Capital Budgeting

Practice Problems

1) L Company is considering two new machines that should produce considerable cost savings in its assembly operations. The cost of each machine is $14,000 and neither is expected to have a salvage value at the end of a 4-year useful life. L Company's required rate of return is 12% and the company prefers that a project return its initial outlay within the first half of the project's life. The annual after-tax cash savings for each machine are provided in the following table:

Year	Machine A	Machine B
1	$5,000	$8,000
2	$5,000	$6,000
3	$5,000	$4,000
4	$5,000	$2,000
Total	**$20,000**	**$20,000**

Required: a) Compute the payback period for each machine
b) Compute the net present value for each machine.
c) Which machine should be purchased? The Company should invest in Machine B as it has higher NPV (+2,044) as compared to Machine A. Secondly, the payback period of Machine B is exactly 2 years which is lower than SPB of Machine A. Further, Machine B also fulfills the requirement of payback period which the Company prefers to be recovered in first half of project life.

2) B Company is considering purchasing equipment that costs $235,000. The equipment has an estimated useful life of 5 years and no salvage value. B Company believes that the annual cash inflows from using the equipment will be $65,000.

Required: a) Calculate the net present value of the equipment assuming that B Company's cost of capital is 12%. Is the equipment an acceptable investment?

b) Calculate the net present value of the equipment assuming that B Company's cost of capital is 10%. Is the equipment an acceptable investment?

3) C Company is investigating four different opportunities. Information on the four projects under study is as follows:

	Project 1	Project 2	Project 3	Project 4
Investment required	$480,000	$360,000	$270,000	$450,000
Present value of cash inflows	$567,270	$433,400	$336,140	$522,970
Net present value	$87,270	$73,400	$66,140	$72,970
Life of project	6 years	12 years	6 years	3 years

The company's required rate of return is 10%; therefore a 10% discount rate has been used in the present value computations above. Limited funds are available for investment, so the company cannot accept all of the available projects.

Required: a) Compute the profitability index for each investment project.

b) Rank the four projects according to preference, in terms of:

- Net present value
- Present value index

4) S Company is considering the purchase of a new piece of equipment for laying sod. Relevant information concerning the equipment follows:

Cost of the equipment (Initial Investment)	$180,000
Annual cost savings from new equipment (CFs)	$37,500
Life of the new equipment	12 years
Expected Annual Net Income	$15,000

Required: a) Compute the payback period for the equipment. If the company requires a payback period of four years or less, would the equipment be purchased?

No, the equipment will not be purchased because the payback period is 4.80 years which is more than the requirement period of S Company.

5) Eldon Windows Inc. has $80,000 capital budget and has the opportunity to invest in five different projects. The initial investment and NPV of the projects is shown below:

Projects	Investment Outlay	NPV
A	$45,000	$18,000
B	$40,000	$16,000
C	$20,000	$9,000
D	$18,000	$8,000
E	$15,000	$4,000

In which combination of projects should Eldon Windows invest?

Multiple Choice Questions

1) An asset costs $210,000 with a $30,000 salvage value at the end of its ten-year life. If annual cash inflows are, the cash payback period is

a) 8 years. $30,000

b) 7 years.

c) 6 years.

d) 5 years.

2) B Company is considering the purchase of a piece of equipment that costs $23,000. Projected net annual cash flows over the project's life are:

Year	Net Annual Cash Flow
1	$3,000
2	8,000
3	15,000
4	9,000

The cash payback period is:

a) 2.63 years.

b) 2.80 years.

c) 2.37 years.

d) 2.20 years.

3) If a company's required rate of return is 10% and, in using the net present value method, a project's net present value is zero, this indicates that the

a) Project's rate of return exceeds 10%.
b) Project's rate of return is less than the minimum rate required.
c) Project earns a rate of return of 10%.
d) Project earns a rate of return of 0%.

4) When a capital budgeting project generates a positive net present value, this means that the project earns a return higher than the

a) Internal rate of return.
b) Annual rate of return.
c) Required rate of return.
d) Present value index

5) The present value index is computed by dividing the

a) Total cash flows by the initial investment.
b) Present value of cash flows by the initial investment.
c) Initial investment by the total cash flows.
d) Initial investment by the present value of cash flows.

6) S Company recently invested in a project with a 3-year life span. The initial investment was $15,060 and annual cash inflows were $7,000 for year 1; $8,000 for year 2; and $9,000 for year 3. The company expects a 15% required rate of return, information related to that is presented below. What is the net present value for the project?

a) $15,264.

b) $3,000.

c) $9,744.

d) $12,000.

7) Given the following cash flows for a capital project, calculate its payback period and discounted payback period. The required rate of return is 8 percent. The discounted payback period is

Year	**0**	**1**	**2**	**3**	**4**	**5**
Cash flow($)	–50,000	15,000	15,000	20,000	10,000	5,000

A. 0.16 years longer than the payback period.

B. 0.80 years longer than the payback period.

C. 1.01 years longer than the payback period.

D. 1.85 years longer than the payback period.

8) An investment of $ 100 generates after - tax cash flows of $ 40 in year 1, $ 80 in year 2, and $120 in year 3. The required rate of return is 20 percent. The net present value is closest to

A. $42.22.
B. $58.33.
C. $68.52.
D. $98.95.

9) Kim Corporation is considering an investment of 750 million won with expected after - tax cash inflows of 175 million won per year for seven years. The required rate of return is 10 percent. Expressed in years, what are the project ' s payback and discounted payback periods?

	Payback Period	Discounted Payback Period
A.	4.3	5.4
B.	4.3	5.9
C.	4.8	5.4
D.	4.8	5.9

10) An investment of $ 20,000 will create a perpetual after - tax cash flow of $ 2,000. The required rate of return is 8 percent. What is the investment ' s profitability index?

A. 1.00.
B. 1.08.
C. 1.16.
D. 1.25.

11) Hermann Corporation is considering an investment of € 375 million with expected after - tax cash inflows of € 115 million per year for seven years and an additional after - tax salvage value of € 50 million in year 7. The required rate of return is 10 percent. What is the investment's PI?

A. 1.19.
B. 1.33.
C. 1.56.
D. 1.75.

12) Projects 1 and 2 have similar outlays, although the patterns of future cash flows are different. The cash flows, along with the NPV and IRR for the two projects, are shown in the following table. For both projects, the required rate of return is 10 percent. The two projects are mutually exclusive. What is the appropriate investment decision?

Cash Flows						**NPV**	**IRR**
Year	**0**	**1**	**2**	**3**	**4**		
Project 1	50	20	20	20	20	13.40	21.86 %
Project 2	50	0	0	0	100	18.30	18.92 %

A. Invest in Project 1 because it has the higher IRR.

B. Invest in Project 2 because it has the higher NPV.

C. Invest half in each project.

D. Invest in both projects.

The following information is used for Questions 13, 14, and 15.
McConachie Company is considering the purchase of a new 400-ton stamping press. The press costs $360,000, an additional $40,000 is needed to install it. The press will be depreciated straight-line to 0 over a five-year life. The press will generate no additional revenues, but it will reduce cash operating expenses by $140,000 annually. The press will be sold for $120,000 after five years. An inventory investment of $60,000 is required during the life of the investment. McConachie is in the 40% tax bracket.

13. What is McConachie ’ s net investment outlay?
A. $ 360,000. B. $ 400,000. C. $ 420,000. D. $ 460,000.

14. McConachie’s annual after-tax operating cash flow is closest to
A. $ 116,000. B. $ 124,000. C. $ 140,000. D. $ 164,000.

15. What is the terminal year’s after-tax non operating cash flow at the end of year 5?
A. $ 108,000. B. $ 129,000. C. $ 132,000. D. $ 180,000.