

ENGINEERING ECONOMICS

ECO 1192A

Pink Assignment

****Revised November 27****

C.Théoret

Fall 2015

A. Assignment Instructions

1. Consult the Excel assignment allocation file on Virtual Campus for your individual assignment.
2. You will get a zero score for completing a different assignment.
3. A **PINK Scantron (answer sheet)** is required for your answers.
4. The colour of your Scantron is identified by a “Highlighter” mark in its upper right-hand corner.
5. The “Course Code” on the Scantron answer sheet for this assignment is **ECO1192AP**. Do not forget to darken the appropriate ovals.
6. Answer sheets (Scantrons) will be distributed and collected at the beginning of the **December 8th** lecture.
7. Late Scantron sheets will **most definitely** be rejected.
8. **Please note** that the last answer to each question is implicitly “None of these answers” unless the answers provided cover all possibilities (e.g., answers a) True; b) False)).
For example, if the answers a), b), c) and d) following a question seem incorrect to you, you should add the answer “e) None of these answers”. Of course, the alphabetic character of the answer that you add will depend on the alphabetic character of the last answer provided (i.e., it could be c), d) or e)).

B. Problem Statement

QUESTIONS 1 to 18

- The Express Trucking Company is planning to purchase a new truck to meet its growing customer demand.
- Cash flows and other relevant information for the Volvo, GM and Ford trucks are provided below.

<u>Truck Parameters</u>	<u>Volvo</u>	<u>GMC</u>	<u>Ford</u>
Initial Cost	\$335,000	300,000	375,000
Annual revenues	\$185,000	\$125,000 EOY1 increasing by 1,000 annually thereafter.	\$135,000 EOY1 increasing by 2,000 annually thereafter.
Annual costs	\$90,000 EOY1 decreasing by 1% annually thereafter.	75,000	\$65,000 EOY1 increasing by 5% annually thereafter.
End-of-life salvage value	-\$10,000	0	30,000
Useful life	5 years	10 years	10 years
MARR = 10%; The industry threshold for these trucks = 5 years			

1. The Annual Equivalent Worth (AEW) of the Volvo truck (to the closest \$100) is
a) 4,800; b) 5,800; c) 6,600; d) 6,800.
2. The AEW of the GMC truck (to the closest \$100) is
a) 4,600; b) 4,900; c) 5,400; d) 6,600.
3. The AEW of the Ford truck (to the closest \$100) is
a) 4,600; b) 4,900; c) 5,200; d) 5,600.
4. The best truck based on the AEW method is a) Volvo; b) GMC; c) Ford.
5. Based on the simple payback method, the recovery period (closest half or full year) of the Volvo machine is a) 2.5 years; b) 3.0; c) 3.5; d) 4.0.
6. Based on the simple payback method, the recovery period (closest half or full year) of the GMC machine is a) 4.5 years; b) 5.0; c) 5.5; d) 6.0.
7. If the average industry recovery period for these machines is 5 years, which of

- three trucks is best based on the simple payback method?
a) Volvo; b) GMC; c) Ford; d) None of the trucks is best.
8. Volvo's IRR (nearest 1st decimal) is a) 11.3%; b) 11.9%; c) 12.1%; d) 12.9%.
 9. GMC's IRR (nearest 1st decimal) is a) 11.3%; b) 11.7%; c) 12.2%; d) 12.9%.
 10. Ford's IRR (nearest 1st decimal) is a) 11.3%; b) 11.8%; c) 12.2%; d) 12.9%.
 11. Volvo's benefit/cost (B/C) ratio (nearest 1st decimal) is a) 0.8; b) 0.9; c) 1.0; d) 1.2.
 12. GMC's benefit/cost (B/C) ratio (nearest 1st decimal) is a) 0.8; b) 0.9; c) 1.0; d) 1.1.
 13. The incremental B/C ratio (nearest 2nd decimal) between the Volvo and GMC trucks is a) 0.99; b) 1.01; c) 1.03; d) 1.05.
 14. The incremental B/C ratio (nearest 2nd decimal) between the GMC and Ford trucks is a) 0.98; b) 1.01; c) 1.09; d) 1.12.
 15. The better of the Volvo and GMC trucks based on the B/C ratio is a) Volvo; b) GMC; c) Neither machine is valid.
 16. Volvo's External Rate of Return (ERR) (nearest 1st decimal) is a) 10.3%; b) 11.1%; c) 11.6%; d) 11.9%.
 17. GMC's ERR (nearest 1st decimal) is a) 10.7%; b) 11.1%; c) 11.4%; d) 11.6%.
 18. The better of the Volvo and GMC trucks based on the ERR method is a) Volvo; b) GMC; c) Neither the Volvo nor the GMC truck.

Questions 19 to 41

Prepare Rhapsody Company's Balance Sheet at December 31, 2013 and its Income and Expense statement for calendar year 2013 from which financial ratios are to be calculated.

The following Table provides the information for the preparation of Rhapsody's two financial statements.

Entry	Description	\$
1	ACCOUNTS PAYABLE BY MARCH 31, 2014.	115,500
2	Accounts receivable by April 10, 2014.	100,000
3	Accrued wages payable by February 28, 2014.	6,000
4	Cash	30,000
5	Common share capital	300,000
6	Cost of goods sold	550,000
7	Cumulative depreciation on plant	95,000
8	Cumulative depreciation on equipment	82,000
9	Plant depreciation in 2013.	6,000
10	Equipment depreciation in 2013	10,000
11	Equipment (first or historical cost)	420,000
12	Income taxes payable by March 31, 2014	4,000
13	Interest expense on loan in 2013	5,000
14	Interest income earned by Rhapsody Co. on financial assets	20,000
15	Inventory of finished goods on December 31, 2013.	50,000
16	Inventory of unfinished goods on December 31, 2013.	35,000
17	Land	250,000
18	5-year bonds issued by Rhapsody Co. (Maturity: March 21, 2017)	40,000
19	Short-term bonds purchased by Rhapsody Co. (Maturity: January 10, 2014)	5,000
20	Mortgage on plant maturing on April 1, 2020.	355,000
21	Miscellaneous operating expenses in 2013	15,000
22	Plant (Initial or historical cost)	510,000
23	Prepaid expenses on December 2013	2,500
24	Net sales in 2013	825,000
25	Retained earnings on December 31, 2013	405,000
26	Rent expense in 2013	25,000
27	UTILITIES (WATER, HEATING ...) IN 2013	35,000
28	Wages and salaries in 2013	90,000
Additional Information		
•	Average price of Rhapsody common shares during calendar year 2013.	\$40
•	Dividends per common share declared (and paid) on December 31, 2013.	\$1.00
•	Income tax rate on Rhapsody Co. profits	40%
•	Number of common shares outstanding on December 31, 2013	20,000

19. Net plant to the nearest \$1000 is
a) \$95,000; b) \$250,000; c) \$405,000; d) \$510,000.
20. Net equipment to the nearest \$1000 is
a) \$82,000; b) \$338,000; c) \$360,000; d) \$420,000.
21. Current assets to the nearest \$1000 are
a) \$217,000; b) \$255,000; c) \$222,500; d) \$507,000.
22. Long-term assets to the nearest \$1000 are
a) \$250,000; b) \$257,000; c) \$1,003,000; d) \$1,260,000.
23. Current liabilities to the nearest \$1000 are
a) \$111,000; b) \$125,500; c) \$130,000; d) \$145,000.
24. Long-term liabilities to the nearest \$1000 are
a) \$40,000; b) \$355,000; c) \$395,000; d) \$425,000.
25. Total equity (ownership) to the nearest \$1000 is
a) \$395,000; b) \$510,000; c) \$610,000; d) \$705,000.
26. Working capital to the nearest \$1000 is
a) \$87,000; b) \$97,000; c) \$257,000; d) \$510,000.
27. Total operating expenses including the cost of goods sold to the nearest \$1000 are
a) \$186,000; b) \$550,000; c) \$720,000; d) \$736,000.
28. Profits before income taxes to the nearest \$100 are
a) \$43,600; b) \$65,400; c) \$109,000; d) \$186,000.
29. Profits after income taxes to the nearest \$100 are
a) \$43,600; b) \$65,400; c) \$109,000; d) \$186,000.
30. The after-tax cash flow (ATCF) to the nearest \$100 in 2013 was
a) \$43,600; b) \$65,400; c) \$109,000; d) \$81,400.
31. Rhapsody's current ratio (nearest 2nd decimal) is
a) 1.32; b) 1.45; c) 1.69; d) 1.77.
32. Rhapsody's quick-asset ratio (nearest 2nd decimal) is
a) 1.10; b) 1.37; c) 1.48; d) 1.56.
33. Rhapsody's equity percentage (nearest 1st decimal) is

- a) 53.7%; b) 57.5%; c) 60.1; d) 60.4%.
34. Rhapsody's inventory-turnover ratio (nearest 1st decimal) is
a) 8.3; b) 8.9; c) 9.2; d) 9.7.
35. Rhapsody's percentage return on total assets (nearest 1st decimal) is
a) 5.3%; b) 5.7%; c) 6.4%; d) 6.9.
36. Rhapsody's interest coverage (nearest 1st decimal) is
a) 10.2; b) 15.5; c) 18.7; d) 20.8.
37. Rhapsody's earnings per share (nearest dime) is
a) \$2.80; b) \$3.10; c) \$3.30; d) \$3.60.
38. Rhapsody's price-earnings ratio (nearest 1st decimal) is
a) 10.2; b) 11.8; c) 12.0; d) 12.2.
39. Rhapsody's dividend-payout percentage (nearest 1st decimal) is
a) 29.6%; b) 29.9%; c) 30.4%; d) 30.6.
40. Rhapsody's percentage return on equity (nearest 1st decimal) is
a) 8.7%; b) 9.3%; c) 9.8%; d) 10.1%.
41. If Rhapsody's after-tax profits in 2013 exceeded its operational expenses and the payment of dividends to shareholders, the excess after-tax profits would be recorded in
a) current assets; b) current liabilities; c) total revenues; d) retained earnings.

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