

Engineering Economics

ECO 1192C

Second Mid-Term Examination (White)

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Winter 2015

35 Multiple Choice Questions

1. An 80-minute examination with 35 multiple-choice questions.
2. One (1) point for correct answers; zero (0) for incorrect answers.
3. The Scantron sheet with your answers must be submitted as you leave the examination room.
4. Darken the appropriate ovals on the Scantron sheet for your name, student number, course number and answers.
5. Calculators are permissible during this examination.
6. Please leave your student ID card visible at all times.
7. Please keep the questionnaire for future reference as the answer key will be posted on the course website within 24 hours following the examination.

1. Which of the following answers is a reason why businesses should track as accurately as possible the depreciation of its capital assets?
- a) Make sound replacement decisions.
 - b) Maximise revenues.
 - c) Maximise income tax liabilities
 - d) All of the above answers.
2. A capital asset's annual economic depreciation is defined as
- a) its purchase price less its total depreciation.
 - b) its current market value less its total depreciation.
 - c) its market value at the end of a year less its market value at the beginning of the same year.
 - d) None of these answers.
3. The focus of government projects is to
- a) maximise economic well-being (welfare).
 - b) maximise profits
 - c) minimise costs.
 - d) maximise equity.
4. Which of the following statement is true?
- a) Higher depreciation charges lead to higher taxable income which leads to lower tax liabilities which lead to lower after-tax cash flows.
 - b) Lower depreciation charges lead to lower taxable income which leads to lower tax liabilities which lead to lower after-tax cash flows.
 - c) Higher depreciation charges lead to higher taxable income which leads to higher tax liabilities which lead to higher after-tax cash flows.
 - d) Higher depreciation charges lead to lower taxable income which leads to lower tax liabilities which lead to higher after-tax cash flows.
 - e) None of these answers.
5. Economic life is defined as the period of time between the date of purchase of an asset and the date
- a) it was scrapped.
 - b) of its first major overhaul.
 - c) of its replacement at any point in its life.
 - d) of its replacement to minimize asset-related costs.
6. The half-year rule was introduced by the Government of Canada to
- a) foster business investments in physical (fixed) assets.
 - b) reduce the income tax burden of businesses with significant income from operations.
 - c) reduce the tax advantage arising from the purchase of capital assets at yearend.
 - d) None of these answers.
7. Annual depreciation charges are _____ cash flows while annual income taxes on profits are _____ cash flows.
- a) Explicit; implicit

- b) Implicit; explicit
- c) None of these answers.

QUESTIONS 8 to 9

Project	First Cost (M\$)	Individual B-C Ratios	INCREMENTAL B-C RATIOS			
			A	B	C	D
A	250	1.5				
B	300	1.3	1.2			
C	350	0.9	0.8	0.9		
D	450	1.2	1.1	1.1	1.2	
E	600	1.1	1.0	1.0	0.9	1.1

8. If Projects A, B, C, D and E are independent, valid projects are:
- a) All projects.
 - X b) A, B, C and E.
 - c) A, B, D and E.
 - d) A, B, C and D.
9. If Projects A, B, C, D and E are mutually exclusive, which project (if any) is best?
- a) A
 - X b) C
 - c) D
 - d) E

QUESTIONS 10 TO 14

1. Your company purchased new equipment on January 1, 2013.
2. You were informed today (January 1, 2015) that better performing equipment is now available.
3. Detailed information on the existing (old) and new equipment is provided below.
4. MARR = 10%.

<u>Details</u>	<u>Defender</u>	<u>Challenger (new)</u>
First Cost(\$)	300,000 (January 1, 2013)	350,000 (January 1, 2015)
Market Value (\$)	200,000 (January 1, 2015)	350,000 (January 1, 2015)
Economic life from January 1, 2015 (years)	5 (from January 1, 2015)	10 (from January 1, 2015)
Maximum service life from January 1, 2013 (years)	10 (from January 1, 2015)	20 (from January 1, 2015)
Annual Operating Cost (\$)	60,000	40,000
Salvage Value (\$)	<ul style="list-style-type: none"> • January 1, 2016: 100,000 • January 1, 2017: 80,000 • January 1, 2018: 50,000 • January 1, 2019: 20,000 • January 1, 2020: 0 	<ul style="list-style-type: none"> • First the 10 years (January 1, 2015 to January 1, 2025): 50,000 • Beyond January 1, 2025: 0

10. If the defender is NOT beyond its economic life, its annual equivalent cost based on the outsider approach is given by
- a) $-300,000(A/P, 10\%, 5) - 60,000$
 b) $-300,000(A/P, 10\%, 10) - 60,000$
 c) $-200,000(A/P, 10\%, 5) - 60,000$
 d) $-60,000$
11. If the defender is NOT beyond its economic life, its annual equivalent cost based on the insider approach is given by
- a) $-300,000(A/P, 10\%, 5) - 60,000$
 b) $-300,000(A/P, 10\%, 10) - 60,000$
 c) $-200,000(A/P, 10\%, 5) - 60,000$
 d) $-60,000$

12. If the defender is beyond its economic life, its annual equivalent cost based on the outsider approach is given by

-
- a) $-300,000(A/P, 10\%, 1) - 60,000 + 100,000(A/F, 10\%, 1)$
 - b) $-300,000(A/P, 10\%, 10) - 60,000 + 100,000(A/F, 10\%, 5)$
 - c) $-200,000(A/P, 10\%, 1) - 60,000 + 100,000(A/P, 100\%, 5)$
 - d) $-60,000$

13. The challenger's annual equivalent cost based on the outsider approach is given by

- ✓
- a) $-350,000(A/P, 10\%, 10) - 40,000 + 50,000(A/F, 10\%, 10)$
 - b) $-350,000(A/P, 10\%, 20) - 40,000$
 - c) $-350,000(A/F, 10\%, 20) - 40,000 + 100,000(A/P, 10\%, 20)$
 - d) $-40,000 + 50,000(A/F, 10\%, 10)$
 - e) None of these answers.

14. The challenger's annual equivalent cost based on the insider approach is given by

- X
- a) $-350,000(A/P, 10\%, 10) - 40,000 + 50,000(A/F, 10\%, 10)$
 - b) $-350,000(A/P, 10\%, 20) - 40,000$
 - c) $-350,000(A/F, 10\%, 20) - 40,000 + 100,000(A/P, 10\%, 20)$
 - d) $-40,000 + 50,000(A/F, 10\%, 10)$
 - e) None of these answers.

15. The decision to switch from the defender to the challenger is sensitive to the analyst's replacement perspective (i.e., whether the insider or outsider perspectives is used).

- X
- a) Yes.
 - b) No.
 - c) It depends.

QUESTIONS 16 TO 23

The Vertical Company is assessing the purchase of new equipment currently worth \$800,000. The equipment is

- expected to have a salvage value of \$500,000 after 3 years.
- generate annual revenues of \$700,000.
- have annual operating and maintenance costs of \$300,000.

Other information include:

- Depreciate the truck using the DB method ($d=10\%$).
- The before-tax interest rate is 10%.
- The after-tax interest rate is 5%.
- A 50% tax rate applies to net income from operations and to the recapturing of depreciation.
- The **half-year rule** applies.

The firm obtains a **\$600,000 loan** (at a 10% rate of interest) which is repaid as follows:

Repayment of loan at the end of year	Percentage of loan repaid
1	30
2	30
3	40

Item	End of Year Cash Flows			
	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
1. Before Tax Cash Flow				
2. Annual Depreciation		AA	BB	
3. Interest Expense			CC	
4. Taxable Income		DD		
5. Taxes Payable				
6. After Tax Cash Flow		EE		
7. Interest Expense				
8. Loan Repayment			FF	
9. Cash Flow on Owner Equity	GG			

16. The dollar value of cell AA is

- a) 40,000
- b) 68,400
- c) 76,000

- d) 80,000
- e) None of these answers.

17. The dollar value of cell BB is
- a) 40,000
 - X b) 68,400
 - c) 76,000
 - d) 80,000
 - e) None of these answers.

18. The dollar value of cell CC is
- a) 24,000
 - X b) 42,000
 - c) 60,000
 - d) 80,000
 - e) None of these answers

19. The dollar value of cell DD is
- a) 282,000
 - b) 300,000
 - X c) 400,000
 - d) 450,000
 - e) None of these answers.

20. The dollar value of cell EE is
- a) 246,200
 - b) 250,000
 - X c) 259,000
 - d) 269,500
 - e) None of these answers.

21. The dollar value of cell FF is
- a) 120,000
 - b) 180,000
 - X c) 240,000
 - d) None of these answers.

22. The dollar value of cell GG is
- ✓ a) -800,000
 - b) 800,000
 - c) -200,000
 - d) None of these answers.

23. The net salvage value of the equipment after 3 years is
- a) 500,000
 - X b) 527,020
 - c) 557,800
 - d) None of these answers.

24. Which of the following depreciation methods has a constant depreciation rate and a variable depreciation base?

- ✓ a) Straight line.
- b) Declining balance.
- c) Sum-of-years'-digits.
- d) None of these answers.

QUESTIONS 25 to 28

Splendron Company Balance Sheet December 31, 2014

ASSETS

Current Assets

Cash	60,000
Accounts Receivable	75,000
Raw Materials Inventory	210,000
Finished Goods Inventory	120,000

Total Current Assets

Long Term Assets

Equipment	800,000
Accumulated depreciation	250,000
Buildings	900,000
Accumulated depreciation	350,000
Land	700,000

Total Long Term Assets

TOTAL ASSETS

LIABILITIES AND OWNERS' EQUITY

Current Liabilities

Accounts Payable	60,000
Income Taxes Payable in 6 months	15,000
Loan due in 6 months	200,000

Total Current Liabilities

QUESTIONS 25 to 28

**Splendron Company Balance Sheet
December 31, 2014**

<u>Long Term Liabilities</u>	
Loans due in two (2) years	1,000,000
TOTAL LIABILITIES	
Common Stock: 30,000 shares @ \$20	600,000
Retained Earnings	????
<u>Total Owners' Equity</u>	
TOTAL LIABILITIES & OWNERS' EQUITY	

Splendron Company Income and Expense Statement January 1 to December 31, 2014	\$
REVENUES	
Sales	1,500,000
EXPENSES	
Cost of goods sold	900,000
Operating Expenses	140,000
Depreciation Expense	90,000
Interest Expense	95,000
Total Expenses	
PROFIT BEFORE TAXES	
Income Taxes @50% of Profit Before Taxes	
PROFIT AFTER TAXES	

25. Splendron Company's quick asset ratio (rounded to closest 2nd decimal) for calendar year 2014 was
- a) 0.34
b) 0.49
X c) 1.35
d) 1.69
e) None of these answers
26. Splendron Company's "long-term debt ratio" (rounded to closest 2nd decimal) for calendar year 2014 was
- a) 0.29
X b) 0.44
c) 0.56
d) 0.82
e) None of these answers
27. Splendron Company's "profitability ratio" (rounded to closest decimal) for calendar year

2014 was

- a) 5.6%
- b) 5.9%
- c) 6.1%
- d) 12.1%
- e) None of the above answers

28. Splendron Company's after-tax cash flow for calendar year 2014 was

- a) \$90,000
- b) \$140,000
- c) \$137,500
- d) \$275,000
- e) None of these answers

29. A company's after-tax cash flow (ATCF) is equal to its

- a) before-tax cash flow (BTCF) + the annual depreciation.
- b) before-tax cash flow (BTCF) + the annual depreciation.+ annual income taxes.
- c) before-tax cash flow (BTCF) - the annual depreciation
- d) before-tax cash flow (BTCF) - income taxes on profits. = 137
- e) None of these answers.

QUESTIONS 30 to 33

- CCA \equiv capital cost allowance
- UCC \equiv undepreciated capital cost
- () \equiv the disposition of assets.

Assume:

- $d = 10\%$ (Declining Balance)
- $t = 50\%$
- the half-year rule applies

Year	Adjustments to UCC from Purchases & Sales of assets	Base UCC Amount for CCA (\$)	CCA (\$)	Remaining UCC (\$)	Tax Savings Due to CCA (\$)
2011	\$300,000		AA		
2012	(\$100,000)	BB			CC
2013	\$400,000			DD	
2014	\$350,000				

30. The dollar amount of cell AA is

- a) 15,000
- b) 30,000
- c) 40,000
- d) None of these answers.

31. The dollar amount of cell BB is

- a) 100,000
- b) 150,000
- c) 185,000
- d) None of these answers

32. The dollar amount of cell CC is

- a) 7,500
- b) 9,250
- c) 15,000
- d) None of these answers

33. The dollar amount of cell DD is

- a) 201,600
- b) 497,700
- c) 529,850
- d) None of these answers.

34. You are looking at several companies for personal investment and are using the debt ratio among many other ratios. Would you be interested in investing in companies, other things being equal, with

- a) high debt ratios.
- b) low equity ratios
- c) low debt ratios.

35. With the straight line depreciation method, what is the relationship between a capital asset's book (BV) and its salvage (SV) values when the asset reaches its salvage value?

- a) $SV = BV$
- b) $SV > BV$
- c) $SV < BV$

0-0-0-0