Short-Answer

1. Blastoff Shoes is considering building a new retail store in Waco on land that it already owns. Should the cost of the land where the store will be located be included as part of the incremental earnings of the proposed new store ("yes" or "no" is all that is needed to answer this question)?

    No

2. Games Galore is considering building a new assembly plant in Central Texas. Games Galore has already calculated the plant's unlevered net income and is now attempting to calculate its free cash flow. Using the following estimates, calculate the impact of working capital on the plant's free cash flow for the 3rd year of operation if Game Galore's marginal tax rate is 35%.

Year	0	1	2	3	4	5
Cash	5	6	8	9	10	11
Accounts receivable	0	30	32	35	37	40
Inventory	100	120	130	135	140	140
Accounts payable	50	70	75	80	82	85
Net Working Capital	55	86	95	99	105	106

    ΔNWC = 99 – 95
    FCF = – ΔNWC

3. Water 'R Us Inc. has just spent $100,000 to purchase equipment that falls into the ten-year MACRS property class. If Water R' Us' marginal tax rate is 35%, calculate the impact of deprecation on the firm's unlevered net income during the third year of the equipment's life. Note: write a "+" to indicate a positive impact and a "–" to indicate a negative impact.

    $-100,000 \times .1440 \times (1-.35)$

4. Blastoff Shoes is considering building a new retail store in Waco. Blastoff estimates that some of the sales at the new store will come from customers who would have driven to their existing store in Temple. How should the loss of sales at the existing Temple store be factored into the incremental earnings of the proposed new store?

    Subtract the sales lost from the Temple store from the sales in the new Waco store.

5. Games Galore is considering building a new assembly plant in Central Texas. Games Galore has already calculated the plant's unlevered net income and is now attempting to calculate its free cash flow. Using the following estimates, calculate the impact of working capital on the plant's free cash flow for the 2nd year of operation if Game Galore's marginal tax rate is 35%.

Year	0	1	2	3	4	5
Cash	5	6	8	9	10	11
Accounts receivable	0	30	32	35	37	40
Inventory	100	120	130	135	140	140
Accounts payable	50	70	75	80	82	85
Net Working Capital	55	86	95	99	105	106

    ΔNWC = 95 – 86
    FCF = – ΔNWC

6. Office Systems Inc. has just spent $10,000 to purchase new furniture that falls into the seven-year MACRS property class. Assuming that Office System's marginal tax rate is 35%, calculate the impact of the furniture's depreciation on the firm's free cash flow in the fourth year of the furniture's life. Note: write a "+" to indicate a positive impact and a "–" to indicate a negative impact.

(-10,000 × .1249)(1-.35) + 10,000 × .1249 (Note: using 7.5b)
+10,000 × .1249 × .35 (Note: using 7.6)

7. Blastoff Shoes is considering building a new retail store in Waco on land that it already owns. The land has a historic home on it that will have to be moved before the store can be built. Should the cost of moving the house currently on the land where the store will be located be included as part of the incremental earnings of the proposed new store ("yes" or "no" is all that is needed to answer this question)?

Yes

8. Transport Taxi has purchased a new cab for $35,000. The cabs falls into the five-year MACRS property class. Calculate the impact of the taxi's depreciation on the firm's free cash flow in its second year of operation if Transport Taxi's marginal tax rate is 35%. Note: write a "+" to indicate a positive impact and a "–" to indicate a negative impact.

(-35,000 × .32)(1-.35) + 35,000 × .32 (Note: using 7.5b)
+35,000 × .32 × .35 (Note: using 7.6)

Use the following information to answer short-answer questions 9 and 10. For both questions use a "+" to indicate an increase (inflow) and a "-" to indicate a decrease (outflow).

Jelda Systems Inc is considering purchasing machinery this year for $50 million. The machinery will be depreciated by $10 million per year for 5 years beginning next year. Jelda's marginal tax rate is 35%.

9. How will the cost of the machinery impact Jelda's earnings this year and next year?

0; -10(1-.35)

10. How will the cost of the machinery impact Jelda's cash flow this year and next year?

-50; +10(.35)

Problems

1. Toyonda Motors is considering building a new assembly plant in Waco and has estimated the following for the new plant:

   Sales per year will equal $100 million beginning a year from today.
   Sales will grow by 10% per year for 5 years (after the initial sales).
   Cost of goods sold will equal 60% of sales.
   Fixed manufacturing costs (excluding depreciation) will equal $10 million per year starting a year from today.
   Depreciation will equal $3 million per year.
   Capital spending will equal $4 million per year.
   Net working capital will equal 25% of sales.
   Toyonda's marginal tax rate is 35%

   a. Calculate Toyonda's unlevered net income two years from today.
   b. Calculate Toyonda's free cash flow two years from today.

   a. $UNI_2 = (R_2 - E_2 - 3)x(1 - .35)$
      $R_2 = 100(1.1)$
      $E_2 = .6(R_2) + 10$

   b. $FCF_2 = UNI_2 + 3 - 4 - \Delta NWC$
      $\Delta NWC = NWC_2 - NWC_1$
      $NWC_2 = .25(R_2)$
      $NWC_1 = .25(100)$

2. Toyonda Motors is considering building a new assembly plant in Waco and has estimated the following for the new plant:

   Sales per year will equal $100 million per year starting a year from today.
   Cost of goods sold will equal $60 million per year starting a year from today.
   Fixed manufacturing costs (excluding depreciation) will equal $10 million per year starting a year from today.
   The new plant will cost $20 million to build and will depreciated at a rate of $2 million per year over 10 years starting a year from today.
   Net working capital will equal $15 million today, $25 million a year from today, and $30 million two years from today (and later).
   Toyonda's marginal tax rate is 35%
   Toyonda's cost of capital is 9%.

   What is Toyonda's Free Cash Flow two years from today?

   $FCF_2 = (100 - 60 - 10 - 2)(1-.35) + 2 - 0 - (30 - 25)$

3. Use the following information to calculate the project's expected unlevered net income and free cash flow **three years from today**.

Your firm is considering investing $10,000,000 in a project that will be depreciated using the MACRS depreciation method for 3-year property. The investment would occur today and the project will produce its first sales of $3,000,000 a year from today. After these initial sales, sales are expected to grow by 15% per year through five years from today and then by 4% per year for the rest of the project's life. Cost of goods sold for the project is expected to equal 70% of sales. If your firm invests in the project, then beginning one year from today, $550,000 per year will be paid in salaries to the new personnel hired for the project, and $150,000 per year of the salaries of current employees already working at the firm's home office (the CEO, etc.) will be allocated to the project. The project will be built on land that cost $2,000,000 to acquire a year ago that could be sold today for $1,100,000. The firm's marginal tax rate is 35%. If the firm undertakes the project, then the increase in the firm's current assets and current liabilities (compared to if the project is not undertaken) at the end of years 0 (today) through 4 equal:

	Year 0	Year 1	Year 2	Year 3	Year 4
Cash	15,000	35,000	45,000	50,000	57,000
Inventory	700,000	750,000	850,000	1,000,000	1,100,000
Accounts Receivable	0	800,000	900,000	1,200,000	1,250,000
Accounts Payable	300,000	450,000	600,000	650,000	550,000

$NWC_3 = 50,000 + 1,000,000 + 1,200,000 - 650,000$
$NWC_2 = 45,000 + 850,000 + 900,000 - 600,000$
$\Delta NWC_3 = NWC_3 - NWC_2$

$UNI_3 = (R_3 - E_3 - D_3)(1 - T_C)$
  $R_3 = 3,000,000(1.15)^2$
  $E_3 = .7(R_3) + 550,000$
  $D_3 = 10,000,000(.1481)$
  $T_C = .35$

$FCF_3 = UNI_3 + D_3 - CE_3 - \Delta NWC_3$
  $CE_3 = 0$

4. Use the following information to calculate the project's expected free cash flow **today** and **four years from today**.

Your firm is considering investing $5,000,000 in a project that will be depreciated using the MACRS depreciation method for 5-year property. The investment would occur today and the project will produce its first sales of $2,000,000 a year from today. After these initial sales, sales are expected to grow by 20% per year through five years from today and then by 3% per year for the rest of the project's life. Cost of goods sold for the project is expected to equal 60% of sales. If your firm invests in the project, $350,000 per year will be paid in salaries to the new personnel hired for the project, and $100,000 per year of the salaries of current employees already working at the firm's home office (the CEO, etc.) will be allocated to the project. The project will be built on land that cost $1,000,000 to acquire a year ago that could be sold today for $800,000. The firm's marginal tax rate is 35%. If the firm undertakes the project, then the increase in the firm's current assets and current liabilities (compared to if the project is not undertaken) at the end of years 0 (today), 1, 3, 4, and 5 equal:

	Year 0	Year 1	Year 3	Year 4	Year 5
Cash	10,000	25,000	25,000	30,000	37,000
Inventory	600,000	600,000	700,000	850,000	1,100,000
Accounts Receivable	0	400,000	500,000	600,000	725,000
Accounts Payable	250,000	250,000	300,000	350,000	450,000

$FCF_0 = 0 - 5,000,000 - (800,000 - (800,000 - 1,000,000)(.35)) - (10,000 + 600,000 - 250,000)$
$FCF_4 = (S_4 - .6S_4 - 350,000 - D_4)(1 - .35) + D_4 - 0 - \Delta NWC_4$
$S_4 = 2,000,000(1.2)^3$
$D_4 = .1152(5,000,000)$
$\Delta NWC_4 = (30,000 + 850,000 + 600,000 - 350,000) - (25,000 + 700,000 + 500,000 - 300,000) = 205,000$

5. Your firm is deciding whether or not to build a new umbrella factory. The factory will cost $500,000 to build today and will be depreciated over a 7-year recovery period using MACRS depreciation. You will sell the production of the factory once per year (just before rainy season) and you expect your first sales of $800,000 will occur one year from today. After these initial sales, you expect sales to grow by 6% per year over the life of the factory. You estimate that operating expenses other than depreciation will equal 60% of sales. You expect that the project will require an investment in net working capital of $150,000 today. Net working capital will increase by 5% per year. Assume that the firm's marginal tax rate is 35%. What is the firm's marginal incremental free cash flow _five_ years from today?

$R_5 = 800,000(1.06)^4$
$E_5 = .6R_5$
$D_5 = .0893(500,000)$
$NWC_4 = 150,000(1.05)^4$
$NWC_5 = 150,000(1.05)^5$
$\Delta NWC = NWC_5 - NWC_4$
$T_C = .35$
$CE = 0$
$UNI = (R - E - D)(1 - Tc)$ and $FCF = UNI + D - CE - \Delta NWC$
or $FCF = (R - E)(1 - Tc) - CE - \Delta NWC + Tc(D)$
or $FCF = (R - E - D)(1 - Tc) + D - CE - \Delta NWC$

6. aTiT Phones is considering building a new factory for $3,000,000 to produce aPhones. The new factory would be depreciated on a straight-line basis of $600,000 per year for each of the next 5 years (starting next year). Expected sales of aPhones are expected to vary by year as follows: 1st year = $4,000,000; 2nd year = $5,000,000; 3rd year = $5,500,000; 4th year = $4,500,000; and 5th year = $2,500,000. Production costs are expected to equal 75% of sales. Inventory is expected to equal 15% of each year's sales and accounts payable are expected to equal 5% of each year's sales. aTiT's cost of capital is 14% and its tax rate is 35%. What is the factory's free cash flow four years from today (during the 4th year)?

$$FCF_4 = (R_4 - C_4 - D_4)(1 - \tau_C) + D_4 - CE_4 - \Delta NWC$$
$$\Rightarrow FCF_4 = (4{,}500{,}000 - .75(4{,}500{,}000) - 600{,}000)(1 - .35) + 600{,}000 - 0 - \Delta NWC$$
$$\Delta NWC = NWC_4 - NWC_3$$
$$NWC_4 = .15(4{,}500{,}000) - .05(4{,}500{,}000)$$
$$NWC_3 = .15(5{,}500{,}000) - .05(5{,}500{,}000)$$

Multiple-Choice

Use the following information to answer questions 1 through 4.

    Your firm is considering investing $5,000,000 in a project that will fall into the 7-year MACRS class. The investment would occur today and the project will produce its first sales of $2,000,000 one year from today. Sales are expected to grow by 20% per year through five years from today and then by 3% per year for the rest of the project's life. Cost of goods sold for the project is expected to equal 65% of sales. If your firm invests in the project, $100,000 per year of the costs associated with current employees at the firm's home office (the CEO, etc.) will be allocated to the project and $350,000 per year will be spent on new personnel hired for the project. The project will be built on land that cost $1,000,000 to acquire a year ago that could be sold today for $800,000. The firm's marginal tax rate is 35%. If the firm undertakes the project, then the current assets and current liabilities associated with the project at the end of years 2, 3, and 4 equal:

	Year 2	Year 3	Year 4
Cash	25,000	30,000	37,000
Inventory	700,000	850,000	1,100,000
Accounts Receivable	500,000	600,000	725,000
Accounts Payable	300,000	350,000	450,000

1. Assume you want to calculate the project's unlevered net income **three** years from today. What would you use for D?
   A. 874,500
   b. 740,500
   c. 306,075
   d. 1,224,500
   e. 624,500

2. Assume you want to calculate the project's unlevered net income **three** years from today. What would you use for
   τ_c?
   a. 0.20
   b. 0.65
   c. 0.00
   D. 0.35
   e. none of the above

3. How does net working capital impact free cash flow **three** years from today?
   a. -162,500
   b. +205,000
   c. +282,000
   D. -205,000
   e. -282,000

4. Assume you want to calculate the project's unlevered net income **three** years from today. What would you use for R?
   a. 2,400,000
   B. 2,880,000
   c. 2,000,000
   d. 3,456,000
   e. none of the above