KINGDOM OF BAHRAIN
MINISTRY OF EDUCATION

MODEL ANSWERS

نموذج امتحان محاكي لنهاية الفصل الدراسي الثاني للتعليم الثانوي للعام الدراسي 2024/2023

COURSE NAME : Financial Math
COURSE CODE : FIN316
TRACK : Unified
TIME : 2 Hours

Read all the instruction for each question carefully before answering questions.

First Part: compound Interest

Question One:

Sakeena Ahmed deposited BD2,600 in a bank at 12% annually compounded quarterly- Find future value at the end of 5 years and 9 months and find the compound interest.

$N = 5 \times 4 = 20 + \frac{9}{12} \times 4 = 23$ $i = \frac{12\%}{4} = 3\%$

$F.V = 2600(1.03)^{23}$

$F.V = 2600 \times 1.9735$

$F.V = BD\ 5131.1$

$C.I = 5131.1 - 2600 = BD\ 2531.1$

Question Tow:

Find the future value that Saad will get if he saves BD2,000 in a bank for 10 years at changing rate, as following: at 5% annually for the first 5 years, 4.6% annually for the sixth year and 5.25 % annually for the rest years?

$F.V = 2,000(1.05)^5(1.046)^1(1.0525)^4$

$F.V = 2,000 \times 1.2762 \times 1.046 \times 1.2271$

$F.V = BD\ 3276.124$

By student: Qassim Hassan Almudaweb

Question Three:

Find the present value if the future value after 5 years is BD1469.330 and the compound interest rate is 8% annually then find the interest.

$1469.330 = P.V\ (1.08)^5$

$1469.330 = P.V \times 1.4693$

$P.V = \frac{1469.330}{1.4693}$

$P.V = 13D\ 1000$

$C.I = 1469.330 - 1000 = 13D\ 469.330$

Question Four:

Fayez invested BD3500 at 7% annually after 3 years he withdrew from his account BD1000 and invested the rest at 8% annually - find the future value at the end of 10 years?

① $F.V = 3500\ (1.07)^3$

$F.V = 3500 \times 1.2250$

$F.V = 13D\ 4287.500$

② $New\ P.V = 4287.500 - 1000 = 13D\ 3287.500$

③ $F.V = 3287.500\ (1.08)^7$

$F.V = 3287.500 \times 1.7138$

$F.V = 13D\ 5634.118$

Second Part: Annuities

Question One:

Ahmed paid an annuity of BD400 at the end of each year for 7 years at an interest rate of 3% annually. Find the following:

a- Future value (amount) and interest at the end of the period.

b- Present value (amount) at the end of the period.

a- $F.V_n = 400 \times \frac{[(1.03)^7 - 1]}{0.03}$

$F.V_n = 400 \times \frac{[1.2299 - 1]}{0.03}$

$F.V_n = 400 \times \frac{0.2299}{0.03}$

$F.V_n = 400 \times 7.6633$

$F.V_n = BD\ 3065.32$

$C.I = 3065.32 - (400 \times 7) = BD\ 265.320$

b- $P.V_n = 400 \times \frac{[1 - (1.03)^{-7}]}{0.03}$

$P.V_n = 400 \times \frac{[1 - 0.8131]}{0.03}$

$P.V_n = 400 \times \frac{0.1869}{0.03}$

$P.V_n = BD\ 2492$

Question Tow:

Sajeda deposits a sum of money at the beginning of each year at 4% annually and the amount of annuity became BD1872.96 after 10 years.
What was the value of each annuity?

$1872.96 = PMT \times \frac{[(1.04)^{10} - 1]}{0.04} \times (1.04)$

$1872.96 = PMT \times \frac{[1.4802 - 1]}{0.04} \times (1.04)$

$1872.96 = PMT \times 12.4852$

$PMT = \frac{1872.96}{12.4852} = BD\ 150$

By student: Qassim Hassan Almudaweb

Third Part: Capital Budgeting Decision

Question One (A - b - c):

The following A project " their cash flow and using 8% discount rate.

Cash Flow	Project A
Cost (Cash Outflow)	BD20,000
Cash inflow year 1	BD6,000
Cash inflow year 2	BD6,000
Cash inflow year 3	BD6,000
Cash inflow year 4	BD6,000

A - Payback Period Method.

Projects A: (Fixed Cash Inflow):

payback period = $\frac{20,000}{6,000}$ = 3.333 years

b- Net Present Value Method.

Projects A: (Fixed Cash Inflow):

Year	Cash flow (CF)	X (1+i)-n	PV of cash flow
0	-20,000	$X (1.08)^{-0} = 1$	-20,000
1	6,000	$X (1.08)^{-1} = 0.9259$	5,555.4
2	6,000	$X (1.08)^{-2} = 0.8573$	5,143.8
3	6,000	$X (1.08)^{-3} = 0.7938$	4,762.8
4	6,000	$X (1.08)^{-4} = 0.7350$	4,410
Net present value (NPV)			-128

c- Profitability Index Method.

PI project A = $\frac{-128 + 20,000}{20,000}$ = 0.9936 < 1 (Reject)

By student: Qassim Hassan Almudaweb

Fourth Part: Break-even Analysis

Question One:

Abdulla Company expects to earn BD48,000 next year. Sales will be BD370,000, its average product sells for BD74 per unit. The variable cost per unit is BD50.

Required:

1- What are the company's fixed costs expected to be next year?
2- Calculate the company's break-even point in units and sales revenues for break-even?

No. of unit sales = $\frac{370,000}{74}$ = 5000 units

Total variable cost = 5000 X 50 = BD 250,000

Total cost = 370,000 - 48,000 = BD 322,000

* Total fixed cost = 322,000 - 250,000 = BD 72,000

* break-even point in units = $\frac{72,000}{74 - 50}$ = 3000 units

* Sales revenues for break-even = 3000 X 74 = BD 222,000

Question Tow:

ABC Company sold a computer at BD20 per unit and it had variable cost BD12 per unit. The total annual fixed cost is BD160,000.

Required:

1- How many units must be sold to earn an operating income of BD40,000.
2- Compute sale revenue needed to earn an operating income of BD40,000.
3- If the company sold 30,000 units, what would be the company's profit or loss?

① Sales in units to earn income = $\frac{160,000 + 40,000}{20 - 12}$ = 25,000 units

② Sales in revenue to earn income = 25000 X 20 = BD 500,000

③ company sold 30,000 units = 30,000 (20-12) - 160,000 = BD 80,000 profit

By student: Qassim Hassan Almudaweb

Fiveth Part: Financial Ratio Analysis

Question One:

The balance sheet and income statement for MRG Company are as follows.

Balance Sheet	BD 000
Cash	500
Account Receivable	2,000
Inventories	1,000
Current Assets	**3,500**
Fixed Assets	4,500
Total Assets	**8,000**
Current Liabilities	2,000
Long-term debt	2,000
Owners' Equity	4,000
Total Liabilities and equity	**8,000**

Income Statement	BD 000
Net Sales (Revenues)	8,000
- Cost of Goods Sold	3,200
Gross Profit	**4,800**
- Operating Expenses	800
Operating Income	**4,000**
Interest Expenses	1,000
Profits before taxes	**3,000**
Tax (5%)	150
Net Income	**2,850**

No	Required	
1	Gross profit margin %	$= \frac{4,800}{8,000} \times 100 = 60\%$
2	Profit margin %	$= \frac{3,000}{8,000} \times 100 = 37.5\%$
3	Working Capital	$= 3,500 - 2,000 = 1,500$
4	Capital Employed.	$= 8,000 - 2,000 = 6,000$
5	Return on capital employed	$= \frac{3,000}{6,000} \times 100 = 50\%$
6	Current ratio.	$= \frac{3,500}{2,000} = 1.75$ time
7	Acid test ratio (Quick Ratio).	$= \frac{3,500 - 1,000}{2,000} = 1.25$ time

By student: Qassim Hassan Almudaweb