**Accounting and Finance**

**Unit 3**

**Accounting and Finance For WA**

**Chapter 3 – Capital Investment Decisions**

**Test Your Knowledge**

**Question 1**

**List five different types of capital expenditure items.**

Five different types of capital expenditure items could include:

* establishing a new store;
* purchasing new machinery;
* acquiring new technology;
* starting the production of a new product;
* taking over an existing business; or
* investing in a financial institutions investment fund.

**Question 2**

**Describe the characteristics of capital expenditure items.**

* *Usually involve large sums of money relative to the size of the business operation.* The purchase of a delivery vehicle for a small business may be a large outlay but the acquisition of one delivery vehicle for a supermarket chain would not be that significant. However, if the supermarket chain were to replace all of its delivery vehicles at one time, then it would be a large outlay. Due to the large cost of the investment, businesses will often have to raise finance in addition to their own funds.
* *The expenditure is usually for the long term.* The acquisition of non-current assets means that the impact of the decision will be felt by the business for a long period of time. There is an expectation that the assets will generate cash flow and profit over time and that they will be sufficient to repay the debt finance, if required, also over a long period.
* *The decision cannot be easily reversed*. The decisions are difficult to change as the outlay has been made and to make any change would be costly to the business. For example, if, one year after the purchase of a particular type of delivery vehicle, the decision turns out to be the wrong one because a more advanced vehicle is now in the market, the cost of selling the now unsuitable vehicle will involve a considerable loss because of its substantially reduced market value.
* *They have a high risk attached to them*.The combination of the three previous characteristics mentioned above means that the assets must generate cash flow and profits well into the future so that lenders can be repaid and investors receive a reward. The long term is uncertain as it can be difficult to predict, for example:
	+ the rate of technological change;
	+ economic circumstances;
	+ customer preferences; and
	+ what your competitors will do.

**Question 3**

**Explain why capital investment decisions are important.**

Capital expenditures take time to mature but are vital to the long-term effectiveness and efficiency of the business. Investors, lenders, employees and customers are all interested in the capital investment decision as it will affect them in some way. Capital expenditures have a large impact on a business and it is expected that they will:

* earn a reasonable rate of return;
* improve productivity;
* enable the growth of the business; and
* advance product or service quality.

**Question 4**

**What factors affect capital investment decisions?**

The capital investment decision-making process should involve both an analysis of the quantitative (ie. accounting and finance techniques) and qualitative aspects of the alternative projects or options that are available for consideration.

When management makes a capital investment decision it must consider the qualitative aspects of the decision. These impacts are difficult to quantify but are about the business trying to gain a strategic advantage in the market, as a result of the investment project or asset acquisition.

**Question 5**

**What is meant by the ‘cost of capital’?**

The minimum rate of return, or profit, a company must earn before generating value. It's calculated by a business's accounting department to determine financial risk and whether an investment is justified.

**Question 6**

**Explain the importance of ‘qualitative factors’ in capital investment decisions. Give examples to support your answer.**

Capital investment decisions require consideration of qualitative aspects, such as improvements in product quality, business image and competitiveness; reductions in environmental impacts; and the morale of employees.

Examples of qualitative impacts of capital investment decisions include:

* employee morale;
* effect on other parts of the business;
* environmental impact;
* effect on future business opportunities;
* effect on the business’s image; and
* changes to the quality of product.

**Question 7**

**Explain how customer preferences, competitors and government regulation can affect capital investment decisions. Give examples to support your answer.**

**Customer Preferences** – critical in the marketing process is the fact that the customer and their demand for a product or service is influenced by their perceptions of the business. The customer’s preferences will alter according to such influences as:

* changing fashion;
* habits; and
* social values.

For example, customers and investors are looking more and more for businesses to make socially and environmentally responsible investments and they may boycott those businesses that do not operate accordingly.

**Competitors** – in any industry, competition is intense and a business must keep up with or get ahead of its competitors. It must analyse all parts of the business operation, such as:

* marketing approach;
* productivity;
* technology;
* resources;
* financial investments; and
* environmental impact.

It is essential to look for innovation, keep costs to a minimum and maximise revenue-earning potential. These aspects will affect the decisions that managers make and they may consider that these factors will outweigh any unacceptable quantitative results, such as a negative net present value.

**Government Regulation** – a business must consider the attitude of regulators, such as governments, when considering the acquisition or replacement of assets, or an investment in a project. Corporate social responsibility is influenced by government policy and regulation. For example, businesses must:

* adhere to government demands to reduce environmental impacts
* meet regulations regarding occupational health and safety
* comply with government requirements concerning native title

At the local government level, businesses must operate under the by-laws relating to such aspects as:

* health and safety;
* business zoning; and
* building construction.

**Question 8**

**Define the payback period.**

Is the period of time it takes for the cash flows from an investment to exceed the initial cost of the investment. The shorter the payback period, the better. Therefore, if there are two or more options available, the one with the smallest payback is the project that should be preferred.

**Question 9**

**Describe the advantages and disadvantages of the payback period.**

**Advantages**

* it is a simple technique;
* it is easily understood by business managers as they appreciate the importance of cash outlays being recouped; and
* it gives the manager some appraisal of the financial risk attached to a project.

**Disadvantages**

* it does not consider the time value of money. Each period’s cash inflow is considered to have the same value as the next and, this is not necessarily true;
* cash received after the payback period is not considered. Some projects may take a number of periods to generate good cash inflows and they may, in the long term, be better than those with short payback periods.

**Question 11**

**Explain the concept of the ‘time value of money’.**

Is a concept that states money today does not have the same value in the future and this is due to the impact of inflation and interest rates.

**Question 12**

**What do you understand about by the present value of an item?**

Cash flows over time have different values. Therefore, if we wish to add them all together and make valid comparisons over time, we must ensure that they are all the same equivalent value – usually their current value (present value). This practice of converting future cash flows to their present value is called the *discounted cash flow* technique.

When we calculate the present value of an item we use what is called the discount rate. The connection between a future value and a present value is that the discount rate and the interest rate (or rate of return) are in fact the same.

**Question 13**

**Describe the advantages and disadvantages of the net present value method.**

**Advantages**

* it takes into consideration the time value of money; and
* the cash flows from the project, over its entire lifetime are taken into consideration.

**Disadvantages**

* it can be difficult to determine an appropriate discount rate/cost of capital;
* it does not take into account of risk; and
* it is more complex and can be difficult to explain.

**Question 14**

**Which capital investment technique is the recommended method of evaluating capital expenditure items and why?**

Cash inflows and outflows are considered a better determinant of the success of a capital investment project as they are what truly determines the value of an investment. It is possible to measure the time value of money. The net present value method (NPV) technique considers the time value of money, taking into account the importance of cash flows rather than profit. It is therefore considered the best method of evaluating capital expenditure items.

**Test Your Understanding**

**Exercise 3.1**

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| **Constant Net Cash Flows** |

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| **Payback Period =** | **Initial Cost of Investment** |
| **Net Cash Flows** |

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| --- | --- |
| **Payback Period =** | $38 000 |
| $ 8 000 |

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| **Payback Period =** | 4.75 |

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| **Payback Period =** | 0.75 x 12 = 9 |

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| --- | --- |
| **Payback Period =** | **4 Years and 9 Months** |

**Exercise 3.2**

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| **Constant Net Cash Flows** |

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| **Payback Period =** | **Initial Cost of Investment** |
| **Net Cash Flows** |

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| **Net Cash Flows =**  | $12 000 + $900 + $1 100 + $1 000 + $2 500 = $17 500 |

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| **Payback Period =** | $80 000 |
| $17 500 |

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| **Payback Period =** | 4.571 |

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| **Payback Period =** | 0.571 x 12 = 6.852 |

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| **Payback Period =** | **4 Years and 7 Months** |

**Exercise 3.3**

**Requirement A**

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| **Constant Net Cash Flows** |

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| **Payback Period =** | **Initial Cost of Investment** |
| **Net Cash Flows** |

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| **Option A** |

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| **Payback Period =** | $40 000 |
| $11 000 |

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| **Payback Period =** | 3.636 |

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| **Payback Period =** | 0.636 x 12 = 7.632 |

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| **Payback Period =** | **3 Years and 8 Months** |

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| **Option B** |

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| **Payback Period =** | $50 000 |
| $13 000 |

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| **Payback Period =** | 3.846 |

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| **Payback Period =** | 0.846 x 12 = 10.152 |

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| **Payback Period =** | **3 Years and 11 Months** |

**Requirement B**

Option B has the higher risk due to a larger initial cost of investment combined with a longer payback period.

**Exercise 3.4**

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| **Differing Net Cash Flows** |

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| **Accumulated Cash Flows** |
| **Year** | **Net Cash Flows** | **Accumulated Cash Flows** |
| 1 | $30 000 | $30 000 |
| 2 | $35 000 | $65 000 |
| 3 | $33 000 | $98 000 |
| 4 | $28 000 | **$126 000** |
| 5 | **$27 000** | **$153 000** |
| 6 | $22 000 | $175 000 |
| 7 | $19 000 | $194 000 |
| 8 | $14 000 | $208 000 |
| 9 | $13 000 | $221 000 |

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| **Step 1** | Calculate the cumulative cash flows for each year. | At the end of **Year 4** we have accumulated **$126 000** and at the end of **Year 5** we have accumulated **$153 000**. The initial investment is recovered after **Year 4** but before the completion of **Year 5**. |

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| **Step 2** | Determine the amount still to be recovered after **Year 4**. | $150 000 - $126 000 | = $24 000 |

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| **Step 3** | Calculate the proportion of the amount to be recovered is of the total to be recovered in **Year 5**. | $24 000$27 000 | = 0.888 |

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| This proportion can be expressed in months as follows: |

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| **Payback Period =** | 0.888 x 12 months = 10.656 |

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| **Payback Period =** | **4 Years and 11 Months** |

**Exercise 3.5**

**Requirement A**

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| **Differing Net Cash Flows** |

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| **Accumulated Cash Flows** |
| **Year** | **Net Cash Flows** | **Accumulated Cash Flows** |
| 1 | $18 000 | $18 000 |
| 2 | $18 000 | $36 000 |
| 3 | $16 000 | $52 000 |
| 4 | $16 000 | **$68 000** |
| 5 | **$15 000** | **$83 000** |
| 6 | $12 000 | $95 000 |
| 7 | $10 000 | $105 000 |

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| **Step 1** | Calculate the cumulative cash flows for each year. | At the end of **Year 4** we have accumulated **$68 000** and at the end of **Year 5** we accumulated **$83 000**. The initial investment is recovered after **Year 4** but before the completion of **Year 5**. |

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| **Step 2** | Determine the amount still to be recovered after **Year 4**. | $75 000 - $68 000 | = $7 000 |

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| **Step 3** | Calculate the proportion of the amount to be recovered is of the total to be recovered in **Year 5**. | $7 000$15 000 | = 0.466 |

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| This proportion can be expressed in months as follows: |

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| **Payback Period =** | 0.466 x 12 months = 5.592 |

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| **Payback Period =** | **4 Years and 6 Months** |

**Requirement B**

The project should not be accepted because the payback period is longer than the predetermined acceptable payback period of 4 Years.

**Exercise 3.6**

**Requirement A**

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| **Differing Net Cash Flows** |

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| **Option A** |

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| **Accumulated Cash Flows** |
| **Year** | **Cash Sales** | **Costs** | **Net Cash Flows** | **Accumulated Cash Flows** |
| 1 | $55 000 | $30 000 ($25 000 + $5 000) | $25 000 | $25 000 |
| 2 | $60 000 | $27 000 | $33 000 | $58 000 |
| 3 | $75 000 | $29 000 | $46 000 | **$104 000** |
| 4 | $78 000 | $30 000 | **$48 000** | **$152 000** |
| 5 | $80 000 | $33 000 | $47 000 | $199 000 |
| 6 | $80 000 | $35 000 | $45 000 | $244 000 |
| 7 | $82 000 | $36 000 | $46 000 | $290 000 |

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| **Step 1** | Calculate the cumulative cash flows for each year. | At the end of **Year 3** we have accumulated **$104 000** and at the end of **Year 4** we accumulated **$152 000**. The initial investment is recovered after **Year 3** but before the completion of **Year 4**. |

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| **Step 2** | Determine the amount still to be recovered after **Year 3**. | $140 000 - $104 000 | = $36 000 |

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| **Step 3** | Calculate the proportion of the amount to be recovered is of the total to be recovered in **Year 4**. | $36 000$48 000 | = 0.75 |

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| This proportion can be expressed in months as follows: |

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| **Payback Period =** | 0.75 x 12 months = 9 |

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| **Payback Period =** | **3 Years and 9 Months** |

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| **Option B** |

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| **Accumulated Cash Flows** |
| **Year** | **Cash Sales** | **Costs** | **Net Cash Flows** | **Accumulated Cash Flows** |
| 1 | $56 000 | $31 000 ($26 000 + $5 000) | $25 000 | $25 000 |
| 2 | $62 000 | $26 000 | $36 000 | $61 000 |
| 3 | $73 000 | $29 000 | $44 000 | **$105 000** |
| 4 | $75 000 | $31 000 | **$44 000** | **$149 000** |
| 5 | $80 000 | $32 000 | $48 000 | $197 000 |
| 6 | $81 000 | $38 000 | $43 000 | $240 000 |
| 7 | $84 000 | $40 000 | $44 000 | $284 000 |

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| **Step 1** | Calculate the cumulative cash flows for each year. | At the end of **Year 3** we have accumulated **$105 000** and at the end of **Year 4** we accumulated **$149 000**. The initial investment is recovered after **Year 3** but before the completion of **Year 4**. |

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| **Step 2** | Determine the amount still to be recovered after **Year 3**. | $120 000 - $105 000 | = $15 000 |

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| **Step 3** | Calculate the proportion of the amount to be recovered is of the total to be recovered in **Year 4**. | $15 000$44 000 | = 0.340 |

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| This proportion can be expressed in months as follows: |

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| **Payback Period =** | 0.340 x 12 months = 4.08 (5 Months) |

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| **Payback Period =** | **3 Years and 5 Months** |

**Requirement B**

Option A has the higher risk due to a larger initial outlay and a longer payback period.

**Exercise 3.11**

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| **Schedule of Annual Net Cash Flows** |

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| --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** |
| $50 000 - $30 000 | $48 000 - $35 000 | ($45 000 + $12 000) - $36 000 |

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| --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** |
| **$20 000** | **$13 000** | **$21 000** |

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| --- | --- |
| **PV =** | **NCF** |
| **(1 + i)n** |

|  |  |  |  |
| --- | --- | --- | --- |
| **PV =** | **Year 1** | **Year 2** | **Year 3** |
| $20 000 | $13 000 | $21 000 |
| (1 + 0.09) | (1 + 0.09)2 | (1 + 0.09)3 |

|  |  |  |  |
| --- | --- | --- | --- |
| **PV =** | **Year 1** | **Year 2** | **Year 3** |
| **$18 349** | **$10 942** | **$16 216** |

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| **PV =** | **$45 507** |

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| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

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| **NPV =**  | $45 507 - | $45 000 |

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| **NPV =** | **(+ve) $507** |

**Exercise 3.12**

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| **Schedule of Annual Net Cash Flows** |

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| --- | --- | --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| $45 000 – $18 000 | $43 000 – $18 000 | $40 000 – $19 000 | $38 000 – $21 000 | ($32 000 + $8 000) – $23 000 |

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| --- | --- | --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| **$27 000** | **$25 000** | **$21 000** | **$17 000** | **$17 000** |

|  |  |
| --- | --- |
| **PV =** | **NCF** |
| **(1 + i)n** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PV =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| $27 000 | $25 000 | $21 000 | $17 000 | $17 000 |
| (1 + 0.08) | (1 + 0.08)2 | (1 + 0.08)3 | (1 + 0.08)4 | (1 + 0.08)5 |

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| --- | --- | --- | --- | --- | --- |
| **PV =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| $25 000 | $21 433 | $16 670 | $12 496 | $11 570 |

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| --- | --- |
| **PV =** | **$87 169** |

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| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $87 169 - | $80 000 |

|  |  |
| --- | --- |
| **NPV =** | **(+ve) $7 169** |

**Exercise 3.16**

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| **Investment Project A** |
| **Discount Rate – 8%** |

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| --- | --- | --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| $1 000 | $1 000 | $1 000 | $1 000 | $11 000 |

|  |  |
| --- | --- |
| **PV (Years 1 – 4) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Years 1 – 4) =** | $1 000 x PVF(8%, 4) |

|  |  |
| --- | --- |
| **PV (Years 1 – 4) =** | $1 000 x 3.3121 |

|  |  |
| --- | --- |
| **PV (Years 1 – 4) =** | **$3 312** |

|  |  |
| --- | --- |
| **PV (Year 5) =** | **NCF** |
| **(1 + i)n** |

|  |  |
| --- | --- |
| **PV (Year 5) =** | $11 000 |
| (1 + 0.08)5 |

|  |  |
| --- | --- |
| **PV (Year 5) =** | **$7 846** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | ($3 312 + $7 486) - | $10 000 |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $10 798 - | $10 000 |

|  |  |
| --- | --- |
| **NPV =** | **(+ve) $798** |

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| **Investment Project B** |
| **Discount Rate – 8%** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| $2 500 | $2 500 | $2 500 | $2 500 | $2 500 |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | $2 500 x PVF(8%, 5) |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | $2 500 x 3.9927 |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | **$9 981** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $9 981 - | $10 000 |

|  |  |
| --- | --- |
| **NPV =** | **(-ve) $19** |

|  |
| --- |
| **Investment Project C** |
| **Discount Rate – 8%** |

|  |  |
| --- | --- |
| **PV (Year 5) =** | **NCF** |
| **(1 + i)n** |

|  |  |
| --- | --- |
| **PV (Year 5) =** | $14 500 |
| (1 + 0.08)5 |

|  |  |
| --- | --- |
| **PV (Year 5) =** | **$9 868** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $9 868 - | $10 000 |

|  |  |
| --- | --- |
| **NPV =** | (-ve) $132 |

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| **Ranking** |
| Investment Project A |
| Investment Project B |
| Investment Project C |

|  |
| --- |
| **Investment Project A** |
| **Discount Rate – 10%** |

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| --- | --- | --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| $1 000 | $1 000 | $1 000 | $1 000 | $11 000 |

|  |  |
| --- | --- |
| **PV (Years 1 – 4) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Years 1 – 4) =** | $1 000 x PVF(10%, 4) |

|  |  |
| --- | --- |
| **PV (Years 1 – 4) =** | $1 000 x 3.1698 |

|  |  |
| --- | --- |
| **PV (Years 1 – 4) =** | $3 170 |

|  |  |
| --- | --- |
| **PV (Year 5) =** | **NCF** |
| **(1 + i)n** |

|  |  |
| --- | --- |
| **PV (Year 5) =** | $11 000 |
| (1 + 0.10)5 |

|  |  |
| --- | --- |
| **PV (Year 5) =** | **$6 830** |

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| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $3 170 + $6 830 - | $10 000 |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $10 000 - | $10 000 |

|  |  |
| --- | --- |
| **NPV =** | **0** |

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| **Investment Project B** |
| **Discount Rate – 10%** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| $2 500 | $2 500 | $2 500 | $2 500 | $2 500 |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | $2 500 x PVF(10%, 5) |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | $2 500 x 3.7907 |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | **$9 477** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $9 477 - | $10 000 |

|  |  |
| --- | --- |
| **NPV =** | **(-ve) $523** |

|  |
| --- |
| **Investment Project C** |
| **Discount Rate – 10%** |

|  |  |
| --- | --- |
| **PV (Year 5) =** | **NCF** |
| **(1 + i)n** |

|  |  |
| --- | --- |
| **PV (Year 5) =** | $14 500 |
| (1 + 0.10)5 |

|  |  |
| --- | --- |
| **PV (Year 5) =** | **$9 003** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

|  |  |  |
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| **NPV =**  | $9 003 - | $10 000 |

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| --- | --- |
| **NPV =** | **(-ve) $997** |

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| --- |
| **Ranking** |
| Investment Project A |
| Investment Project B |
| Investment Project C |

**Exercise 3.18**

|  |
| --- |
| **Fashion Bags** |

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| --- | --- |
| **Payback Period =** | **Initial Cost of Investment** |
| **Net Cash Flows** |

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| --- | --- |
| **Payback Period =** | $45 000 |
| $19 000 |

|  |  |
| --- | --- |
| **Payback Period =** | 2.37 |

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| --- | --- |
| **Payback Period =** | 0.37 x 12 = 4.44 |

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| --- | --- |
| **Payback Period =** | **2 Years and 5 Months** |

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| --- | --- |
| **PV (Years 1 – 6) =** | **NCF x PVF(i, n)** |

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| --- | --- |
| **PV (Years 1 – 6) =** | $19 000 x PVF(8%, 6) |

|  |  |
| --- | --- |
| **PV (Years 1 – 6) =** | $19 000 x 4.6229 |

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| --- | --- |
| **PV (Years 1 – 6) =** | **$87 835** |

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| --- | --- |
| **PV (Residual Value) =** | **NCF x PVF(i, n)** |

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| --- | --- |
| **PV (Residual Value) =** | $3 000 x PVF(8%, 6) |

|  |  |
| --- | --- |
| **PV (Residual Value) =** | $3 000 x 0.6302 |

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| --- | --- |
| **PV (Residual Value) =** | **$1 891** |

|  |  |
| --- | --- |
| **PV (Cost Of The Investment) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Cost Of The Investment) =** | $10 000 x PVF(8%, 1) |

|  |  |
| --- | --- |
| **PV (Cost Of The Investment) =** | $10 000 x 0.9259 |

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| --- | --- |
| **PV (Cost Of The Investment) =** | **$9 259** |

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| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

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| --- | --- | --- |
| **NPV =**  | ($87 835 + $1 891) - | ($45 000 + $9 259) |

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| --- | --- | --- |
| **NPV =**  | $89 726 - | $54 259 |

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| **NPV =** | **(+ve) $35 467** |

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| --- |
| **Fashion Belts** |

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| --- | --- |
| **Payback Period =** | **Initial Cost of Investment** |
| **Net Cash Flows** |

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| --- | --- |
| **Payback Period =** | $20 000 |
| $16 500 |

|  |  |
| --- | --- |
| **Payback Period =** | 1.21 |

|  |  |
| --- | --- |
| **Payback Period =** | 0.21 x 12 = 2.52 |

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| --- | --- |
| **Payback Period =** | **1 Year and 3 Months** |

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| **PV (Years 1 – 6) =** | **NCF x PVF(i, n)** |

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| --- | --- |
| **PV (Years 1 – 6) =** | $16 500 x PVF(8%, 6) |

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| --- | --- |
| **PV (Years 1 – 6) =** | $16 500 x 4.6228 |

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| --- | --- |
| **PV (Years 1 – 6) =** | **$76 276** |

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| **PV (Residual Value) =** | **NCF x PVF(i, n)** |

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| **PV (Residual Value) =** | $1 800 x PVF(8%, 6) |

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| **PV (Residual Value) =** | $1 800 x 0.6302 |

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| --- | --- |
| **PV (Residual Value) =** | **$1 134** |

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| **PV (Cost Of The Investment) =** | **NCF x PVF(i, n)** |

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| --- | --- |
| **PV (Cost Of The Investment) =** | $5 000 x PVF(8%, 2) |

|  |  |
| --- | --- |
| **PV (Cost Of The Investment) =** | $5 000 x 0.8573 |

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| --- | --- |
| **PV (Cost Of The Investment) =** | **$4 287** |

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| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

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| --- | --- | --- |
| **NPV =**  | ($76 276 + $1 134) - | ($20 000 + $4 287) |

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| --- | --- | --- |
| **NPV =**  | $77 410 - | $24 287 |

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| --- | --- |
| **NPV =** | **(+ve) $53 123** |

|  |
| --- |
| **Ranking** |
| Fashion Belts |
| Fashion Bags |

**Exercise 3.20**

**Requirement A**

|  |  |
| --- | --- |
| **Payback Period =** | **Initial Cost of Investment** |
| **Net Cash Flows** |

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| --- | --- |
| **Net Cash Flows =**  | **Cash Inflows – Cash Outflows** |

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| --- | --- |
| **Net Cash Flows =**  | $165 000 – $62 571 |

|  |  |
| --- | --- |
| **Net Cash Flows =**  | **$102 429** |

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| --- | --- |
| **Payback Period =** | $450 000 |
| $102 429 |

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| --- | --- |
| **Payback Period =** | 4.393 |

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| --- | --- |
| **Payback Period =** | 0.393 x 12 = 4.71 |

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| **Payback Period =** | **4 Years and 5 Months** |

**Requirement B**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **NCF =** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** |
| $102 429 | $102 429 | $102 429 | $102 429 | $102 429 | $102 429 | $102 429 + $20 000 = $122 429 |

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| --- | --- |
| **PV (Years 1 – 6) =** | **NCF x PVF(i, n)** |

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| --- | --- |
| **PV (Years 1 – 6) =** | $102 429 x PVF(6%, 6) |

|  |  |
| --- | --- |
| **PV (Years 1 – 6) =** | $102 429 x 4.9173 |

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| --- | --- |
| **PV (Years 1 – 6) =** | **$503 675** |

|  |  |
| --- | --- |
| **PV (Year 7) =** | **NCF x PVF(i, n)** |

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| --- | --- |
| **PV (Year 7) =** | $122 429 x PVF(6%, 7) |

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| **PV (Year 7) =** | $122 429 x 0.6651 |

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| --- | --- |
| **PV (Year 7) =** | **$81 428** |

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| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

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| --- | --- | --- |
| **NPV =**  | ($503 675 + $81 428) - | $450 000 |

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| --- | --- | --- |
| **NPV =**  | $585 103 - | $450 000 |

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| **NPV =** | **(+ve) $135 103** |

**Exercise 3.22**

**Requirement A**

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| --- |
| **French Café** |

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| **Depreciation (Straight-Line Method)** | ($400 000 - $14 000)/6 Years = | **$64 333 Per Year** |

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| **Net Cash Flows (Years 1 – 6) =**  | **Cash Inflows – Cash Outflows** |

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| --- | --- |
| **Net Cash Flows (Years 1 – 6) =**  | $340 000 – ($270 000 - $64 333) |

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| --- | --- |
| **Net Cash Flows (Years 1 – 6) =**  | $340 000 – $205 667 |

|  |  |
| --- | --- |
| **Net Cash Flows (Years 1 – 6) =**  | **$134 333** |

|  |  |
| --- | --- |
| **Payback Period =** | **Initial Cost of Investment** |
| **Net Cash Flows** |

|  |  |
| --- | --- |
| **Payback Period =** | $400 000 |
| $134 333 |

|  |  |
| --- | --- |
| **Payback Period =** | 2.978 |

|  |  |
| --- | --- |
| **Payback Period =** | 0.978 x 12 = 11.74 (12 Months) |

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| --- | --- |
| **Payback Period =** | **3 Years** |

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| --- | --- |
| **PV (Years 1 – 5) =** | **NCF x PVF(i, n)** |

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| --- | --- |
| **PV (Years 1 – 5) =** | $134 333 x PVF(12%, 5) |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | $134 333 x 3.6048 |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | **$484 244** |

|  |  |
| --- | --- |
| **PV (Year 6) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Year 6) =** | ($134 333 + $14 000) x PVF(12%, 6) |

|  |  |
| --- | --- |
| **PV (Year 6) =** | $148 333 x 0.5066 |

|  |  |
| --- | --- |
| **PV (Year 6) =** | **$75 146** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

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| --- | --- | --- |
| **NPV =**  | ($484 244 + $75 146) - | $400 000 |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $559 390 - | $400 000 |

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| **NPV =** | **(+ve) $159 390** |

|  |
| --- |
| **Turkish Cafe** |

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| --- | --- | --- |
| **Straight-Line Method** | ($300 000 - $10 000)/7 Years = | **$41 429 Per Year** |

|  |
| --- |
| **Accumulated Cash Flows** |
| **Year** | **Cash Inflows** | **Cash Outflows** | **Net Cash Flows** | **Accumulated Cash Flows** |
| 1 | $290 000 | $250 000 - $41 429 = $208 571 | $81 429 | $81 429 |
| 2 | $290 000 | $250 000 - $41 429 = $208 571 | $81 429 | $162 858 |
| 3 | $290 000 | $250 000 - $41 429 = $208 571 | $81 429 | **$244 287** |
| 4 | $290 000 | $250 000 - $41 429 = $208 571 | **$81 429** | **$325 716** |
| 5 | $290 000 | $250 000 - $41 429 = $208 571 | $81 429 | $407 145 |
| 6 | $390 000 | $250 000 - $41 429 = $208 571 | $181 429 | $588 574 |
| 7 | $390 000 | $250 000 - $41 429 = $208 571 | $181 429 | $770 003 |

|  |  |  |
| --- | --- | --- |
| **Step 1** | Calculate the cumulative cash flows for each year. | At the end of **Year 3** we have accumulated **$244 287** and at the end of **Year 4** we accumulated **$325 716**. The initial investment is recovered after **Year 3** but before the completion of **Year 4**. |

|  |  |  |  |
| --- | --- | --- | --- |
| **Step 2** | Determine the amount still to be recovered after **Year 3**. | $300 000 - $244 287 | = $55 713 |

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| --- | --- | --- | --- |
| **Step 3** | Calculate the proportion of the amount to be recovered is of the total to be recovered in **Year 4**. | $55 173$81 429 | = 0.684 |

|  |
| --- |
| This proportion can be expressed in months as follows: |

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| --- | --- |
| **Payback Period =** | 0.684 x 12 months = 8.21 (9 Months) |

|  |  |
| --- | --- |
| **Payback Period =** | **3 Years and 9 Months** |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | $81 429 x PVF(12%, 5) |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | $81 429 x 3.6048 |

|  |  |
| --- | --- |
| **PV (Years 1 – 5) =** | **$293 536** |

|  |  |
| --- | --- |
| **PV (Year 6) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Year 6) =** | $181 429 x PVF(12%, 6) |

|  |  |
| --- | --- |
| **PV (Year 6) =** | $181 429 x 0.5066 |

|  |  |
| --- | --- |
| **PV (Year 6) =** | **$91 912** |

|  |  |
| --- | --- |
| **PV (Year 7) =** | **NCF x PVF(i, n)** |

|  |  |
| --- | --- |
| **PV (Year 7) =** | ($181 429 + $10 000) x PVF(12%, 7) |

|  |  |
| --- | --- |
| **PV (Year 7) =** | $191 429 x 0.4523 |

|  |  |
| --- | --- |
| **PV (Year 7) =** | **$86 584** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | **PV Net Cash Flows -** | **PV Of The Cost Of The Investment** |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | ($293 536 + $91 912 + $86 584) - | $300 000 |

|  |  |  |
| --- | --- | --- |
| **NPV =**  | $472 032 - | $300 000 |

|  |  |
| --- | --- |
| **NPV =** | **(+ve) $172 032** |

**Requirement B**

The Turkish Café has the higher risk attached to it due to a longer Payback Period of 3 Years and 9 Months, compared with 3 Years for the French Café.

**Requirement C**

Not Applicable

**Requirement D**

Using the Net Present Value figures to rank the cafes, the Turkish Café is ranked higher with $172 047 when compared to $159 395 of the French Café. This is the opposite result when comparing the Payback Period results.