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**SUGGESTED SOLUTION**

**CA INTERMEDIATE NOV'19**

**SUBJECT- F.M.**

**Test Code – CIM 8319**

**BRANCH - () (Date :)**

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## ANSWER-1

(i) Calculation of Cost of Capital for each source of capital:

(a) Cost of Equity share capital:

$$K_e = \frac{D_0(1+g)}{\text{Market Price per share } (P_0)} + g = \frac{25\% \times \text{Rs.}100(1+0.05)}{\text{Rs.}200} + 0.05$$
$$= \frac{\text{Rs.}26.25}{\text{Rs.}200} + 0.05 = 0.18125 \text{ or } 18.125\%$$

(b) Cost of Preference share capital ( $K_p$ ) = 9%

$$\begin{aligned} \text{(c) Cost of Debentures } (K_d) &= r(1-t) \\ &= 11\%(1-0.3) = 7.7\%. \end{aligned}$$

(d) Cost of Retained Earnings:  $K_s = K_e(1-t_p) = 18.125(1-0.2) = 14.5\%$ .

(4 MARKS)

(ii) Weighted Average Cost of Capital on the basis of book value weights

Source	Amount (Rs.)	Weights (a)	After tax Cost of Capital (%) (b)	WACC (%) (c) = (a) x (b)
Equity share	80,00,000	0.40	18.125	7.25
9% Preference share	20,00,000	0.10	9.000	0.90
11% Debentures	60,00,000	0.30	7.700	2.31
Retained earnings	40,00,000	0.20	14.500	2.90
	<b>2,00,00,000</b>	<b>1.00</b>		<b>13.36</b>

(3 MARKS)

(iii) Weighted Average Cost of Capital on the basis of market value weights

Source	Amount (Rs.)	Weights (a)	After tax Cost of Capital (%) (b)	WACC (%) (c) = (a) x (b)
Equity share	1,06,66,667	0.427	18.125	7.739
Retained Earnings	53,33,333	0.213	14.500	3.09
9% Preference share	24,00,000	0.096	9.000	0.864
11% Debentures	66,00,000	0.264	7.700	2.033
	<b>2,50,00,000</b>	<b>1.000</b>		<b>13.726</b>

(3 MARKS)

## ANSWER-2

### Working Notes:

$$\text{Depreciation on Machine X} = \frac{1,50,000}{5} = \text{Rs.}30,000$$

$$\text{Depreciation on Machine Y} = \frac{2,40,000}{6} = \text{Rs.}40,000$$

Particulars	Machine X (Rs.)	Machine Y (Rs.)
<b>Annual Savings:</b>		
Wages	90,000	1,20,000
Scrap	10,000	15,000
<b>Total Savings (A)</b>	<b>1,00,000</b>	<b>1,35,000</b>
<b>Annual Estimated Cash Cost :</b>		
Indirect Material	6,000	8,000
Supervision	12,000	16,000
Maintenance	7,000	11,000
<b>Total Cash Cost (B)</b>	<b>25,000</b>	<b>35,000</b>
Annual Cash Savings (A-B)	75,000	1,00,000
Less : Depreciation	30,000	40,000
Annual Savings Before Tax	45,000	60,000
Less : Tax @ 30%	13,500	18,000
Annual Savings/Profit (After Tax)	31,500	42,000
Add : Depreciation	30,000	40,000
<b>Annual Cash Inflows</b>	<b>61,500</b>	<b>82,000</b>

(6 MARKS)

### Evaluation of Alternatives:

(2\*2 = 4 MARKS)

#### (i) Average Rate of Return Method (ARR)

$$\text{ARR} = \frac{\text{Average Annual Net Savings}}{\text{Average Investment}}$$

$$\text{Machine X} = \frac{31,500}{75,000} \times 100 = 42\%$$

$$\text{Machine Y} = \frac{42,000}{1,20,000} \times 100 = 35\%$$

**Decision :** Machine X is better

**[Note:** ARR can be computed alternatively taking initial investment as the basis for computation (ARR = Average Annual Net Income/Initial Investment). The value of ARR for Machines X and Y would then change accordingly as 21% and 17.5% respectively]

**(ii) Present Value Index Method**

Present Value of Cash Inflow = Annual Cash Inflow x P.V. Factor @ 10%

$$\begin{aligned} \text{Machine X} &= 61,500 \times 3.79 \\ &= \text{Rs. } 2,33,085 \end{aligned}$$

$$\begin{aligned} \text{Machine Y} &= 82,000 \times 4.354 \\ &= \text{Rs. } 3,57,028 \end{aligned}$$

$$\text{P.V. Index} = \frac{\text{Present Value}}{\text{Investment}}$$

$$\text{Machine X} = \frac{2,33,085}{1,50,000} = 1.5539$$

$$\text{Machine Y} = \frac{3,57,028}{2,40,000} = 1.4876$$

**Decision :** Machine X is better

**ANSWER-3**

**Note:** Discount Factor for Lessee based on After Tax Cost of Debt, i.e.  $16\% \times 50\% = 8\%$ .

**1. Computation of Cash Flows under Lease Option**

Year	Lease Rental	10% Gross Revenue	Lump sum Payment	Total Cash flows	After Tax Cash flows	Disc factor @ 8%	Discounted Cash Flow
[1]	[2]	[3]	[4]	[5]	[6]= [5]x0.50	[7]	[8]
1	5,00,000	2,25,000	-	7,25,000	3,62,500	0.926	3,35,675
2	5,00,000	2,50,000	-	7,50,000	3,75,000	0.857	3,21,375
3	5,00,000	2,75,000	6,00,000	13,75,000	6,87,500	0.794	5,45,875
							12,02,925

**Note:** Operating and Training Costs are common in both alternatives, hence not considered in evaluation.

**(4 MARKS)**

**2. Computation of Cash Flows under Loan (Borrow & Buy) Option**

**Note:**

(a) Annual Depreciation p.a, =

$$\frac{\text{Cost of Asset - Salvage Value}}{\text{Useful life}} = \frac{(22,00,000 - 10,00,000)}{3} = \text{Rs. } 4,00,000$$

(b) Tax Savings on Depreciation = Depreciation x Tax Rate = Rs. 4,00,000 x 50% = Rs.2,00,000

(2 MARKS)

**(b) Present Value of Cash Outflows**

End of Year	Interest Paid	Principal Repaid	After Tax Interest Payment	Tax Savings on Depreciation	Total Cash Flow for the year	PVat8%	Discounted Cash Flow
(1)	(2)	(3)	(4) = (2) x 0.50	(5)	(6) = (3) + (4) – (5)	(7)	(8)=(6)x (7)
1	3,52,000	5,00,000	1,76,000	2,00,000	4,76,000	0.926	4,40,776
2	2,72,000	8,50,000	1,36,000	2,00,000	7,86,000	0.857	6,73,602
3	1,36,000	8,50,000	68,000	2,00,000	7,18,000	0.794	5,70,092
							16,84,470
Less: Salvage Value at the end of Year 3 10,00,000 x 0.794							7,94,000
Net Present Value							8,90,470

**Conclusion:** Borrow & Buy Option is preferable, since PV of Outflows is lower.

(4 MARKS)

**ANSWER-4**

i) The net present values of the Projects A and B at cost of capital are as below:

Years	Project-A (Rs Lakh]	PVF at 17%	Present value of cash inflow	Project-B (Rs lakh]	PVF at 17%	Present value of cash inflow
0	-250	1	-250	-250	1	-250
1	60	0.8547	51.3	100	0.8547	85.47
2	70	0.7305	51.1	120	0.7305	87.66
3	80	0.6244	49.9	100	0.6244	62.44
4	120	0.5337	64.0	20	0.5337	10.67
5	120	0.4561	54.7	40	0.4561	18.24
NPV			21.14			14.48

Based on NPV rule the firm must undertake Project A having higher NPV.

(5 MARKS)

ii) Using certainty equivalent (CE) approach we may find the equivalent cash flows that are certain by using the certainty equivalent factor for each year, and then discounting these certain cash flows at risk free rate.

Years	Project- A (Rs Lakh]	CE factor	Adjusted Cash flow	PVF at 6%	Present value of cash inflow	Project- B (Rs lakh]	Adjusted Cash flow	Present value of cash inflow
0	-250	1	-250	1	-250	-250	-250	-250
1	60	0.9	54	0.9434	50.9	100	90	84.9
2	70	0.8	56	0.8900	49.8	120	96	85.4
3	80	0.7	56	0.8396	47.0	100	70	58.8
4	120	0.6	72	0.7921	57.0	20	12	9.5
5	120	0.5	60	0.7473	44.8	40	20	14.9
NPV					0.3			3.6

Based on the certain cash flows as modified by the certainty equivalent factor Project B is preferable since it has positive NPV while Project A has negative NPV.

(5 MARKS)

#### ANSWER-5

#### Initial Cash Outlay

	Rupees	
Cost of New Machine		10,00,000
Less: Sale of old machine	3,50,000	
Less: Tax on profit on sale of machine 30% of Rs. 50,000	15,000	(3,35,000)
Add: Increase in Working Capital (2,00,000 - 50,000)		1,50,000
Initial Cash Outlay		8,15,000
Additional Depreciation		
New Machine (10,00,000 - 1,00,000) / 5 years	1,80,000	
Old machine Annual Depreciation	28,000	
Increase in Depreciation		1,52,000
Annual Cash Inflow		
Increase in sales		1,00,000
Reduction in operating expenses		2,00,000
		3,00,000
Less increase in depreciation		(1,52,000)
Increase in Profit before Tax		1,48,000
Lease Tax @ 30%		(44,400)
Net Savings after tax		1,03,600
Add: Depreciation		1,52,000

Net Cash Inflow p.a.		2,55,600
Terminal Inflow		
Salvage	1,00,000	
Release of Working Capital	1,50,000	2,50,000

(7 MARKS)

### Net Present Value

Year	Net Cash Inflow (Rs.)	PVIF	PV
0	-8,15,000	1,000	-8,15,000
1-5	2,55,600	3,6048 (12%, 5)	9,21,387
5	2,50,000	0.5674	1,41,850
NPV			2,48,237

Since NPV of the proposal is positive, it is advisable to replace the old machine with new machine.

**Note :** Interest cost on additional investment, etc. has been ignored because it is a financial cost.

(3 MARKS)