1. (25%)

The Jarvis Corporation produces bucket loader assemblies for the tractor industry. The product has a long term life expectancy. Jarvis has a traditional manufacturing and inventory system. Jarvis is considering the installation of a just-in-time inventory system to improve its cost structure. In doing a full study using its manufacturing engineering team as well as consulting with industry JIT experts and the main vendors and suppliers of the components Jarvis uses to manufacture the bucket loader assemblies, the following incremental cost-benefit relevant information is available for analysis:

The Jarvis cost of investment capital hurdle rate is 15%. One time cost to rearrange the shop floor to create the manufacturing cell workstations is $275,000. One time cost to retrain the existing workforce for the JIT required skills is $60,000. Anticipated defect reduction is 40%. Currently there is a cost of quality defect assessment listed as $150,000 per year. The setup time for each of the existing functions will be reduced by 67%. Currently the forecast for setup costs are $225,000 per year. Jarvis will expect to save $200,000 per year in carrying costs as a result of having a lower inventory.

The suppliers will require a 15% premium over the current level of prices in order to position themselves to supply the material on a smaller and more frequent schedule. Currently the materials purchases are $1,500,000 per year.

Required:

1.1. What is the amount of the initial investment?

1.2 What is the amount of the annual savings of installing the JIT system?

1.3 What is the amount of the annual increased costs of installing the JIT system?

1.4 What is the return on investment of installing the JIT system?

1.5 Should the JIT project should be implemented? Why?

2. (25%)

Viking Sports is a manufacturer of sportswear. It produces all of its products in one department. The information for the current month is as follows:

Beginning work in process	20,000 units
Units started	40,000 units
Units completed	50,000 units
Ending work in process	8,000 units
Spoilage	2,000 units

Beginning work-in-process direct materials	$12,000
Beginning work-in-process conversion	$ 4,000
Direct materials added during month	$60,000
Direct manufacturing labor during month	$20,000

Beginning work in process was half complete as to conversion. Direct materials are added at the beginning of the process. Factory overhead is applied at a rate equal to 50% of direct manufacturing labor. Ending work in process was 60% complete. All spoilage is normal and is detected at end of the process.
Suppose spoilage is recognized and the weighted-average method is used.

Required:

2.1 What is the amount of the costs transferred out?
2.2 What is the amount of the normal spoilage?
2.3 What is the equivalent units of direct materials?
2.4 What is the amount of direct materials cots in ending work in process?
2.5 What is the amount of conversion cots in ending work in process?

3. (25%)

Aromatic Coffee Company sells two types of coffee, Colombian and Blue Mountain. The monthly budget for U.S. coffee sales is based on a combination of last year's performance, a forecast of industry sales, and the company's expected share of the U.S. market. The following information is provided for March:

	Actual		**Budget**	
	Colombian	Blue Mountain	Colombian	Blue Mountain
Sales in pounds	14,000 lbs.	16,000 lbs.	12,800 lbs.	17,200 lbs
Price per pound	$12.50	$15.00	$12.50	$15.00
Variable cost per pound	5.50	7.00	6.00	6.50
Contribution margin	$7.00	$8.00	$6.50	$8.50

Budgeted and actual fixed corporate-sustaining costs are $60,000 and $72,000, respectively.

Required:

3.1 Calculate the actual contribution margin for the month.

3.2 Calculate the contribution margin for the static budget.

3.3 Calculate the contribution margin for the flexible budget.

3.4 Calculate the total flexible-budget variance in terms of the contribution margin.

3.5 Calculate the total sales-volume variance in terms of the contribution margin.

4. (25%)

Mount Carmel Company sells only two products, Product A and Product B.

	Product A	Product B	Total
Selling price	$40	$50	
Variable cost per unit	$24	$40	
Total fixed costs			$840,000

Mount Carmel sells two units of Product A for each unit it sells of Product B. Mount Carmel faces a tax rate of 30%.

Required:

4.1 What is the breakeven point in units for each product assuming the sales mix is 2 units of Product A for 1 unit of Product B?

4.2 What is the breakeven point if Mount Carmel's tax rate is reduced to 25%, assuming the sales mix is 2 units of Product A for 1 unit of Product B?

4.3 How many units of each product would be sold if Mount Carmel desired an after-tax net income of $73,500, facing a tax rate of 30%?