(a) Relevant costs of using the machine for the order

		Rs.
(i)	Loss in the net realisable value of machine by using it (Rs.8,000 –	500
	Additional maintenance and repair for two months, i.e., (60 – 40) × 2	40
(ii)	Minimum price	540

Notes

(i) Books value of Rs.8,400 is irrelevant for decision.

(ii) Net realisable value of the machine fall from Rs.8,000 to Rs.7,500. This loss of Rs.500 is relevant for decision, because it is influenced exclusively by the decision.

(iii) Rs.7,500 will be realised after months at least. Therefore, time value of Rs.7,500 for two months atleast. Therefore, present value of future realisable value of Rs.7,500 should be found out and this present value should be deducted from Rs.8,000. This will be the correct relevant cost in place of Rs.500 shown above in the absence of discounting factor.

Evaluation of the offer

Relevant Revenue			22,000
(-) Relevant Cost			
Material A	1,000 units × 6	6,000	
Material B	1,000 units × 5	5,000	
Material C	700 units × 2.5	1,750	
Material C	300 units × 4	1,200	
Material D	300 units × 5	1,500	
Other expenses		550	(16,000)
Relevant Gain			6,000

Contract should be accepted

NOTES:

(i) Material A is not yet owned. It would have to be purchased in full at the replacement cost of Rs.6.00 per unit. Relevant cost is therefore 1,000 units at the replacement Cost.

(ii) Material B is used by the company regularly. There is already existing a stock of 600 units. If these are used in the contract, a further 400 units would have to be purchased. Relevant cost is therefore 1,000 units at the replacement Cost.

(iii) Material C: 1,000 units of material C are required. 700 units are already in stock. If it is used for the contract, a further 300 units will have to be purchased at a replacement cost of Rs.4.00 each. The existing stock of 700 units will not be replaced. If they are used for the contract, they cannot be sold @ Rs. 2.50 each unit. The realisable value of these units 700 units @ Rs.2.50 per unit represent opportunity cost.

(iv) Material D is already in stock and will not be replaced. There is an opportunity cost of using D in the contract. It has following two uses:It can be sold to fetch Rs.1,200 i.e., 200 × Rs.6. It can also be used for E, which would cost Rs.1,500 i.e., 300 × Rs.5. Since substitution is more useful, Rs.1,500 is the opportunity cost.

Minimum price to be quoted (Relevant Cost)	**Rs.**
Cost to be incurred	29,700
Direct Materials	2,250
Direct Wages - Dept A	1,800
Direct Wages - Dept B	10,500
Variable overheads	1,075
Delivery Cost	1,350
Supervisory overtime	1,050
(-) sale of control device (10500 - 120 - 30)	(10,350)
Material Cost (12000-240-60)	11,700
Scrap Lost	11,400
Drawing amount lost	1,500
	61,975

Calculation of Minimum Price for the Special Job

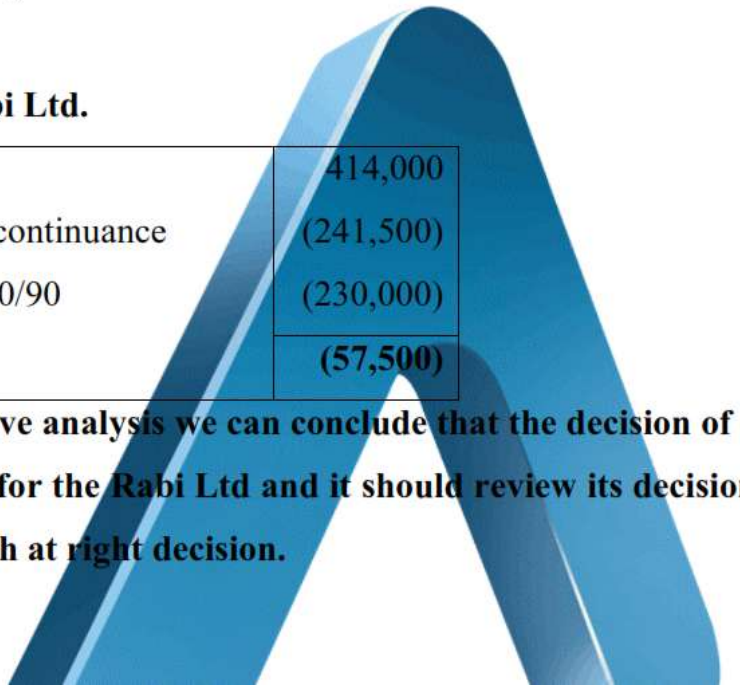
G1 labour (250 - 150) x 15	1500
G2 labour (excess Hours available)	NIL
(-) Disposal Cost saved of Material R1	(1250)
Minimum Price for the Special Job	Rs.250.

As given in the problem Rabi Ltd. is considering to discontinue the Division C perhaps by seeing the Division C's income as it is a loss of Rs.1,72,500. Discontinuance of Division C might be saving Rs.4,14,000 on specific fixed costs to the company but due to this decision company will not only be losing Rs.2,41,500 contribution from the Division C but also an additional burden of variable cost of Rs.2,30,000 to Divisions A & B and Rabi Ltd. as a whole.

Evaluation of decision of the Rabi Ltd.

Specific Fixed Cost Saved	414,000
Loss/ Increase in Cost Due to Discontinuance	(241,500)
Loss of Contribution 2070000 x 10/90	(230,000)
Excess of Loss Over Savings	**(57,500)**

In a nutshell considering the above analysis we can conclude that the decision of discontinuing Division C will not be beneficial for the Rabi Ltd and it should review its decision on the basis of relevant cost approach to reach at right decision.



Calculation of NPV

	A	B	C
PV of Inflows			
Sell land Now	1,00,000		
Sell land after 25 years (1,50,000 & 3,00,000 x 0.092)		13,800	27,600
Rent (8000 & 110000 x 9.077)		72,616	9,98,470
(-) PV of OUTFLOWS			-10,00,000
NPV	**1,00,000**	**86,416**	**26,070**

The first alternative, namely, to sell now yields the highest net present value and hence it is acceptable.

Evaluation of the Proposals

Profit Statement When Product Y is Discontinued

In case Product Y is discontinued, Product X will also have to bear the Fixed Expenses previously borne by Product Y. The final position will be as follows:

Existing Net Profit of X	Rs. 2,250
Less: Fixed Expenses of Y	Rs. 1,250
Final Net Profit	Rs. 1,000

Profit Statement When the Price of Y is Reduced by 20 per cent (It will result in 40% increase in Demand)

	(Rs.)
Sales (Rs.4,000 × 80/100 × 140/100)	4,480
Less: Direct Costs (Rs.2,000 + 40% of Rs.2,000)	2,800
Less: Indirect Costs- Variable Expenses (Rs.1,000 + 40% of Rs.1,000)	1,400
Less: Fixed Expenses (Old)	1,250
Net Loss	-970
Less: Profit of X (Old)	2,250
Final Net Profit	1,280

Profit Statement When the Price of 'X' is Doubled (this will reduce the Demand by three-fifths or 60%)

	(Rs.)
Sales (Rs.10,000 × 200/100 × 2/5)	8,000
Less: Direct Costs (Rs.4,500 − 60% of Rs.4,500)	1,800
Less: Indirect Costs - Variable Expenses (Rs.2,000 − 60% of Rs.2,000)	800
Contribution	5,400
Less: Fixes Expenses (Old)	1,250
Less: Net Loss of Y (Old)	250
Final Net Profit	**3,900**

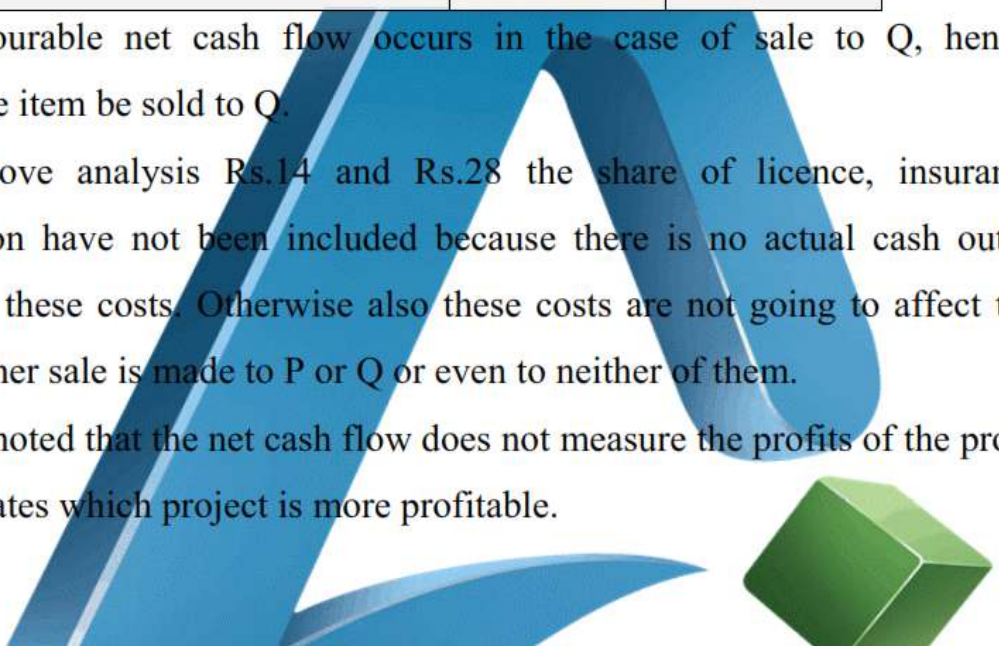
The above analysis shows that the Net Profit is maximum under alternative (3) i.e. when the Price of X is doubled and the Demand reduces by three-fifths. This alternative will increase the present level of Net Profit from Rs.2,000 to Rs.3,900 for a four month period. It is, therefore, suggested that the concern should adopt alternative (3).

	P (Rs.)	Q (Rs.)
Cash inflow (Sales)	200	216
Cash outflow (Petrol, oil and wages)	22	32
Net cash flow	**178**	**184**

Since the most favourable net cash flow occurs in the case of sale to Q, hence it is recommended that the item be sold to Q.

Notes: 1. In the above analysis Rs.14 and Rs.28 the share of licence, insurance and depreciation have not been included because there is no actual cash outflow in respect of these costs. Otherwise also these costs are not going to affect the cash flow whether sale is made to P or Q or even to neither of them.

2. It may be noted that the net cash flow does not measure the profits of the projects. It only indicates which project is more profitable.



(i) Working notes :

	(Rs.)
(1) Overheads for one carton i.e. 24 tubes	54
Therefore, per tube overheads: (Rs. 54/24 tubes)	2.25

Fixed overheads allocated for 3,00,000 tubes: Rs. 4,50,000. Per tube fixed overheads: = Rs. 1.50.
Therefore variable overheads, per tube {Rs. 2.25 – Rs. 1.50} = Rs. 0.75

	(Rs.)
(2) Direct wages per carton	72
(3) Therefore, direct wages per tube : (Rs. 72/24 tubes)	3
(4) Direct materials per carton	108
Therefore, direct materials per tube : (Rs. 108/24 tubes)	4.50

(4) Cost of making one empty tube:

	Cost per tube of EMO (Rs.)	% of cost in respect of empty tube	Cost of empty tube (Rs.)	Cost per tube of EMO without empty tube (Rs.)
Direct materials	4.50	20	0.90	3.60
Direct wages	3.00	10	0.30	2.70
Variable overheads	0.75	10	0.075	0.675
	8.25		1.275	6.975

Cost of manufacturing / buying of 300,000 empty tubes of EMO

	Empty tube cost (Rs.)	If empty tubes are made (Rs.)	If empty tubes are purchased (Rs.)
Direct materials	0.90	2,70,000	—
Direct wages	0.30	90,000	—
Variable overheads	0.075	22,500	—
Purchase price	1.35	—	4,05,000
Total		3,82,500	4,05,000

Since manufacturing capacity is available for the manufacture of 3,00,000 empty tubes at a cost of Rs. 3,82,500 whereas the total cost of purchase of tubes is higher, i.e., Rs. 4,05,000, the company should manufacture the empty tubes for a production volume of 3,00,000 EMO tubes.
Beyond 3,00,000 empty tubes, the company has to install a new machine involving a total additional fixed overheads of Rs. 30,000. The cost of making and buying the additional tubes 50,000 and 1,50,000 units of empty tubes will be as under :

	Per tube	Additional empty tubes			
		50,000 tubes		1,50,000 tubes	
	(Rs.)	Make (Rs.)	Buy (Rs.)	Make (Rs.)	Buy (Rs.)
Direct materials	0.90	45,000		1,35,000	—
Direct wages	0.30	15,000		45,000	—
Variable overheads	0.075	3,750		11,250	—
Additional overheads		30,000		30,000	—
Purchase price	1.35	—		—	2,02,500
Total		93,750	67,500	2,21,250	2,02,500

(i) The above statement shows that the cost of buying additional empty tubes at both the levels is lower than the cost of their manufacture. Therefore, if the company increases production to 3,50,000 tubes of EMO, 3,00,000 tubes should be made in the factory and additional 50,000 tubes should be purchased at Rs. 67,500.
If the company increases production to 4,50,000 tubes of EMO, 3,00,000 empty tubes should be made in the factory and additional 1,50,000 tubes should be purchased at a cost of Rs. 2,02,500.

(ii) Additional fixed overheads to be incurred on a new machine: Rs. 30,000. Savings per unit if empty tubes are made in the factory instead of buying: Rs. 1.35 – Rs. 1.275 = Rs. 075
Minimum additional quantity of empty tubes to be made to recover the additional fixed costs:
Rs. 30,000 / 0.075 = 4,00,000 empty bottles.
Thus the company should sell 3,00,000 + 4,00,000 = 7,00,000 tubes of EMO per month to warrant justification for the installation of the new machine for the manufacture of empty tubes.

(iii) Evaluation of the profitability on sale of EMO at the three levels

	Per tube (Rs.)	3,00,000 tubes (Rs.)	3,50,000 tubes (Rs.)	4,50,000 tubes (Rs.)
Sales (Rs. 240/24 tubes)	10	30,00,000	35,00,000	45,00,000
Direct materials	3.60	10,80,000	12,60,000	16,20,000
Direct wages	2.70	8,10,000	9,45,000	12,15,000
Variable overheads	0.675	2,02,500	2,36,250	3,03,750
Empty tubes made	1.275	3,82,500	3,82,500	3,82,500
Empty tubes purchased	1.35	—	67,500	2,02,500
Total costs		24,75,000	28,91,250	37,23,750
Profit		5,25,000	6,08,750	7,76,250

Statement of Contribution Margin on Accepting the Special Order of 2,500 Medals

	(Rs.)
Sales Revenue (2,500 Medals × Rs.100 per medal)	2,50,000
Less: Variable Costs	
Direct Material (2,500 Medals × Rs.35 per medal)	87,500
Direct Manufacturing Labour (2,500 Medals × Rs.40 per medal)	1,00,000
Set-ups; Materials Handling ; Quality Control (25 Batches × Rs.500 per batch)	12,500
Contribution Margin	50,000

Decision: The above computations show that Souvenir Ltd. should accept the special order since its acceptance would increase the operating profit of the concern by Rs.50,000.

Acceptance of Special Order by Souvenir Ltd. when the Plant Capacity was 9,000 Medals

	(Rs.)
Gain in Contribution Margin because of Special Order	50,000
Less: Loss of Contribution Margin on Reduction of 1,000 Medals Sales in the Internal Market (W.N.-1 & 2)	(65,000)
Loss of Contribution Margin	(15,000)

Decision

The above computations show that the special order of 2,500 medals (when the plant capacity was reduced to 9,000 medals) should not be accepted since this decision will result in a loss of contribution margin by Rs. 15,000.

W.N.-1 Statement of Present Contribution on 7,500 Medals

	(Rs.)
Sales Revenue (7,500 Medals × Rs.150 per medal)	11,25,000
Less: Variable Costs	
Direct Material (7,500 Medals × Rs.35 per medal)	2,62,500
Direct Manufacturing Labour (7,500 Medals × Rs.40 per medal)	3,00,000
Set-up; Materials Handling ; Quality Control (150 Batches × Rs.500 per batch)	75,000
Contribution Margin	4,87,500

W.N.-2 Statement of Contribution Margin on 6,500 Medals

	(Rs.)
Sales Revenue (6,500 Medals × Rs.150 per medal)	9,75,000
Less: Variable Costs	
Direct Material (6,500 Medals × Rs.35 per medal)	2,27,500
Direct Manufacturing Labour (6,500 Medals × Rs.40 per medal)	2,60,000
Set-up; Materials Handling; Quality Control (130 Batches × Rs.500 per batch)	65,000
Contribution Margin	4,22,500

Material A

The requirement of 2,000 units of Material A has to be purchased in entirety since there are no units in stock. Therefore, the relevant cost will be the replacement cost at Rs. 8 per unit, which for 2,000 units is Rs. 16,000 (2,000 units × Rs. 8 per unit).

Material B

There is a requirement of 3,000 units of Material B, of which 1,200 units are in stock. Material B used regularly in the production of all types of dyes. If the 1,200 units in stock are used, they need to be replenished (replaced) in order to meet production demands of other dyes. In addition, for the special order, additional 1,800 units of Material B is required to be procured from the market. Therefore, 3,000 units of Material B has to be procured if the special order is undertaken. The relevant cost will be the replacement cost at Rs. 10 per unit, which for 3,000 units is Rs. 30,000 (3,000 units × Rs. 10 per unit).

Material C

There is a requirement of 2,000 units of Material C, of which 1,4 00 units are in stock. The balance 600 units have to be procured at the replacement (market) price of Rs. 14 per unit, which would be Rs. 8,400. Material C has no other use, so if the special order is not undertaken the stock of 1,400 units can be sold at Rs. 9 per unit. So, the opportunity cost of undertaking this order is Rs. 12,600. Therefore, the relevant cost for Material C is procurement cost of 600 units plus the opportunity cost of not disposing the current stock of 1,400 units, which would be

Rs. 8,400 + Rs. 12,600 = Rs. 21,000.

Material D

The entire requirement of 500 units of Material D is in stock. If the special order is not accepted, Color paints has two options (i) sell the excess material at Rs. 12 per unit or (ii) use it as a substitute for Material Z, which would otherwise need to be procured.

(i) The realizable value of Material D is Rs. 6,000 (500 units × Rs. 12 per unit).

(ii) Material D can be used as a substitute for 700 units of Material Z. Since, there is no stock of Material Z currently, if the special order is accepted, the entire quantity would have to be procured at Rs. 11 per unit. This would cost the company Rs. 7,700 (700 units × Rs. 11 per unit).

Both options (i) and (ii) represent opportunity cost if the special order is accepted. The relevant cost for Material D, if the special order is accepted would be higher of either of these two opportunity costs. The higher opportunity cost of that of procuring Material Z from the market at Rs. 7,700. Therefore, the relevant cost for Material D is Rs. 7,700.

Therefore, the relevant cost to accepting the special order would be the cumulative of the relevant cost for Materials A, B, C, and D. This works out to Rs. 74,700.