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ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF MECHANICAL AND PRODUCTION ENGINEERING

Semester Final Examination

Summer Semester, A.Y. 2021-2022

Course No. IPE 4439

Time : 3 hours

Course Title: Principles of Economics and Cost Accounting

Full Marks: 150

There are 6 (Six) Questions. Answer all of them.
Marks in the margin indicate the full marks.

1. a) ABC Company sells fishing equipment. One of the company's products is a basic tackle box being sold for \$48 per unit. Variable expenses are \$36 per tackle box, and fixed expenses associated with the tackle box are \$18,000 per month. Required: (15)
(CO1)
(PO1)

- i. Compute the company's break-even point in number of tackle boxes and in total sales dollars.
- ii. If the variable expenses per tackle box increase as a percentage of the selling price, will it result in a higher or a lower break-even point? Why? (Assume that the fixed expenses remain unchanged.)
- iii. At present, the company is selling 2,600 tackle boxes per month. The sales manager is convinced that a 12.5% reduction in the selling price will result in a 20% increase in the number of tackle boxes sold each month. Prepare two contribution income statements, one under current operating conditions, and one as operations would appear after the proposed changes. Show both total and per unit data on your statements.

- b) Differentiate between process costing and job-order costing. (05)
(CO1)
(PO1)
- c) Write the major advantages and disadvantages of the Weighted-Average Method of process costing. (05)
(CO1)
(PO1)

2. XYZ company is a manufacturing firm that uses job-order costing. On January 1, the beginning of its fiscal year, the company's inventory balances were as follows: (25)
(CO2)
(PO2)

Raw materials	\$20,000
Work in process.	15,000
Finished goods.	30,000

The company applies overhead cost to jobs on the basis of machine-hours worked. For the current year, the company estimated that it would work 75,000 machine-hours and incur \$450,000 in manufacturing overhead cost. The following transactions were recorded for the year:

- a. Raw materials were purchased on account: \$410,000.

- b. Raw materials were requisitioned for use in production: \$380,000 (\$360,000 direct materials and \$20,000 indirect materials).
- c. The following costs were incurred for employee services: direct labour, \$75,000; indirect labour, \$110,000; sales commissions, \$90,000; and administrative salaries, \$200,000.
- d. Sales travel costs were incurred: \$17,000.
- e. Utility costs were incurred in the factory: \$43,000.
- f. Advertising costs were incurred: \$180,000.
- g. Depreciation was recorded for the year: \$350,000 (80% relates to factory operations, and 20% relates to selling and administrative activities).
- h. Insurance expired during the year: \$10,000 (70% relates to factory operations, and the remaining 30% relates to selling and administrative activities).
- i. Manufacturing overhead was applied to production. Due to greater than expected demand for its products, the company worked 80,000 machine-hours during the year.
- j. Goods costing \$900,000 to manufacture according to their job cost sheets were completed during the year.
- k. Goods were sold on account to customers during the year at a total selling price of \$1,500,000. The goods cost \$870,000 to manufacture according to their job cost sheets.

Required:

- i. Prepare journal entries to record the preceding transactions.
- ii. Post the entries in (1) above to T-accounts (don't forget to enter the opening balances in the inventory accounts).
- iii. Is Manufacturing Overhead underapplied or overapplied for the year?

3. a) AB Company manufactures a product that goes through two departments prior to completion. The information shown in the table below is available about work in the first department, the Mixing Department, during June:

(10)
(CO2)
(PO2)

	Units	Percentage Complete	
		Materials	Conversion
Work in process, beginning	50,000	75%	30%
Started into production	430,000		
Completed and transferred out	380,000		
Work in process, ending	100,000	60%	40%

	Materials	Conversion
Work in process, beginning	\$ 45,500	\$25,000
Costs added during June	\$425,500	\$145,000

Required: Assume that the company uses the weighted-average method.

- i. Determine the equivalent units for June for the first process.
- ii. Compute the costs per equivalent unit for June for the first process.
- iii. Determine the total cost of ending work in process inventory and the total cost of units transferred to the next process in June.

- b) ABD Company uses the FIFO method in its process costing system. The following data are for the most recent month of operations in one of the company's processing departments:

(15)
(CO2)
(PO2)

Units in beginning inventory	400
Units started into production	4,300
Units in ending inventory	300
Units transferred to the next department	4,400

	Materials	Conversion
Percentage completion of beginning inventory	70%	30%
Percentage completion of ending inventory	80%	40%

The cost of beginning inventory according to the company's costing system was \$7,886, of which \$4,897 was for materials and the remainder was for conversion cost. The costs added during the month amounted to \$181,652. The costs per equivalent unit for the month were as follows:

	Materials	Conversion
Cost per equivalent unit	\$18.20	\$23.25

Required:

- i. Compute the total cost per equivalent unit for the month.
 - ii. Compute the equivalent units of material and of conversion costs in the ending inventory.
 - iii. Compute the equivalent units of material and of conversion costs that were required to complete the beginning inventory.
 - iv. Determine the number of units started and completed during the month.
 - v. Determine the costs of ending inventory and units transferred out.
4. XYZ manufactures a small personal water tube used for children learning to swim. Management is now preparing detailed budgets for the third quarter, July through September, and has assembled the following information to assist:

(25)
(CO3)
(PO11)

- a. The Marketing Department has estimated sales as follows for the remainder of the year (number of water tubes):

July	6,500	October	3,000
August	5,000	November	2,500
September	4,000	December	2,000

The selling price of the water tubes is \$60.

- b. All sales are on account. Based on past experience, sales are expected to be collected in the following pattern:

- 50% in the month of sale
- 45% in the month following sale
- 5% uncollectible

The beginning accounts receivable balance (excluding uncollectible amounts) on July 1 will be \$160,000.

c. The company maintains finished goods inventories equal to 20% of the following month's sales. The inventory of finished goods on July 1 will be 1,300 units.

d. Each water tube requires 3 kilograms of synthetic polyisoprene rubber compound. To prevent shortages, the company would like the inventory of synthetic rubber compound on hand at the end of each month to be equal to 20% of the following month's production needs. The inventory of synthetic rubber compound on hand on July 1 will be 3,720 kilograms.

e. The synthetic rubber compound costs \$3.50 per kilogram. Water Sport pays for 70% of its purchases in the month of purchase; the remainder is paid for in the following month. The accounts payable balance for synthetic rubber compound purchases will be \$11,400 on July 1.

Required:

- i. Prepare a sales budget, by month and in total, for the third quarter. (Show your budget in both units of water tubes and dollars.) Also prepare a schedule of expected cash collections, by month and in total, for the third quarter.
 - ii. Prepare a production budget for each of the months July through October.
 - iii. Prepare a direct materials purchases budget for synthetic rubber compound, by month and in total, for the third quarter. Also prepare a schedule of expected cash disbursements for synthetic rubber compound, by month and in total, for the third quarter.
5. a) In a joint processing operation, AB company manufactures three grades of sugar from a common input, sugar cane. Joint processing costs up to the split-off point total \$80,000 per year. The company allocates these costs to the joint products on the basis of their total sales value at the split-off point. These sales values are as follows: raw sugar, \$40,000; brown sugar, \$40,000; and white sugar, \$42,000. Each product may be sold at the split-off point or processed further. Additional processing requires no special facilities. The additional processing costs and the sales value after further processing for each product (on an annual basis) are shown below:

(10)
(CO3)
(PO11)

Product	Additional Processing Costs	Sales Value
Raw sugar	\$42,000	\$80,000
Brown sugar	\$28,000	\$70,000
White sugar.	\$12,000	\$82,000

Required: Which product or products should be sold at the split-off point, and which product or products should be processed further? Show computations.

- b) At the XY Company's current activity level of 8,000 units per month, the costs of producing and selling one unit of the company's only product are as follows:

(15)
(CO3)
(PO11)

Direct materials	\$2.50
Direct labour	\$3.00
Variable manufacturing overhead	\$0.50

Fixed manufacturing overhead.	\$4.25
Variable selling and administrative expenses	\$1.50
Fixed selling and administrative expenses	\$2.00

The normal selling price is \$15 per unit. The company's capacity is 10,000 units per month. An order has been received from a potential customer overseas for 2,000 units at a price of \$12.00 per unit. This order would not affect regular sales.

Required:

- i. If the order is accepted, by how much will monthly profits increase or decrease? (The order would not change the company's total fixed costs.)
- ii. Assume the company has 500 units of this product left over from last year that are inferior to the current model. The units must be sold through regular channels at reduced prices. What unit cost is relevant for establishing a minimum selling price for these units? Explain.

6. a) Dawson Company is considering making a capital expenditure for a project that would have an eight-year life and require a \$2,400,000 investment in equipment. At the end of eight years, the project would terminate and the equipment would have no salvage value. The project would provide operating income each year as follows:

(15)
(CO3)
(PO11)

Sales	\$3,000,000
Variable expenses.	<u>1,800,000</u>
Contribution margin.	1,200,000
Fixed expenses:	
Advertising, salaries, and other fixed out-of-pocket costs	\$700,000
Depreciation.	<u>300,000</u>
Total fixed expenses.	<u>1,000,000</u>
Operating income.	\$ 200,000

The company's discount rate is 12%. Required:

- i. Compute the net annual cash inflow from the project.
- ii. Compute the project's net present value. Is the project acceptable?
- iii. Find the project's IRR to the nearest whole percentage point.
- iv. Compute the project's payback period. 5. Compute the project's simple rate of return.

- b) The management of Deitrich Inc., a civil engineering design company, is considering an investment in a high-quality blueprint printer with the following cash flows:

(05)
(CO3)
(PO11)

Year	Investment	Cash Inflow
1	\$28,000	\$2,000
2	\$ 4,000	\$3,000
3		\$6,000
4		\$8,000
5		\$9,000
6		\$8,000
7		\$6,000
8		\$5,000
9		\$4,000
10		\$4,000

Required:

- i. Determine the payback period of the investment.
 - ii. Would the payback period be affected if the cash inflow in the last year was several times as large?
- c) How the Weighted-Average Cost of Capital (WACC) works as a Screening Tool in capital budgeting decisions? Explain.

(05)
(CO3)
(PO11)