

**25<sup>TH</sup> COMPREHENSIVE EXAMINATION – MAY 2013****Marks****CASE # 1****(a) Net Present Value (NPV):**

	Year					
	1	2	3	4	5	
Unit price (Rs.)	240	240	240	220	220	
Unit sales	6,000	10,000	12,000	13,000	12,000	
	Rs. in '000 <sup>e</sup>					
Revenues	1,440	2,400	2,880	2,860	2,640	1
Variable costs	720	1,200	1,440	1,560	1,440	1
Cash fixed costs	50	50	50	50	50	1
Depreciation	250	250	250	250	250	1
Total cost	1,020	1,500	1,740	1,860	1,740	1
EBIT	420	900	1,140	1,000	900	1
Taxes (35%)	147	315	399	350	315	1
Net income	273	585	741	650	585	1
Add Depreciation	250	250	250	250	250	1
Operating cash flow	523	835	991	900	835	1
<b>OR</b>	2	+	2	+	2	= 10

**Workings:**

Depreciation Expenses:

$$(\text{Rs. } 1,600,000 - 350,000) \div 5 \text{ years} = \text{Rs. } 250,000 \quad 1$$

Schedule of Working Capital:

Year	Rs. in '000 <sup>e</sup>			
	Revenues	Net Working Capital (NWC)	Cash Flow	
0			(40)	
1	1,440	216	(176)	1
2	2,400	360	(144)	1
3	2,880	432	(72)	1
4	2,860	429	3	1
5	2,640	396	33	1

Net Present Value (NPV):

Present Value (NPV):

Rs. in '000<sup>b</sup>

	Year						
	0	1	2	3	4	5	
Operating cash flow		523	835	991	900	835	
Change in NWC	(40)	(176)	(144)	(72)	3	33	
Recovery of NWC						396	1
Special Equipment	(1,600)						½
Salvage Value						350	½
Total project cash flow	(1,640)	347	691	919	903	1,614	1
PV factor @ 15%	1.00	0.870	0.756	0.658	0.572	0.497	
Discounted cash flow	(1,640)	301.89	522.40	604.70	516.52	802.16	1
NPV (2,747.66 – 1,640)	1,107.66						1

Decision:

The company should launch the shampoo because the net present value is Rs.1,107.66.

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**25<sup>TH</sup> COMPREHENSIVE EXAMINATION – MAY 2013****Marks****(b)** Discounted Payback Period:

Year	Discounted Cash Flow	Accumulated Cash Flow
1	301,890	301,890
2	522,396	824,286
3	604,702	1,428,988
4	516,516	1,945,504
5	802,158	2,747,662

Discounted payback period =  $3 + 211,012 \div 516,516 = 3 + 0.41 = \mathbf{3.41 \text{ years}}$

**(c)** Profitability Index (PI):

$$\begin{aligned}
 \text{PI} &= \frac{\text{PV of future cash flow}}{\text{Initial cost}} \\
 &= \frac{2,747,662}{1,640,000} = \mathbf{1.68}
 \end{aligned}$$



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**25<sup>TH</sup> COMPREHENSIVE EXAMINATION – MAY 2013****Marks****CASE # 2****(a)** Machine Hours Required:

Product	Department			
	I	II	III	IV
A	500	500	1,000	1,000
B	400	400	—	800
C	2,000	2,000	1,000	1,000
Total required	2,900	2,900	2,000	2,800
Total available	3,000	3,100	2,700	3,300
Excess/ (Deficiency)	100	200	700	500

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Direct Labour Hours Required:

Product	Department			
	I	II	III	IV
A	1,000	1,500	1,500	500
B	400	800	—	800
C	2,000	2,000	2,000	1,000
Total required	3,400	4,300	3,500	2,300
Total available	3,700	4,500	2,750	2,600
Excess/ (Deficiency)	300	200	(750)	300

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**(b)** It is apparent that the monthly sales demand cannot be met for all three (3) products as a result of the labour shortage in Department-III. Therefore, products produced in the sequence of having more contribution margin.

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**Workings:**

W-1: Contribution Margin of each Product:

	Rupees/ Unit		
	Product		
	A	B	C
Sales price	19,600	12,300	16,700
Variable costs:			
Direct material	700	1,300	1,700
Direct labour	6,600	3,800	5,100
Variable overhead	2,700	2,000	2,500
Variable selling expenses	300	200	400
Total variable costs	10,300	7,300	9,700
Contribution margin	9,300	5,000	7,000

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Fixed costs are not relevant.

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**25<sup>TH</sup> COMPREHENSIVE EXAMINATION – MAY 2013****Marks**

W-2: Contribution Margin per direct labour hours (DLH) in Department-III for Products <sup>3</sup>A<sup>1</sup> and <sup>1</sup>C<sup>1</sup>:

Product	Contribution Margin (Rs.)	Department- III DLH	Contribution Margin per DLH (Rs.)
A	9,300	3	3,100
C	7,000	2	3,500

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W-3: The scarce resource is direct labour hours (DLH) in Department- III. Orbit Industries should first produce the product that maximizes contribution margin per unit of the direct labour hours.

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	Units	Department- III DLH Required	Balance (DLH)
Maximum DLH available in Department-III			2,750
Product <sup>3</sup> C <sup>1</sup> first	1,000	2,000	750
Product <sup>1</sup> A <sup>1</sup> second	250	750	—

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Production schedule considering the contribution margin per direct labour hours in Department-III as calculated above:

Product	Units	Comments
A	250	Produce as much as the constraint allows (750) ÷ 3 DLH per unit. Reduced production is based on its lower contribution margin per direct labour hour.
B	400	Produce upto monthly sales demand; unaffected by Department-III.
C	1,000	Produce as much as possible to maximize contribution margin per DLH.

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(c) Product-Wise Contribution Margin.

Product	Contribution Margin per Unit (Rs.)	Units Produced	Contribution to Profit (Rs.)
A	9,300	250	2,325,000
B	5,000	400	2,000,000
C	7,000	1,000	7,000,000
Total contribution margin			<b>11,325,000</b>

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(d) To supply additional quantities of product <sup>1</sup>A<sup>1</sup> that are required, Orbit Industries should consider the following:

- ☐ Subcontracting the additional units.
- ☐ Operating on an overtime basis.
- ☐ Acquiring labour from outside the area.

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**THE END**