d = Rs.17634

**Sol. Given:**

Initial cost of process plant \( (V_0) = \text{Rs.3,40,000} \)

Useful life of equipment \( (n) = 15 \) years

Scrap value after operational life \( V_S = 0 \)

Here the salvage value of the equipment is NIL, so declining balance method is not useful. So here, we can use double decline balance method.

Equipment value = Book Value
\[ V_9 = V_0 \times (1 - f)^9 \]

\[ f = \frac{2}{n} = \frac{2}{15} = 0.1333 \text{ as salvage value is zero } f = \frac{2}{n} \]

\[ V_9 = 340000 \times (1 - 0.1333)^9 \]

\[ V_9 = 340000 \times 0.2759 \]

\[ V_9 = \text{Rs. 93806} \]

Depreciation at the end of 9th year

\[ d_9 = V_8 \times f = V_0 \times (1 - f)^8 \times f \]

\[ d_9 = 340000 \times (1 - 0.1333)^8 \times 0.1333 \]

\[ d_9 = 340000 \times 0.3183 \times 0.1333 \]

\[ d_9 = \text{Rs. 14425.99 = Rs. 14426} \]

**Question 4:** An equipment was purchased on 1st January 2010. The cost of acquisition for equipment was Rs.4,40,000 and at the same time of acquisition useful life and residual value for equipment were estimated to be 10 years and Rs.40,000 respectively. On 1st January 2011 the salvage value was revised to NIL and again on 1st January 2012 the estimated revised useful life was made to 8 years. Using Straight line method calculate depreciation expenses (d) at the end of year 31st Dec. 2010, 2011, 2012 and 2013 respectively?

[3 marks]

\[ a) \quad d_1=\text{Rs.40000}, \quad d_2=\text{Rs.44444}, \quad d_3=\text{Rs.59260}, \quad d_4=\text{Rs.59620} \]
\[ b) \quad d_1=\text{Rs.59260}, \quad d_2=\text{Rs.59620}, \quad d_3=\text{Rs.44444}, \quad d_4=\text{Rs.40000} \]
\[ c) \quad d_1=\text{Rs.59260}, \quad d_2=\text{Rs.44444}, \quad d_3=\text{Rs.59620}, \quad d_4=\text{Rs.40000} \]
\[ d) \quad d_1=\text{Rs.44444}, \quad d_2=\text{Rs.40000}, \quad d_3=\text{Rs.59260}, \quad d_4=\text{Rs.59620} \]

**Sol. Given:**

Cost of acquisition = Rs.4,40,000

Residual value estimated at the time of acquisition = Rs.40,000

Residual value revised on 1st Jan. 2011 = 0

Useful life estimated at time of acquisition = 10 years

Useful life revised on 1st Jan. 2012 = 8 years

Depreciation expense at the end of 31st Dec. 2010

\[ d_1 = \frac{\text{original cost} - \text{Residual value}}{\text{service life}} = \frac{(440000 - 40000)}{10} = \text{Rs. 40,000} \]
From 1st Jan. 2011 onwards (V_S= 0) so depreciation at the end of 2nd year (31st Dec. 2011) \( d_2 \) should be calculated based on the book value at the end of 1st year (as Vs=0) and useful life are left i.e. 9 years.

\[
d_2 = \frac{(\text{original cost} - \text{Residual value} - d_1)}{\text{service life}} = \frac{(440000 - 0 - 40000)}{9} = \text{Rs. 44,444.44}
\]

On 1st Jan. 2012 (V_S= 0) so depreciation at the end of 3rd year (31st Dec. 2012) \( d_3 \) will be computed based on book value at the end of 2nd year (as Vs=0) and the left over useful life based on the revised useful life which was 8 years. Thus the useful life left over = revised useful life(8 years)-years for which depreciation has been charged( 2 years) = 6 years

\[
d_3 = \frac{(\text{original cost} - \text{Residual value} - d_1 - d_2)}{\text{service life}} = \frac{(440000 - 0 - 40000 - 44444.44)}{6} = \text{Rs. 59,259.26}
\]

From 1st Jan. 2013 onward the depreciation will be same for all subsequent years, that is

\[ d_4=d_5=d_6=d_7=d_8=\text{Rs.59, 259.26} \]

**Question 5:** A company purchased a vehicle costing Rs.1,00,000 on 1st Jan. 2011. The company expects that the vehicle will be operational for 4 years. At the end of its operational life, it was sold for Rs.30,000. Calculate the depreciation expenses using straight-line method for the year ending 30th June 2011, 2012, 2013, and 2014 instead of 31st Dec. for the above years. What will be the book value at the end of 30th June 2013 and the depreciation for the financial year (FY) ended on 30th June 2011?

[5 marks]

a) \( d = \text{Rs.14,000} & BV = \text{Rs.38,750} \)

b) \( d = \text{Rs.8,750} & BV = \text{Rs.56,250} \)

c) \( d = \text{Rs.14,000} & BV = \text{Rs.56,250} \)

d) \( d = \text{Rs.8750} & BV = \text{Rs.38,750} \)

**Sol. Given:**

Purchased cost of vehicle (V) = Rs.1,00,000
Salvage value (V_S) = Rs.30,000
Service life of vehicle (n) = 4 years

\[ \text{Depreciation} \]

\[ t = 0 \quad 30^{\text{th}} \text{June 2011} \quad 30^{\text{th}} \text{June 2012} \quad 30^{\text{th}} \text{June 2013} \quad 30^{\text{th}} \text{June 2014} \quad 31^{\text{st}} \text{Dec. 2014} \]

*Time line*
Depreciation (d) = \frac{(Original \ cost - Salvage \ value)}{service \ life} = \frac{(V - V_s)}{n}

Proportional depreciation (d_{0.5}) should be charge for 6 month in the financial year 30^{th} June 2011.

Depreciation at the end of 30^{th} June 2011 = \frac{(100000 - 30000)}{4} \times \frac{6}{12} = \text{Rs.} \, 8750

Book value for first six month from time duration of 1^{st} Jan. 2011 to 30^{th} June 2011

\( (BV)_{1/2} = V - d_{0.5} = 100000 - 8750 = \text{Rs.} \, 91,250 \)

Full year depreciation should be charged in FY ending 30^{th} June 2012, 2013 and 2014. Partial depreciation charged in the year of disposal i.e. FY ended 31^{st} Dec. 2014.

d and BV at FY ended 30/06/2012

\[ d_{1.5} = \frac{(91250 - 30000)}{3.5} = \text{Rs.} \, 17,500 \]

\[ BV_{1.5} = 91250 - 17500 = \text{Rs.} \, 73,250 \]

d and BV at FY ended 30/06/2013

\[ d_{2.5} = \frac{(73250 - 30000)}{2.5} = \text{Rs.} \, 17,500 \]

\[ BV_{2.5} = 73250 - 17500 = \text{Rs.} \, 56,250 \]

d and BV at FY ended 30/06/2014

\[ d_{3.5} = \frac{(56250 - 30000)}{1.5} = \text{Rs.} \, 17,500 \]

\[ BV_{3.5} = 56250 - 17500 = \text{Rs.} \, 38,750 \]

Depreciation(d_{4}) between time period 30^{th} June to 31^{st} Dec. 2014 = 38750-30000= \text{Rs.} \, 8750

Book value for last six months

\[ (BV)\text{at the end of 4th year} = 38750 - 8750 = \text{Rs.} \, 30,000 \]

\textbf{Question 6:-} A courier company purchase a Van on Jan. 1, 2010 at a cost of Rs.5,00,000. The company estimate that the useful life of the van to be 7 years or 430,000 miles and salvage value (SV) at the end of service life to be Rs.1,50,000. The data for the van actual miles driven for first 7 years are given as follows:-
What will be the sum of the cumulative depreciation amounts \( S_d \) at the end of year 2013 and at the end of year 2016 and sum of book values \( S_{BV} \) for the same years, using unit of production method?

\[ [4 \text{ marks}] \]

a) \( S_d = \text{Rs. 5,93,371} \) and \( S_{BV} = \text{Rs. 4,06,628} \)

b) \( S_d = \text{Rs. 5,85,470} \) and \( S_{BV} = \text{Rs. 4,96,826} \)

c) \( S_d = \text{Rs. 4,92,796} \) and \( S_{BV} = \text{Rs. 4,29,386} \)

d) \( S_d = \text{Rs. 4,80,566} \) and \( S_{BV} = \text{Rs. 4,59,524} \)

**Sol. Given:-**

Cost of van purchased on Jan.1, 2010 = Rs.5,00,000

Useful life of van = 7 years or 430,000 miles

Salvage value = Rs.1,50,000

Using unit of production method, depreciation rate per unit mile is calculated by

\[
\text{Depreciation per unit} = \frac{\text{Cost} - \text{SV}}{\text{life in units}} = \frac{500000 - 150000}{430000} = \text{Rs. 0.813953 per mile}
\]

<table>
<thead>
<tr>
<th>Years</th>
<th>Mileage</th>
<th>Annual depreciation ((0.813953 \times \text{mileage}))</th>
<th>cumulative depreciation</th>
<th>Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>87000</td>
<td>70813.91</td>
<td>70813.91</td>
<td>429186.1</td>
</tr>
<tr>
<td>2011</td>
<td>76000</td>
<td>61860.43</td>
<td>132674.3</td>
<td>367325.7</td>
</tr>
<tr>
<td>2012</td>
<td>71000</td>
<td>57790.66</td>
<td>190465</td>
<td>309535</td>
</tr>
<tr>
<td>2013</td>
<td>65000</td>
<td>52906.95</td>
<td>243371.9</td>
<td>256628.1</td>
</tr>
</tbody>
</table>
**Sum of the cumulative depreciation amount (S_d) for year 2013 and 2016= 243371.9 + 350000 = Rs.5,93,371.9**

**Sum of Book value (S_{BV}) for year 2013 and 2016 = 256628.1 + 150000 = Rs.4,06,628.1**

**Question 7:** A courier company purchased a Van on 1st Jan, 2010 at a cost of Rs.5,00,000. The company estimate the useful life of the van to be 7 years and salvage value (SV) at the end of service life to be Rs.1,50,000. What will be the annual depreciation (d) for the year 2014 and book value (BV) at the end of year 2013, using double declining balance method (DDBM)?

[4 marks]

a) $d = Rs.60,738.58$ and $BV = Rs.1,51,857.08$

b) $d = Rs.30,906.67$ and $BV = Rs.1,50,000$

c) $d = Rs.56,533.33$ and $BV = Rs.2,26,133.33$

d) $d = Rs.45,226.67$ and $BV = Rs.2,26,133.33$

**Sol. Given:-**

Cost of van purchased on June 1, 2010 $(V) = Rs.5,00,000$

Useful life of van $(N) = 7$ years

Salvage value $(V_S) = Rs.1,50,000$

Using DDBM

Depreciation rate for DDBM = $2*(V-V_S)*100/(V*N)$

Depreciation rate $= \frac{2 \times (500000 - 150000)}{7 \times 500000} = 20\%$

Book value at the start of 1st year is Rs.5,00,000 because no depreciation has taken on the asset yet.

Year 2010:-

Depreciation = Depreciation rate * Book value at start of the year

$Depreciation\ (d_1) = 0.2 \times 500000 \times \frac{7}{12} = Rs.58,333.33$

Book value at the end of 2010 $(BV_1) = 500000-58333.33 = Rs.4,41,666.67$
<table>
<thead>
<tr>
<th>Years</th>
<th>Depreciation rate</th>
<th>Annual Depreciation = (Depreciation rate * Book value) (in Rs.)</th>
<th>Cumulative depreciation</th>
<th>Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>0.2</td>
<td>58333.33</td>
<td>58333.33</td>
<td>441666.67</td>
</tr>
<tr>
<td>2011</td>
<td>0.2</td>
<td>88333.33</td>
<td>146666.67</td>
<td>353333.33</td>
</tr>
<tr>
<td>2012</td>
<td>0.2</td>
<td>70666.67</td>
<td>217333.33</td>
<td>282666.67</td>
</tr>
<tr>
<td>2013</td>
<td>0.2</td>
<td>56533.33</td>
<td>273866.67</td>
<td>226133.33</td>
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<tr>
<td>2014</td>
<td>0.2</td>
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<td>319093.33</td>
<td>180906.67</td>
</tr>
<tr>
<td>2015</td>
<td>0.2</td>
<td>30906.67</td>
<td>350000</td>
<td>150000</td>
</tr>
<tr>
<td>2016</td>
<td>0.2</td>
<td>0</td>
<td>350000</td>
<td>150000</td>
</tr>
</tbody>
</table>

We cannot take the full amount of depreciation calculated. Instead, we are limited to Rs.30,906.668 in 2015. Since we have hit salvage value, there is no depreciation in 2016.

Q. No. 8:- Calculate depreciation over the useful life of an asset using the sum of year’s digits method. Cost of the fixed asset is Rs.2,00,000 and the scrap value after 5 years is estimated to be Rs.40,000. What is the depreciation expenses for 4th year and what is the book value at the end of 3rd year?

[3 marks]

a) d = Rs.42,667 & BV = Rs.1,46,667
b) d = Rs.32,000 & BV=Rs.50,667
c) d = Rs.21,333& BV = Rs.72,000
d) d = Rs.10,667 & BV = Rs.1,04,000

Sol. Given: -

Cost of asset (V) = Rs.2,00,000
Scrap Value (V_s) = Rs.40,000
Useful life of asset (n) = 5 years

Using sum of years digits method

\[ d_a = \text{depreciation for year } a = \frac{n - a + 1}{\sum_1^n n} \times (V - V_s) \]

sum of years digits = \[ \sum_1^n n = \frac{n(n + 1)}{2} = \frac{5(5 + 1)}{2} = 15 \]

The total depreciable value at the start of the service life (V-V_s)

\[ = 2,00,000 - 40,000 = \text{Rs.1,60,000} \]
<table>
<thead>
<tr>
<th>end of year</th>
<th>Depreciation expenses $d_a = \frac{n - a + 1}{\sum_{i=1}^{n}} (V - V_s)$</th>
<th>Book value at the end of year $i = (BV_{i-1} - d_i)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$d_1 = \frac{5}{15} \times (1,60,000) = Rs. 53,333$</td>
<td>$BV_1 = (200000 - 53333) = Rs. 1,46,667$</td>
</tr>
<tr>
<td>2</td>
<td>$d_1 = \frac{4}{15} \times (1,60,000) = Rs. 42,667$</td>
<td>$BV_1 = (146667 - 42667) = Rs. 1,04,000$</td>
</tr>
<tr>
<td>3</td>
<td>$d_1 = \frac{3}{15} \times (1,60,000) = Rs. 32,000$</td>
<td>$BV_1 = (104000 - 32000) = Rs. 72,000$</td>
</tr>
<tr>
<td>4</td>
<td>$d_1 = \frac{2}{15} \times (1,60,000) = Rs. 21,333$</td>
<td>$BV_1 = (72000 - 21333) = Rs. 50,667$</td>
</tr>
<tr>
<td>5</td>
<td>$d_1 = \frac{1}{15} \times (1,60,000) = Rs. 10,667$</td>
<td>$BV_1 = (50,667 - 10,667) = Rs. 40,000$</td>
</tr>
</tbody>
</table>

**Question 9:** On January 1, 2006, M/s ABD Corporation purchased a machine at a cost of Rs.55,000. The machine was expected to have a service life of 10 years and no salvage value. In 2008 the estimate of salvage value was revised from zero to Rs.6,000. What is the depreciation for 2008? If straight-line depreciation method is used.

[2 marks]

a) Rs.3,800  
b) Rs.4,400  
c) **Rs.4,750**  
d) Rs.5,500

**Sol. Given:**

Original cost of machine ($V$) = Rs.55,000  
Salvage value ($V_s$) = Rs.0  
Useful life = 10 years

Using straight-line method-

**Depreciation for year 2006:**

$$Depreciation (d) = \frac{(Original \ cost - Salavge \ value)}{service \ life} = \frac{(V - V_s)}{n}$$
Depreciation (d) = \frac{(55000 - 0)}{10} = Rs.5500

Depreciation using straight line method is equal for all years. So, depreciation for year 2007 is also Rs.5500.

Now, salvage value is revised (say from 1st Jan., 2008) and it became Rs.6000 at the end of service life. We calculate the depreciation for remaining years(10-2=8) based on the book value at the end of 2nd year and salvage value taking Rs.6000. Book value at the end of 2nd year is Rs.44,000 (55,000-5500-5500). So, remaining service life is 8 years (10-2=8).

Depreciation for year 2008.

\[
Depreciation \ (d) = \frac{(55000 - 5500 - 5500 - 6000)}{8} = Rs. 4750
\]

**Question 10:-** In question 9, assume that instead of revising salvage value, in the year 2008 the company switched to sum of years digits method (SYD). Then depreciation for the year 2008 should be:

a) Rs.5,500  
b) Rs.9,778  
c) Rs.8,444  
d) Rs.11,000

**Sol. Given:--**

Original cost of machine (V) = Rs.55,000  
Salvage value (V_s) = Rs.0  
Useful life = 10 years

Using straight-line method-

Depreciation for year 2006:-

\[
Depreciation \ (d) = \frac{(Original \ cost - \ Salvage \ value)}{service \ life} = \frac{(V - V_s)}{n}
\]

\[
Depreciation \ (d) = \frac{(55000 - 0)}{10} = Rs.5500
\]
Depreciation using straight line method is equal for all years. So, depreciation for year 2007 is also Rs.5500 as from 2008 the depreciation method is changed to sum-of-the-years-digit method.

We calculate the depreciation for remaining years(10-2=8) based on the book value at the end of 2\textsuperscript{nd} year but switching to sum-of-the-years-digit method. Book value at the end of 2\textsuperscript{nd} year is Rs.44,000 (55,000-5500-5500) and remaining service life is 8 years (10-2=8).

Depreciation for year 2008 using SYD method keeping salvage value zero-

\[
d_a = \text{depreciation for year } a = \frac{n - a + 1}{\sum_1^n n} \times (V - V_S)
\]

\[
\text{sum of years digits} = \sum_1^n n = \frac{n(n + 1)}{2} = \frac{8(8 + 1)}{2} = 36
\]

\[
\text{Depreciation for year 2008} = \frac{8}{36} \times (55000 - 5500 - 5500 - 0) = \text{Rs. 9,778}
\]