



INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

End-Autumn Semester Examination 2023-24

Date of Examination: 22.11.2023 Session: AN Duration: 3 Hrs Full Marks: 90

Subject No. : EP 61203 Subject : Financial and Legal Aspects of New Technology Ventures

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Special Instructions (if any): Answer all questions. Make necessary assumptions, if required.

1. (i) The following production, cost, and pricing data are available:

Units in beginning inventory	0
Units produced	12,000
Units sold	10,000
Sales price per unit	₹1,100
Variable costs per unit:	
Direct materials	₹350
Direct labor	200
Manufacturing overhead	100
Selling and administrative	50
Fixed costs in total:	
Manufacturing overhead	₹18,00,000
Selling and administrative	25,00,000

Calculate the cost per unit, using absorption costing and variable costing.

[7 marks]

(ii) Mike's Motorcycles has enjoyed several years of business success, but recently the company has seen some indications of a slowdown in sales. The company's owner has decided to increase the advertising budget by 10% and reduce sales prices by 4%. The following partial income statement shows the company's results for the most recent quarter:

Mike's Motorcycles Partial Income Statement	
Sales	₹4,00,00,000
Less: Variable costs	<u>2,80,00,000</u>
Contribution margin	1,20,00,000
Less: Fixed costs	<u>87,50,000</u>
Net operating income	<u>₹32,50,000</u>

Assuming that the advertising budget was ₹15,00,000 for the quarter and was included in the fixed costs, calculate Mike's Motorcycles' new net income or loss if the changes are made. You should assume that the variable costs will not change if Mike implements the preceding changes.

[3 marks]

2. Posey Manufacturing has the following cost information available for 2022:

Direct materials	₹300 per unit
Direct labor	₹200 per unit
Variable manufacturing overhead	₹100 per unit
Variable S&A costs	₹50 per unit
Fixed manufacturing overhead	₹40,00,000
Fixed S&A costs	₹12,50,000

During 2022, Posey produced 12,500 units, out of which 11,000 were sold for ₹3,000 each.

- Produce an income statement using variable costing
- Produce an income statement using absorption costing.
- If Posey needs to take one of these income statements to the bank to apply for a loan, which one should he use? Why?
- For internal decision making, which income statement would be more useful? Why? [10 marks]

3. Tip Top Company sells umbrellas suited for small and large picnic tables. Based on the advice of its accountant, Tip Top is considering whether to adopt an activity-based costing system. To evaluate the possible impact on cost, the company has accumulated the following data from last year:

Activity	Allocation Base	Overhead Cost
Purchasing	Number of purchase order	₹ 1,50,00,000
Receiving	Number of shipments received	75,00,000
Sales	Number of sales orders	75,00,000

The numbers of activities for small and large umbrellas were as follows:

	Small	Large
Purchase orders	10,000	5,000
Shipments received	12,500	7,500
Sales orders	8,500	6,500

- Calculate the overhead rates for the following activities: purchasing, receiving, and sales.
- Calculate the amount of overhead in Rs., that should be assigned to small and large umbrellas for each of the three activities. [9 marks]

4. Don Waller and Company sells canisters of three mosquito repellent products: Citronella, DEET, and Mean Green. The company has annual fixed costs of ₹1,30,00,000. Last year, the company sold 5,000 canisters of its mosquito repellent in the ratio of 1:2:2. Waller's accounting department has compiled the following data related to the three mosquito repellants:

	Citronella	DEET	Mean Green
Price per canister	₹550	₹750	₹850
Variable costs per canister	300	600	800

- A. Calculate the total number of canisters that must be sold for the company to break even.
- B. Calculate the number of canisters of Citronella, DEET, and Mean Green that must be sold to break even.
- C. How might Don Waller and Company reduce its break-even point? [8 marks]

5. (i) Philadelphia Physicians is considering the replacement of an old billing system with new software that should save Rs. 5,000 per year in cash operating costs. The old system has zero disposal value, but it could be used for the next 12 years. The estimated useful life of the new software is 12 years and it will cost Rs. 30,000. The minimum desired rate of return is 10%.

- A. What is the payback period?
- B. Compute NPV
- C. Management is unsure about the useful life. What would be the NPV if the useful life were (i) 5 years instead of 12 or (ii) 20 years instead of 12?
- D. Suppose the life will be 12 years, but the savings will be Rs. 3,500 per year instead of Rs. 5,000. What would be the NPV?
- E. Suppose the annual savings will be Rs. 4,000 for eight years. What would be the NPV? [10 marks]

(ii) A pharma company wishes to value an opportunity to invest in research and development for a new drug. One year later:

- If the research goes well sales will generate cash flows of \$180 million.
- If the research goes poorly, sales will equal \$60 million.

Each scenario is equally likely. The project's cash flows have a discount rate of $r=20\%$.

What is the PV of this project? [3 marks]

(iii) An investment costs Rs. 1,54,800 and pays Rs. 13,800 in perpetuity. If the interest rate is 9%, what is the NPV? [2 marks]

6. (i) 'All illegal agreements are void but all void agreements are not illegal.' Bring out the difference between void and illegal agreement. Give examples.
 (ii) 'No consideration, no contract'. Do you agree? Explain
 (iii) Can a person who is usually of unsound mind, but occasionally of sound mind, make a contract?
 (iv) What is a contract of indemnity? Bring out the difference between a contract of indemnity and guarantee. [8 marks]
7. (i) When consent is said to be free? [5 marks]
 (ii) State in brief about patent, trade mark and copyright. [5 marks]
 (iii) What are the different modes of discharging a contract? Discuss in brief. [10 marks]

8. (i) X offered a reward to anyone who would restore him his lost dog. Y brought the dog to X without any knowledge of the offer of reward. Can Y claim the reward?
- (ii) X promises to obtain for Y an employment in the public services and Y promises to pay Rs. 50,000. Decide the validity of the agreement.
- (iii) A minor sold some goods on credit to an adult. The buyer on due date refuses to pay the price. Can the minor recover the amount?
- (iv) A delivers a horse to B on trial for a week. The horse dies on the fourth day without any negligence on part of B. Is B liable to pay the price?
- (v) X sold a horse to Y knowing well that the horse is vicious. X did not disclose the nature of the horse. Y got injured while riding the horse. Is X guilty of fraud? [10 marks]