1. Not-Average-Cookie Company manufactures and sells three flavors of cookies: Macaroon, Sugar, and Buttercream. The batch size for the cookies is limited to 1,000 cookies based on the size of the ovens and cookie molds owned by the company. Based on budgetary projections, the information is listed below:

	Sugar	Macaroon	Buttercream
Projected sales in units	500,000	800,000	600,000
PER UNIT data:			
Selling price	$0.80	$0.75	$0.60
Direct materials	$0.20	$0.15	$0.14
Direct labor	$0.04	$0.02	$0.02

Total fixed overhead = $360,000

Required:

(a) Given the projected sales mix, how many cookies of *each flavor* should the company sell to achieve a target net income of $13,824? The income tax rate is 40%. **(15%)**

(b) Now the company is considering switching overhead allocation system from a traditional system (with direct labor hours as the overhead allocation base) to an activity-based costing system. Total overhead costs and the activity levels for the year are estimated as follows:

Hours per 1000-unit batch:			
Direct labor hours	2	1	1
Oven hours	1	1	1
Packaging hours	0.5	0.5	0.5

Activity	Overhead costs	Activity levels
Direct labor		2,400 hours
Oven	$210,000	1,400 oven hours
Packaging	$150,000	1,000 packaging hours
	$360,000	

Calculate how much more or less estimated operating profit per thousand Sugar cookies under the activity-based costing system relative to the traditional system. **(10%)**

2. McKenny is in the process of evaluating its new client services for the business consulting division. The following shows projected data for this new service:
   - Estate planning, a new service, will incur $100,000 in development costs and employee training in the first year.
   - The direct labor costs of providing this service are estimated to be on average $27 per hour.
   - Customer service expenses are estimated to be $95 per consulting job, with each job lasting 300 hours for Client Elsa and 100 hours for Client Anna.
   - Other costs for this new service are estimated at $400,000 per year, classified as fixed costs.
   - The estate planning service program is expected to last for two years. Afterwards, a new law will be in place that will require new operating guidelines for estate consulting.
   - The current staff expects to bill Client Elsa 30,000 hours and Client Anna 10,000 hours for each of the two years when the program is in effect. Billing for each customer will be $42 per hour.

One year later, McKenny found the actual estate planning service data to be the following:
- The development costs and employee training incurred $80,000.

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- The direct labor costs averaged $28 per hour, and other fixed costs incurred $500,000.
- Customer service expenses averaged $92 per consulting job, with each job lasting 200 hours for Client Elsa and 200 hours for Client Anna.
- The staff billed Client Elsa 25,000 hours and Client Anna 25,000 hours with an average billing rate of $45 per hour.

Required:

(a) What is the estimated life-cycle operating income for the first two years of the estate planning service? **(10%)**

(b) Calculate *direct labor price variance*, *sales-mix revenue variance for Client Elsa*, and *static variance in operating income* for the first-year-service. **(15%)**

3. Bestty Company is a paint manufacturer with two departments: mixing and finishing. The company uses the FIFO method of process costing. The following data were recorded for the finishing department:

Units of beginning work-in-process inventory	25,000
Percentage completion of beginning work-in-process units	25%
Units started	175,000
Units completed	125,000
Units in ending work-in-process inventory	50,000
Percentage completion of ending work-in-process units	95%
Spoiled units	25,000
Total costs added during current period:	
Direct materials	$ 1,638,000
Direct manufacturing labor	$ 1,589,000
Manufacturing overhead	$ 1,540,000
Work-in-process, beginning:	
Direct materials	$ 0
Transferred-in costs	$ 207,250
Conversion costs	$ 105,000
Cost of units transferred in during current period	$ 1,618,750

Conversion costs are added evenly during the process. Direct material costs are added when production is 90% complete. The inspection point is at the 80% stage of production. Normal spoilage is 10% of all good units that pass inspection. Costs of normal spoilage are assigned to all good units passing inspection. Spoiled units have zero disposal value.

Required: Determine the total costs of good units completed and transferred out (including normal spoilage) for the finishing department. **(10%)**

4. Weston Corporation is well-known for manufacturing high-quality auto parts for two leading Japanese automakers. The company's management accountant, Nancy Evans, provided the following cost of quality report of the last year:

Testing of purchased materials	$48,000
Quality control training for production staff	7,500
Warranty repairs	123,000
Quality design engineering	72,000
Customer support	55,500
Materials scrap	18,000
Product inspection	153,000
Engineering redesign of failed parts	31,500
Rework of failed parts	27,000

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Chris Sheldon, the general manager of one of the company's largest manufacturing plants, is considering initiating a new quality control program beginning from this year. The new program requires investment of a new inspection machine which has an up-front cost of $100,000. The use of the new machine will reduce the rework costs by 5% annually, reduce the customer support and warranty repairs by 10% annually, and yield incremental margins of $28,000 per year due to increased sales. However, after the machine investment the quality control training costs will increase by $15,000 in the first year. All other quality costs will not change.

Weston faces a 30% income tax rate. It depreciates assets on a straight-line basis (to terminal value) for both financial reporting and tax purposes. Chris expects the life span of this new machine to be 4 years and a terminal disposal value of $20,000. The required rate of return on investments is 12%.

Required:

(a) Calculate the sum of appraisal costs and internal failure costs in the first year after investment of this new machine. **(5%)**

(b) Calculate the NPV of this new machine investment. Use three decimals for the discount factor. **(10%)**

5. Rainbow Company has seven production departments, with each department responsible for one product line. Each department can sell its product to outside customers or other departments within the company. The company has a policy that requires internal transfer unless it is impossible, and the transfer price is set to be 115.2% of the full production cost of the selling department. The Green Department's product requires material X, which can be purchased from the Blue Department. However, X can be replaced by a similar material X2 that can be purchased from an outside vendor at $120 per unit. The market price of material X is $117 per unit. The product of the Green Department has a selling price of $350 per unit. Last year the Green Department's material X demand was 50% of the capacity of the Blue Department which was operating under full capacity. The invested capital of each department was $800,000 in Blue Department and $600,000 in Green Department. The company has a required rate of return of 10%. The income statement data of the two departments were as follows:

	Blue Department		Green Department	
Sales units		12,000		6,000
Sales revenue		$ 1,350,000		$ 2,100,000
Direct materials*	$ 489,000		$ 930,000	
Direct labor	240,000		300,000	
Manufacturing overhead				
Variable	132,000		150,000	
Fixed	264,000	1,125,000	360,000	1,740,000
Gross profit		$ 225,000		$ 360,000
Fixed selling expenses		140,000		216,000
Operating income		$ 85,000		$ 144,000

*Costs of the Green Department include the material costs transferred from the Blue Department.

Due to increased product demand, this year the Green Department expanded its product line and invested an additional capital of $900,000. The demand for material X reached 90% of the Blue Department's capacity. The fixed manufacturing overhead increased to $500,000, and the selling expenses increased to $350,000. All other costs did not change. On the other hand, the Blue Department has no capacity expansion plan due to technology constraint. This year the department's costs and sales volume remained the same as the last year.

Required:

(a) Under the current transfer pricing policy, calculate the residual income of each department for this year. Suppose the Green Department can obtain all material X needed and all products can be sold at the same selling price as the last year. **(10%)**

(b) If the company's policy allows each department to negotiate the transfer price and the transfer quantity is 10,800 units, determine the minimum transfer price acceptable by the Blue Department to achieve the

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company's required rate of return. Round the answer to the second decimal place. **(5%)**

6. Fowler Industries produces two bearings: C15 and C19. Data regarding these two bearings follow.

	C15	C19
Machine hours required per unit	2.00	2.50
Labor hours required per unit	6.25	5.00
Standard cost per unit		
Direct material	$ 2.50	$ 4.00
Direct labor	5.00	4.00
Variable manufacturing overhead*	3.00	3.50
Fixed manufacturing overhead**	4.00	5.00
Total	$14.50	$16.50

*Variable overhead is allocated based on direct labor hours
**Fixed overhead is allocated based on machine hours

The company requires 8,000 units of C15 and 11,000 units of C19 annually. Recently, management decided to devote additional machine time to other product lines, resulting in only 31,000 machine hours per year that can be dedicated to production of the bearings. An outside company has offered to sell Fowler the bearings at prices of $13.50 for C15 and $15.00 for C19. All variable costs can be saved if the product is purchased. The annual storage cost per unit of inventory is $5, and the ordering cost is $50 per purchase order. The purchasing lead time is 2 weeks. The company requires 20% rate of return on investment.

Required: Determine the economic order quantity for the product that should be purchased. **(10%)**

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