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Question Paper	
SCMPE	**Duration**: 65
Details: Test – 3	**Marks**: 35

Instructions:

- All the questions are compulsory
- Properly mention test number and page number on your answer sheet, Try to upload sheets in arranged manner.
- In case of multiple choice questions, mention option number only Working notes are compulsory wherever required in support of your solution
- Do not copy any solution from any material. Attempt as much as you know to fairly judge your performance.

Q1:- Marketing manager of Arnav Ltd. has conducted a research on the price-demand relationship for its consumer durable product 'Leo-9', Leo-9 is recently launched product. The price-demand pattern will be as follows:

Price per unit (Rs.)	Demand (units)
11,100	1,000
10,700	2,000
9,600	3,000
8,700	4,000

Leo-9 is produced in batches of 1,000 units. Production manager of Arnav Ltd. has also research, and studied the production pattern and has believe that 50% of the variable manufacturing cost would have learning and experience curve effect. This learning & experience curve effect will continued upto 4,000 units of production at a constant rate. But after 4,000 units of production, unit variable manufacturing cost would be equal to the unit cost at the 4^{th} batch. The manufacturing unit, cost of the first batch will be Rs. 4,400 of which only 50% is subjected to learning and experience curve effect. The average unit variable cost of all 4 batches will be Rs. 4,120.

Required

(i) Calculate the rate of learning that has been expected by the Production manager.

(ii) Calculate the price at which Arnav Ltd. should sell the Leo-9 in order to maximize contribution.

Note: log0.93 = -0.0315, log2 = 0.3010, $2^{-0.1047}$= 0.9299, $3^{-0.1047}$ = 0.8913, $4^{-0.1047}$= 0.8649

(6 Marks)

Q2:- Golden Pacific Airlines Ltd. operates its services under the brand 'Golden Pacific'. The 'Golden Pacific' route network spans prominent business metropolis as well as key leisure destinations across the Indian subcontinent. 'Golden Pacific', a low-fare carrier launched with the objective of commoditizing air travel, offers airline seats at marginal premium to train fares across India.

Profits of the 'Golden Pacific have been decreasing for several years. In an effort to improve the company's performance, consideration Is being given to dropping several flights that appear to be unprofitable.

Income statement for one such flight from 'New Delhi' to 'Leh' (GP-022) is given below (per flight):

	Rs.	Rs.
Ticket Revenue (175 seats × 60% Occupancy × Rs. 7,000 ticket price)		7,35,000
Less: variable Expenses (Rs. 1,400 per person)		147,000
Contribution Margin		588,000
Less: Flight Expenses:		
Salaries, Flight Crew	1,70,000	
Salaries, Flight Assistants	31,500	
Baggage Loading and Flight Preparation	63,000	
Overnight Costs for flight crew and Assistants at destination	12,600	
Fuel for Aircraft	2,38,000	
Depreciation on Aircraft	49000*	

Liability Insurance	1,47,000	
Flight Promotion	28,000	
Hanger parking fee for Aircraft at destination	7,000	7,46,100
Net Gain/(Loss)		(1,58,100)

*Based on obsolescence

The following additional information is available about flight GP-022.

1. Members of the flight crew are paid fixed annual salaries, whereas the flight assistants are paid by the flight.
2. The baggage loading and flight preparation expense is an allocation of ground crew's salaries and depreciation of ground equipment.
3. One third of the liability insurance is a special charge assessed against flight GP-022 because in the opinion of insurance company, the destination of the flight in a "high-risk' area.
4. The hanger parking fee is a standard fee charged for aircraft of all airports.
5. if flights GP-022 is dropped,' Golden Pacific' Airlines has no authorization at present to replace it with another flight

Required

Using the data available, prepare an ANALYSIS showing what impact dropping flight GP- 022 would have on the airline's profit.

(5 Marks)

Q3:- Rohni Steel Company produces three grades of steel –super, good and normal grade. Each of these products (Grades) has high demand in the market and company is able to sell as much as it can produce these products.

The furnance operation is a bottleneck in the process. The company is running at 100% of capacity. The company wants to improve its profitability. The variable conversion cost is Rs. 100 per process hour. The fixed cost is Rs. 48,00,000/-. In addition, the Cost Accountant was able to determine the following information about the three products (grades):

	Super Grade	**Good Grade**	**Normal Grade**
Budgeted Units produced	6,000	6,000	6,000
Total process hours per unit	12	12	10
Furnace hours per unit	6	5	4
Unit Selling Price	Rs. 3,600	Rs. 3,400	Rs. 3,000
Direct Material cost per unit	Rs. 2,100	Rs. 1,900	Rs. 1,720

The furnace operation is part of the total process for each of these three products. Thus furnace hours are the part of process hours.

Required

(i) DETERMINE the unit contribution margin for each product

(ii) Give an ANALYSIS to determine the relative product profitability, assuming that the furnace is a bottleneck.

(iii) Managements wishes to improve profitability by increasing prices on selected products. At what price would super and good grades need to be offered in order to produce the same relative profitability as normal grade steel?

(8 Marks)

Q4:- Forward and Foundry Ltd. is feeling the effects of a general recession in the industry. Its budget for the coming half year is based on an output of only 500 tones of casting a month which is less than half of its capacity. The prices of casting vary with the composition of the metal and the shape of the mould, but they average Rs. 175 a tone. The following details are from the Monthly Production Cost Budget at 500 tone levels:

Particulars	**Core making**	**Melting and Pouring**	**Moulding**	**Cleaning and Grinding**
	Rs.	**Rs.**	**Rs.**	**Rs.**
Labour	10,000	16,000	6,000	4,500
Variable overhead	3,000	1,000	1,000	1,000
Fixed overhead	5,000	9,000	2,000	1,000
	18,000	26,000	9,000	6,500
Labour and O.H. rate per direct labour hour	9.00	6.50	6.00	5.20

Operation at this level has brought the company to the brink of break-even. It is feared that if the lack of work continues, the company may have to lay off some of the most highly skilled workers whom it would be difficult to get back when the volume picks up later on. No wonder, the work's Manager at this Juncture, welcomes an order for 90,000 casting, each weighing about 40 lbs., to be delivered on a regular schedule during the next six months. As the immediate concern of the Works Manager is to keep his work force occupied, he does not want to lose the order and is ready to recommend a quotation on a no-profit and no-loss basis.

Materials required would cost Rs. 1 per casting after deducting scrap credits. The direct labour hour per casting required for each department would be:

Core making	0.09
Melting and Pouring	0.15
Moulding	0.06
Cleaning and Grinding	0.06

Variable overheads would bear a normal relationship to labour cost in the melting and pouring department and in the moulding department. In core making, cleaning and grinding however, the extra labour requirements would not be accompanied by proportionate increases in variable overhead. Variable overhead would increase by Rs. 1.20 for every additional labour hour in core making and by 30 paisa for every additional labour hour in cleaning and grinding. Standard wage rates are in operation in each department and no labour variances are anticipated.

To handle an order as large as this, certain increases in factory overheads would be necessary amounting to Rs. 1,000 a month for all departments put together. Production for this order would be spread evenly over the six months period.

You are required to:

(a) Prepare a revised monthly labour and overhead cost budget, reflecting the addition of this order.

(b) Determine the lowest price at which quotation can be given for 90,000 castings without incurring a loss.

(8 Marks)

Q 5:- An agricultural has 480 hectares of land on which he grows potatoes, tomatoes, peas and carrots. Out of the total area of land, 340 hectares are suitable for all the four vegetables but the remaining 140 hectares of land are suitable only for growing peas and carrots. Labour for all kinds of farm work is available is plenty.

The market requirement is that all the four types of vegetables must be produced with a minimum of 5000 boxed of any one variety. The farmer has decided that the area devoted to any crop should be in terms of complete hectares and not in fractions of a hectare. The only other limitation is that not more than 113750 boxes of any one vegetable should be produced.

The relevant data concerning production, market prices and costs are as under:

	Potatoes	**Peas**	**Carrots**	**Tomatoes**
Annual yield:				
Boxes per hectare	350	100	70	180
Costs:				
Direct material per hectare	Rs. 952	Rs. 432	Rs. 384	Rs. 624
Direct labour:				
Growing per hectare	1792	1216	744	1056
Harvesting and packing per box	7.2	6.56	8.8	10.4
Transport per box	10.4	10.4	8	19.2
Market price per box	30.76	31.74	36.8	44.55

Fixed expenses per annum:

Growing	Rs. 124000
Harvesting	Rs. 75000
Transport	Rs. 75000
General administration	Rs. 150000

It is possible to make the land presently suitable for peas and carrots, viable for growing potatoes and tomatoes if certain land development work is undertaken. This work will involve a capital expenditure of Rs. 6000 per hectare which a bank is prepared to finance at the rate of interest of 15% p.a. If such improvement is undertaken, the harvesting cost of the entire crop of tomatoes will decrease on an average by Rs.2.60 per box.

Required:

(i) Calculate, within the given constraints, the area to be cultivated in respect of each crop to achieve the largest total profit and the amount of such total profit before land development work is undertaken.

(ii) Assuming that the order constraint continues, advise the grower whether the land development scheme should be undertaken and if so, the maximum total profit that would be achieved after the said development scheme is undertaken.

(8 Marks)