1. Answer each of the following independent questions, and show your computations if any. (25%)

(1) Kraven Corporation produced 1,000 units of a product in 2024 that required 25,000 pounds of material. The price for the material was $3 per pound in 2024 and $3.25 in 2023. Kraven's cost accountant has estimated that to produce the same 1,000 units in 2023 would have required 29,700 pounds of material. What was the cost effect of productivity for materials? (Use "F" to represent favorable variance and "U" to represent unfavorable variance).

(2) TSMC Company is in the process of evaluating a new part, PS2002, using the following information. PS2002 has one production run each month, each with $18,000 in setup costs. PS2002 incurred $40,000 in development costs and is expected to be produced over the next three years. Direct costs of producing PS2002 are $56,000 per run of 24,000 parts each.　Indirect manufacturing costs charged to each run are $88,000. Destination charges for each run average $15,000. PS2002 is selling for $14 in Taiwan and $25 in all other countries. Sales are one-third domestic and two-thirds exported. Sales units equal production units each year.

Requirement:
(a) What are the estimated life-cycle revenues?
(b) What is the estimated life-cycle operating income for the first year?

(3) Falcon Company produces jackets. In 2024, the company experienced a computer failure and some of the data were lost and could not be recovered. The data the company were able to recover are shown below, where "F" refers to favorable variance and "U" refers to unfavorable variance:

Direct materials used	800,000 sq. yds.
Direct materials purchased	820,000 sq. yds.
Direct materials price variance	$ 24,600 F
Direct materials efficiency variance	$ 16,000 U
Direct manufacturing labor price variance	$ 26,500 U
Direct manufacturing labor efficiency variance	$ 30,000 U
Standard price of direct materials	$ 2 per sq. yd.
Standard quantity of direct materials per jacket	1.2 sq. yds.
Actual direct manufacturing labor cost	$ 7,976,500
Actual direct manufacturing labor rate	$ 15.05/hr

Calculate the following:
(a) Actual price per square yard of direct materials.
(b) Actual quantity of jackets produced.
(c) Actual direct manufacturing labor hours worked.
(d) Standard direct manufacturing labor rate.
(e) Standard direct manufacturing labor hours per shirt.

2. Answer each of the following independent questions, and show your computations if any. (25%)

(1) Coolman is a manufacturer of sportswear. It produces all of its products in one department. The company uses weighted-average method under the process costing system. The information for the current month is as follows:

Beginning work in process	22,000 units
Units started	44,000 units
Units completed	55,000 units
Ending work in process	10,000 units
Spoilage	1,000 units
Beginning work-in-process direct materials	$15,000
Beginning work-in-process conversion	$ 6,000
Direct materials added during month	$70,800
Direct manufacturing labor during month	$37,400

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.

Requirement:

(a) Prepare a production cost worksheet if spoilage is recognized.

(b) Distinguish among spoilage, rework, and scrap.

(2) The NTPU Company manufactures tables. In March, the two production departments had budgeted allocation bases of 4,000 machine-hours in Assembly Department and 8,000 direct manufacturing labor-hours in Quality Control Department. The budgeted manufacturing overheads for the month were $57,500 and $62,500, respectively. For Job A, the actual costs incurred in the two departments were as follows:

	Assembly Department	Quality Control Department
Direct materials purchased on account	$110,000	$177,500
Direct materials used	32,500	13,500
Direct manufacturing labor	52,500	53,500
Indirect manufacturing labor	11,000	9,000
Indirect materials used	7,500	4,750
Lease on equipment	16,250	3,750
Utilities	1,000	1,250

Job A incurred 800 machine-hours in Assembly Department and 300 manufacturing labor-hours in Quality Control Department. The company uses a budgeted overhead rate for applying overhead to production.

Requirement:

(a) Prepare the necessary journal entries to summarize the March transactions for Assembly Department.

(b) Determine the total cost of Job A.

3. ELO Company is considering the purchase of new equipment that will reduce labor costs. ELO made the following estimates related to the new equipment:

Cost of the equipment	$ 120,000
Reduced annual labor costs	$ 50,000
Estimated life of the equipment	3 years
Terminal disposal value	$ 0
Tax rate	30%
Cost of capital	10%

Assume depreciation is calculated on a straight-line basis. All cash flows occur at the end of the year except for the initial investment amounts.

Required:

(1) What is the increase in the annual cash flow from investing the equipment? (8%)

(2) What is the net present value of the project? (8%)

(3) Calculate the accrual accounting rate of return based on average investment. (8%)

4. Taipei Company produces two products: X and Y. It takes 1 hour of machine A and 1 hour of machine B to produce a X; and it takes 1 hour of machine A and 2 hours of machine B to produce a Y. The capacities of A and B are 300 hours and 400 hours, respectively. The contribution margins of X and Y are $8 and $10, respectively. Taipei cannot produce more than 150 units of Y.

Required:

(1) Construct a linear programming model of Taipei's product mix problem. (8%)

(2) What is Taipei's optimal product mix? (8%)

(3) What are the shadow prices of A and B. (10%)