A1. Rick

1. Which of the following formulae for ARR is correct?

C: Correct

2. Which of the following statements is true?

C: Correct (650-300)

3. Which of the following statements is true?

C: Correct (1500-200)/4)

4. Average annual profit for the four years will be:

C: Correct ((350-325) + (550 -325) + (550-325) + (650-325))/2

5. What is the average amount invested in the project?

A: Correct (1500+200)/2 = £850

6. What is the Accounting Rate of Return?

C: Correct (200/850)

7. Which of the following statements regarding payback period, is true?

D: Correct

8. In calculating the payback period what is the cumulative cash flow after year 1?

D: Correct (-1500+350)

9. In calculating the payback period what is the cumulative cash flow after year 2?

C: Correct (-1500+350+350)

10. What is the Payback Period to the nearest month?

C: Correct (3 years plus 50/650 x 12 months)

11. Which of the following is true?

A: Correct

12. Using the NPV method and a discount factor of 10% what would be the present value adjustment required for the cash flows arising at the start of the project and at the end of year one?

A: Correct

13. Using a discount factor of 10% what would be the cash flow using the NPV method in year 1?

B: Correct (350/1.1)

14. Using a discount factor of 10% what would be the present value of the cash flow arising in year 2?

C: Correct (550/(1.1x1.1) or 550 x 0.83)

15. What is the Net Present Value of the Project?

C: Correct (-1,500 +318+456+413+443)

16. Which of the following statements is true?

C: Correct

A2. Skips Lite Lunches accounting rate of return

To calculate the accounting rate of return

Accounting rate of return—recycling machine		
Depreciation per annum = (£12,500 − £1,500) / 4 = £2,750		
Year 1	Operating profit after depreciation (£2,500 – 2,750)	-£250
Year 2	Operating profit after depreciation (£3,500 – £2,750)	£750
Year 3	Operating profit after depreciation (£4,500 – £2,750)	£1750
Year 4	Operating profit after depreciation (£5,000 – £2,750)	£ 2,250

Accounting rate of return—recycling machine		
Depreciation per annum = (£12,500 − £1,500) / 4 = £2,750		
	Average for the four years	**£1,125**

The average amount invested in the project = (£12,500 + £1,500)/2

= £7,000

Accounting rate of return (ARR) **=** 1,125 / 7,000 **×** 100 **=** 16%

A3. Skips Lite Lunches payback period

To find the payback period:

	Cash inflow/(outflow) £	**Cumulative cash flow £**
At start	(12,500)	(12,500)
After one year	2,500	(10,000)
After two years	3,500	(6,500)
After three	4,500	(2,000)

	Cash inflow/(outflow) £	**Cumulative cash flow £**
years		
After four years	5,000+1,500	4,500

The payback period will be between three and four years:

Payback period = 3 years + 2,000/6,500 x 12 months = 3 years and 4 months

A4. Skips Lite Lunches net present value

To find the net present value at 12%:

Time		**Cash flows £**	**Discount factor (15%)**	**PV £**
At start	Initial costs	(12,500)	1	(12,500)
After one year	Net cash flow	2,500	0.89	2,225
After two years	Net cash flow	3,500	0.80	2,800
After three	Net cash flow	4,500	0.71	3,195

Time		**Cash flows £**	**Discount factor (15%)**	**PV £**
years				
After four years	Net cash flow	6,500	0.64	4,160
NPV				**(120)**

A5. Skips Lite Lunches decision making

Advice:

Payback on the project is more than 3 years and the project has an accounting rate of return of 16%, however net present value on the project is -£120. Net present value is the best method of investment appraisal and from these results it would not seem particularly beneficial in financial terms to consider proceeding with this project. If the company required the project to generate returns of 12%, then the NPV would be close to zero and the project would not be worthwhile undertaking. There could, of course, be other factors that might influence the decision:

- The venture fits with Skip's ethos for his organization to be environmentally friendly and behave in a socially responsible manner.
- The new environmentally friendly profile may mean that Skips attracts new customers.
- The new environmentally friendly business may attract good publicity.

A6. 3D printer Accounting Rate of Return

To calculate the accounting rate of return

Accounting rate of return—3D printer machine		
Depreciation per annum = (£37,500 − £2,500) / 5 = £7,000		
Year 1	Operating profit after depreciation (£8,200 – 7,000)	£1,200
Year 2	Operating profit after depreciation (£9,200 – £7,000)	£2,200
Year 3	Operating profit after depreciation (£10,500 – £7,000)	£3,500
Year 4	Operating profit after depreciation (£15,000 – £7,000)	£8,000
Year 5	Operating profit after depreciation (£15,000 – £7,000)	£8,000
	Average for the five years	**£4,580**

The average amount invested in the project = (£37,500 + £2,500)/2

= £20,000

Accounting rate of return (ARR) **=** 4,580 / 20,000 **×** 100 **=** 23%

A7. 3D printer payback period

To find the payback period:

	Cash inflow/(outflow) **£**	**Cumulative cash flow** **£**
At start	(37,500)	(37,500)
After one year	8,200	(29,300)
After two years	9,200	(20,100)
After three years	10,500	(9,600)
After four years	15,000	5,400
After five years	15,000 +2,500	22,900

The payback period will be between three and four years:

Payback period = 3 years + 5,400/15,000 x 12 months = 3 years and 4 months

A8. 3D printer Net Present Value

To find the net present value at 8%:

Time		**Cash flows £**	**Discount factor (7%)**	**PV £**
At start	Initial costs	(37,500)	1	(37,500)
After one year	Net cash flow	8,200	.93	7,626
After two years	Net cash flow	9,200	.87	8,004
After three years	Net cash flow	10,500	.82	8,610
After four	Net cash flow	15,000	.76	11,400

Time		**Cash flows £**	**Discount factor (7%)**	**PV £**
years				
After five years	Net cash flow	15,000	.71	10,650
NPV				**8,790**

Advice:

Payback on the project is more than 3 years and the project has an accounting rate of return of 57% and the net present value on the project is £8,790. These would all suggest that it would be beneficial in financial terms to consider proceeding with this project.