The University of Jordan

الجامعة الاردنية

Paper-based :Form Questions Cover Sheet	Policy	
	Issue Number and Date	SUJ-02-01-04A 2/3/24/2022/2963 5/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	3/ 4/24/2023
	The Date of the Deans Council Approval Decision	23/1/2023
	Number of Pages	01

School	Engineering			Department	Industrial Engineering
Course Name	Statistical Quality Control			Course No.	0906423
Academic Year	2023/2024	Semester	Summer	Exam Type	Midterm
Exam Date	30/7/2024			Exam Time	13:00-14:00

[redacted] الرقم الجامعي: [redacted] اسم الطالب(بالعربي):

الرقم المتسلسل: وقت المحاضرة:12:15-13:30 رقم الشعبة:1 اسم المدرس: ا.د عباس الرفاعي

Important Instructions

- This is a opened book exam; all related material must be placed away from your desk.
- Cell phone use is prohibited for any purpose: Your cell phone must be turned off and placed off of the desk. Cell phones may not be accessed during the exam. Failure to comply may be treated as a violation of the Honor Code.
- Headphones of any kind are not permitted.
- This exam is (50) minutes long.
- Make sure that you have (3) pages including this page.
- This exam has (4) essay questions. Read each question carefully before answering.
- Calculators can be used but can *not* be shared.
- When you finish, you must:
  - Check that you have written your information in the spaces provided.
  - Give the exam package (all papers) to the proctor before you leave.

For Teacher's Use Only

No.	ILO	SO	DL	Mark	Weight
1					
2					
3					
4					
5					
6					
7					
8					
Total					

28/30

For Proctor's Remarks

PI: Key Performance Indicator, ILO: Intended Learning Outcome, SO: Student Outcome,

DL: Difficulty Level (1. Easy, 2. Average, 3. Hard, 4. Very Hard)

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Q1 (8 pts: 15 min). Please state whether each of the following statements is True/False. Please correct the incorrect terms/phrases.

- Cost assignment is the collection of cost data in some organized way by means of an accounting system. accumulation
- An increase in the income tax rate does not affect the breakeven point. does affect (inverse relation)
- The larger the amount of a cost is, the more likely that it is economically feasible to trace that cost to a particular cost object. --- smaller
- If there are no fixed costs, the degree of operating leverage equals 1.00 at all sales levels. TRUE
- The cost of the (General Chemicals facility) dedicated to manufacturing (soda) ash is an indirect cost of soda ash. TRUE
- Cost accounting describes the approaches to use resources to increase value to customers. --- management
- Gross margin indicates how much of a company's revenues are available to cover fixed costs. Contribution
- Conversion costs are all nonmanufacturing costs other than direct material costs. - manufacturing
- Merchandising sector companies purchase and then sell tangible products without changing their basic form. TRUE
- Direct cost is the sum of the costs assigned to a product for a specific purpose. TRUE
- In CVP, the number of units sold is the only revenue driver and the only cost driver. ~~company~~ TRUE
- A CVP chart shows how changes in the quantity of units sold affect operating income. PV graph
- Operating leverage describes the effects that fixed costs have on changes in operating income as changes occur in units sold and contribution margin. --- operating leverage
- Whenever there are no fixed costs, the degree of operating leverage decreases as the level of sales increases beyond the breakeven point. --- there are
- Contribution margin measures how much a company can charge for its products over and above the cost of acquiring or producing them. --- gross
- The operating income is that quantity of output sold at which total revenues equal total costs. --- Break-even-point (BEP)

product

3 : 1

Q2 (4 pts: 10 min) Given the sales mix of products A and B in a ratio 150,000: 50,000. The contribution margin per unit ($) is 6 and 12, respectively. The total fixed costs = $ 1,200,000.

Calculate the following:	
The contribution margin per bundle =	30 $/bundle
The number of units of product A to breakeven =	120,000 unit of (A)
If only product A was sold, the breakeven point =	200,000 unit

C.M per bundle = (3)(6$) + (1)(12$) = 30$

BEP (bundles) $\left[\frac{F.C}{c.m \text{ per bundle}}\right]$ = $\frac{1,200,000}{30}$ = 40,000 bundle

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120,000 (A)

40,000 (B)

} 160,000 unit

BEP (units) = $\frac{F.C}{c.M \text{ per unit}}$ = $\frac{1,200,000}{6}$ = 200,000 unit

D.M + D.L + M.O.H = 840,000

D.M + (660,000) = 840,000

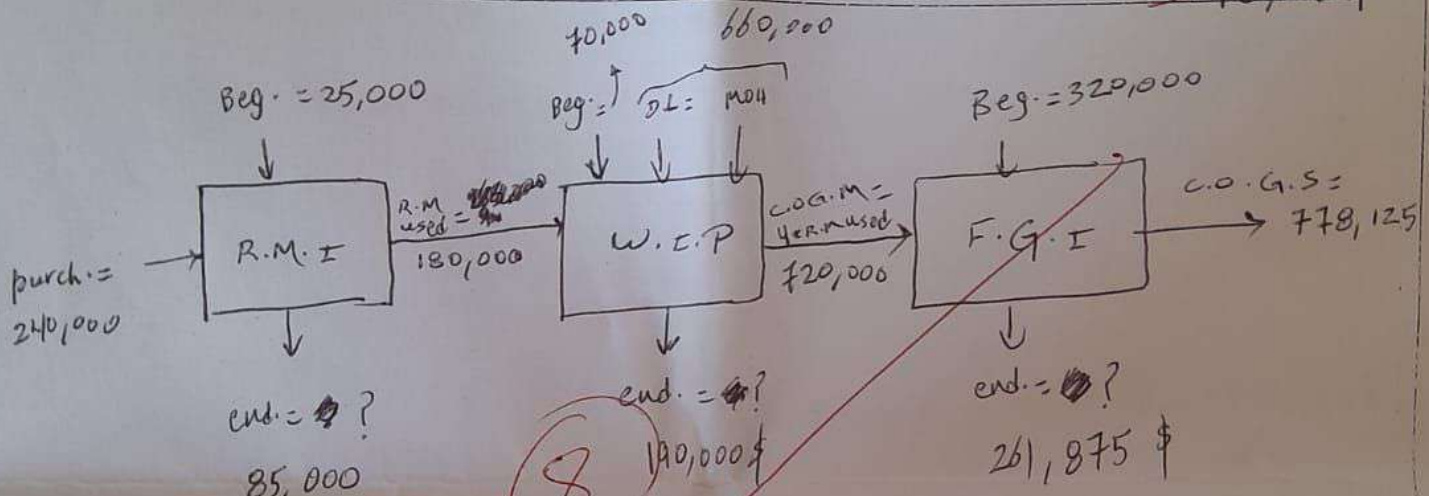
D.M = 180,000

Q3 (8 pts; 15 min). The Howell Corporation has the following account balances for 2023:

Cost item	Amount ($)	Cost item	Amount ($)
Direct materials purchased	240,000	Conversion costs (D.L + MOH)	660,000
Direct materials inventory, Jan. 1, 2023	25,000	Revenues	1,037,500
Work-in-process inventory, Jan. 1, 2023	70,000	Gross margin as a percentage of revenues	25%
Finished goods inventory, Jan. 1, 2023	320,000	Total manufacturing costs added during the period	840,000
Cost of goods manufactured	4 times direct materials used		

Calculate

Direct materials inventory ($), Dec., 31, 2023 =	~~85,000 $~~
Work-in-process inventory ($), Dec., 31, 2023 =	~~190,000 $~~
Finished goods inventory ($), Dec., 31, 2023 =	~~261,875 $~~
Cost of goods sold ($), Dec., 31, 2023 =	~~778,125 $~~



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Revenues 1,037,500

C.O.G.S 778,125

G.M 259,375

end. (RMI) = (240,000) + (25,000) − (180,000) = 85,000 $

end (WIP) = (180,000 + 70,000 + 660,000) − (720,000) = 190,000 $

end (F.G.I) = 261,875 $

$F_{mktg} = 8,000\$$ $V = 60,000 + (10\%)(100,000) = 70,000\$$

Q4 (10 pts: 20 min) ABC manufactures and sells electronic products. Given the following information:

Cost item	Amount ($)
Selling price	10
Revenues	100,000
Variable Manufacturing costs	55,000
Fixed manufacturing costs	20,000

Variable marketing costs	5,000
Fixed Marketing costs	10,000
Tax rate	10 %

$t = 0.1$, $1 - t = 0.9$

1. **Calculate**

Contribution margin percentage	40%
Breakeven revenues ($)	~~75,000 $~~
The margin of safety (in units)	~~2,500 unit~~
Degree of operating leverage	4
2. If marketing fixed cost is reduced by 20%, and a commission of 10 % of revenues is paid	
Contribution margin	~~30,000 $~~
Breakeven quantity in units	~~9,334 unit~~
3. If the quantity sold is increased by 50% units (use part 1):	
Operating income ($)	30,000 $
Net income ($)	27,000 $

$Q = 10,000$ unit

	TOTAL	per unit	%
R	100,000	10 $	100%
V.C	60,000	6 $	60%
C.M	40,000	4 $	40%
F.C	30,000		
O.I	10,000		

$\#\ BEP(\$) = \frac{F.C}{C.M\%} = \frac{30,000}{40\%} = 75,000\$$

$\#\ M.O.S = (10,000\ unit) - (7,500) = 2,500\ unit$

$B.E.P(units) = \frac{F.C}{C.M\ per\ unit} = \frac{30,000}{4} = 7,500\ unit$

$\#\ D.O.L = \frac{C.M}{O.I} = \frac{40,000}{10,000} = 4$

$Q = 10,000$

	TOTAL	per unit	%
R	100,000 $	10 $	100%
V.C	70,000	7 $	70%
C.M	30,000 $	3 $	30%
F.C	28,000 $		
O.I	2,000 $		

$\#\ BEP(units) = \frac{28,000\$}{3} = 9,333.33$

$\left[\frac{F.C}{u.C.M}\right]$ 10

$\approx 9,334$ unit.

$Q = 15,000$

	TOTAL	per unit
R	150,000	10
V.C	90,000	6
C.M	60,000	4
F.C	30,000	
O.I	30,000 $	

$\#\ O.I.A.T = (0.9)(30,000\$)$

$= 27,000\$$