Section 4: Case Study – Maximize the Benefit

Relates to Questions 28-38

Time Allocated: 36 minutes

INTRODUCTION

You are working for a vehicle parts manufacturer called Parts 4 Less ("P4L"). P4L are investigating the construction of a new plant to produce vehicle parts. P4L operate in a country where there are four different methods possible for tax depreciation. P4L can choose to depreciate under any of these four methods. Once selected, which method is chosen can not be changed and must be used for all asset classes.

You will need to develop a model to forecast the depreciation and net book value of P4L's assets under each method. The model will be annual and cover 20 years from 1 January 2017 until 31 December 2036.

The key model inputs (discussed below) have been provided to you in the Excel file titled 'MO16 Round 2 - Sec 4 - Maximize the Benefit.xlsx'.

CAPITAL EXPENDITURE

P4L will own assets in five different classes (A, B, C, D, E). The new plant will have capital expenditure across each of these five asset classes. There is no existing asset balance for any asset class.

The capital expenditure profile for each asset class is provided in the supporting Excel file. This capital expenditure is real as at 1 January 2017. These values should be inflated by 2% per annum on 1 January of each year from 1 January 2018 onwards.

Assume all capital expenditure occurs at the start of the year. There is no salvage value or residual value for any asset class.

DEPRECIATION ASSUMPTIONS AND METHODS

The four depreciations methods possible are:

1. Declining balance (also known as diminishing value).
2. Straight line
3. Units of production
4. Sum of the years

The key assumptions for each method by asset class are provided in the supporting Excel file and in the table below:

Method	**Declining balance**	**Straight line**	**Units of production**	**Sum of the years**
Unit	**Annual %**	**Useful life, years**	**See Excel file**	**Useful life, years**
Class A	40%	12 years	See Excel file	12 years
Class B	5%	9 years	See Excel file	9 years
Class C	15%	7 years	See Excel file	7 years
Class D	20%	15 years	See Excel file	15 years
Class E	15%	24 years	See Excel file	24 years

DEPRECIATION METHOD EXAMPLES

The example used for this section will be for an asset purchased at the start of 2017 for $100:

1) Declining balance

The asset is depreciated based on a % of the remaining asset balance.

Example – using a declining balance rate of 60% per annum

Method	2017	2018	2019	2020	Notes
Opening balance	-	40.00	16.00	6.40	The depreciation calculation continues indefinitely.
Additions	100.00	-	-	-	
Depreciation	(60.00)	(24.00)	(9.60)	(3.84)	
Closing balance	40.00	16.00	6.40	2.56	

2) Straight line

The asset is depreciated in an equal amount over each year of its useful life.

Example – using a useful life of 3 years

Method	2017	2018	2019	2020	Notes
Opening balance	-	66.67	33.33	-	As the asset has a 3 year useful life, it is depreciated by 1/3 of its initial value per year.
Additions	100.00	-	-	-	
Depreciation	(33.33)	(33.33)	(33.33)	-	
Closing balance	66.67	33.33	-	-	

3) Units of production

The asset is depreciated in accordance with the % of its total lifetime units it produces each year.

Example – using a depreciation profile of 70% in year 1, 20% in year 2 and 10% in year 3

Method	2017	2018	2019	2020	Notes
Opening balance	-	30.00	10.00	-	The depreciation profile of 70%, 20% and 10% is applied to the initial cost to calculate the annual depreciation.
Additions	100.00	-	-	-	
Depreciation	(70.00)	(20.00)	(10.00)	-	
Closing balance	30.00	10.00	-	-	

4) Sum of the years

The asset is depreciated in proportion to the remaining years of the asset's life. In this example, there are 3 years remaining in year 2017, 2 years remaining in 2018 and 1 year remaining in 2019.

Example – using a useful life of 3 years

Method	2017	2018	2019	2020	Notes
Opening balance	-	50.00	16.67	-	3 year useful life means the depreciation will be 3 + 2 + 1 years (total of 6 years). The depreciation will be 3/6 in year 1, 2/6 in year 2 and 1/6 in year 3.
Additions	100.00	-	-	-	
Depreciation	(50.00)	(33.33)	(16.67)	-	
Closing balance	50.00	16.67	-	-	

OTHER ASSUMPTIONS

- The corporate tax rate applied to the depreciation calculations is 32%.
- When comparing depreciations methods, use a discount rate of 11% per annum and calculate your discount factors as 1 / (1 + r) ^ n. Assume all depreciation charges and tax flows occur at the end of the period when discounting.

For Questions 28 to 35, select your answer from a multiple choice list.
For Questions 36 to 37, you are required to type in your answer.