

**KINGDOM OF BAHRAIN  
MINISTRY OF EDUCATION  
INTERNAL EXAMS SECTION  
SECONDRY EDUCATION / UNIFIED TRACK**

**SECOND SEMESTER EXAM 2023/2024**

**COURSE NAME:** FINANCIAL MATHEMATICS 2

**TRACK:** التجاري وتوحيد المسارات

**COURSE CODE:** 316 مال

**TIME:** 2 Hours

**QUESTION ONE:**

36 × ½

18

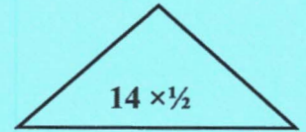
1. Luluwa borrowed \$6700 from a bank at 6% quarterly. Find the amount she will pay at the end of 3 years and 6 months. In addition, calculate the interest.

(7 marks)

$$n = 3 + \frac{6}{12} = 3.5 \times 4 = 14$$

$$FV = 6700 \times (1 + 6\%)^{14} \\ = 6700 \times 2.2609 = \text{BD } 15148.030$$

$$CI = 15148.030 - 6700 = \text{BD } 8448.030$$

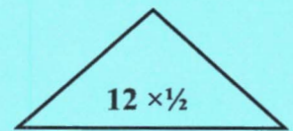


الإسلام  
هو  
حسب  
العباد

2. What is the future value for BD2,500 invested at 4% annually for 3 years, and 3.8% annually for 5 more years?

(6 marks)

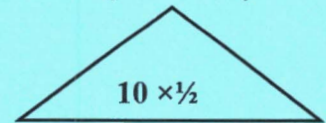
$$FV = 2500 \times (1 + 4\%)^3 \times (1 + 3.8\%)^5 \\ = 2500 \times 1.1249 \times 1.2050 \\ = \text{BD } 3388.761$$



3. Find the present value (principal) that generates an interest of BD700 at 3% annually for 5 years.

(5 marks)

$$PV = 700 \div ((1 + 3\%)^5 - 1) \\ = \frac{700}{(1.1593 - 1)} \\ = \text{BD } 4394.225$$



يراعى  
القطر المتررب

**QUESTION TWO:**

- 1- Sami paid an annuity of BD 400 at the end of each 4 months for 7 years at an interest rate of 6% annually, compounded interest thirdly. Find the following:

- a. Future value (amount)

$$n = /3 \times 7/ = 21 \text{ times/}$$

$$i = \frac{6\%}{3} = 2\% \text{ thirdly/}$$

$$FV_n = 400 / \times \left[ \frac{(1 + 2\%)^{21} - 1}{2\%} \right]$$

$$FV_n = 400 \times 25.78332 /$$

$$= \text{BD}10313.328 /$$

- b. Interest at the end of the period.

$$CI = 10313.328 / - (400 / \times 21 /) = \text{BD} 1913.328 /$$

- 2- Reem deposited at the beginning of each year at an equal payment for 10 years at 2.5% annually. If the total amount of annuities at the end of the period was BD 5741.735, Find the value of each annuity.

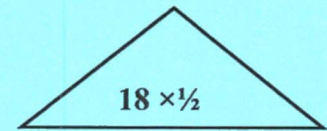
$$PMT = 5741.735 / \div \left[ \frac{(1 + 2.5\%)^{10} - 1}{2.5\%} \right] \div (1 + 2.5\%)$$

$$PMT = 5741.735 / \div 11.48347 // = \text{BD} 500 /$$

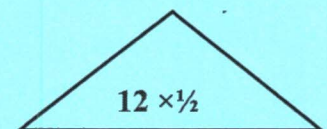
30 × ½

15

(9 marks)



(6 marks)



الإسلام هبة حسن العباد

**QUESTION THREE:**

Ameer Company has two potential projects, all with an initial cost of BD 40,000. Given the discount rates and future cash flow of each project.

26×½

13

**Required:** Which project do you accept? (Using **Payback Period Method**)

Cash Flow	Project A BD	Project B BD
Cash flow year 1	10000	13000
Cash flow year 2	10000	12500
Cash flow year 3	10000	11500
Cash flow year 4	10000	8200
Cash flow year 5	10000	7500

**Payback Period Method.****1. Project A (Fixed Cash Inflow)**

$$\text{Payback Period} = \frac{40000/}{10000/} = 4 \text{ /years}$$

**2. Project B: (Changeable Cash Inflow)**

Year	Cash Flow BD	Yet to be recovered BD	Payback Period Year
0	-40000/		= 3/ + $\frac{3000/}{8200/}$ = 3.37/
1	13000/	-40000 /+13000 /=-27000/	
2	12500/	-27000/+12500 /=-14500 /	
3	11500/	-14500 /+11500 /=-3000 /	
4	8200/	-3000/+8200 /= 0 / (recovered)	
5	7500/	Not used in decision	

- We can choose project B because it has the lowest payback period. The company required 3.37 years to recover period less than projects A. /

**QUESTION FOUR:**

XYZ Company sold a computer at BD 24 per unit, and it had a variable cost of BD 21 per unit. The total annual fixed cost is BD45,000.

14×½

7

**Required:**

- 1) Calculate contribution margin per unit.
- 2) Calculate contribution margin percentage.
- 3) Calculate break-even point sales in units.
- 4) Calculate break-even point sales revenue in BD.

$$1- \text{Unit Contribution Margin} = 24/ - 21/ = \text{BD } 3/$$

$$2- \text{Contribution Margin Percentage} = \frac{24/ - 21/}{24/} \times 100 = 12.5\% /$$

$$3- \text{Break - even point sales in units} = \frac{45000/}{24/ - 21/} = 15000 \text{ units} /$$

$$4- \text{Break - even point sales in BD} = \frac{45000/}{12.5\% /} = \text{BD } 360000 /$$

$$\text{OR: Break - even point sales in BD} = 15000 / \times 24 / = \text{BD } 360000 /$$

الدكتور محمد حسن العواي

**QUESTION FIVE:**

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

14×½

7

Balance Sheet	BD 000
Cash	1500
Account Receivable	3000
Inventory	2000
<b>Current Assets</b>	<b>6500</b>
Fixed Assets	5500
<b>Total Assets</b>	<b>12000</b>
Current Liabilities	2000
Long-term debt	4000
Owners' Equity	6000
<b>Total Liabilities and Equity</b>	<b>12000</b>

Income Statement	BD 000
Net Sales (Revenues)	9000
Cost of Goods Sold	4200
<b>Gross Profit</b>	<b>4800</b>
Operating Expense	1800
<b>Operating Income</b>	<b>3000</b>
Interest Expense	800
<b>Profits before taxes</b>	<b>2200</b>
Tax (10%)	220
<b>Net Income</b>	<b>1980</b>

**Required:**

**Calculate the following ratios:**

$$1- \text{Gross Profit Margin \%} = \frac{4800/}{9000/} \times 100 = \%53.33/$$

$$2- \text{Profit Margin \%} = \frac{2200/}{9000/} \times 100 = \%24.44/$$

$$3- \text{Current Ratio} = \frac{6500/}{2000/} = 3.25 \text{ Times /}$$

$$4- \text{Acid Test Ratio (Quick Ratio)} = \frac{6500 / -2000/}{2000/} = 2.25 \text{ Times //}$$

**END OF ANSWER**

الدكتور محمد حسن العاني