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SUGGESTED SOLUTION

CA INTERMEDIATE

SUBJECT- COSTING AND F.M.

Test Code – CIM 8521

BRANCH - () (Date :)

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ANSWER -1

ANSWER –A

Statement of Cost for the month of September

Particulars	Rs.	Rs.
Raw material Consumed:		
Opening stock of Raw material	2,42,000	
Add : Purchases of raw material (Balancing Figure)	52,37,930	
Less : Closing stock of raw material	(2,92,000)	
Raw material consumed(Working Note 1)		51,87,930
Add : Direct Employee cost (50% of 51,87,930)		25,93,965
Prime cost		77,81,895
Add: Factory overheads :		
Consumable stores	3,50,000	
Lease rent of Production Assets	2,00,000	5,50,000
Gross work cost		83,31,895
Add : Opening stock of WIP		2,00,000
Less : Closing stock of WIP		(5,00,000)
Net Work cost /Factory cost		80,31,895
Add : Research and development cost for Process		2,50,000
Add : Quality Control cost		2,00,000
Less : Scrap value realised (Working Note 2)		(2,44,000)
Cost of production		82,37,895
Add : Opening stock of finished goods		Nil
Less : Closing stock of finished goods		(4,11,895)
Cost of Goods sold (Given)		78,26,000
Add : Selling and Distribution expenses		4,13,000
Add : Packing cost (Secondary)		1,90,000
Add : Administrative Expenses (General)		2,24,000
Cost of Sales (A)		86,53,000
Add : Profit (B-A)		17,97,000
Sales (Working Note 3)(B)		1,04,50,000

Working Note 1: Raw material Consumed

Let 'x' be the amount of Raw material consumed.

Therefore, Direct Employee cost will be 0.5x

Therefore, Prime cost = 1.5x

On Solving Equation:

Prime Cost + [Factory O/H + Opening WIP – Closing WIP+ Research & Development cost..+ Quality Control Cost – Scrap]+Opening stock of Finished goods – Closing Stock of Finished goods = 78,26,000

$$1.5x + [4,56,000] - \left(\frac{5000 \text{ units}(1.5x + 4,56,000)}{1,00,000 \text{ units}} \right) = 78,26,000$$

$$1.5x + [4,56,000] - 0.075x - 22800 = 78,26,000$$

We get 'x' =51,87,930 (i.e. R/M Consumed)

Working Note 2: Scrap Value realized:

$$1,00,000 \times 4\% \times 61 = \text{Rs. } 2,44,000$$

Working Note 3: Sales:

Sales Qty= Opening Stock of Finished goods + Production Qty – Closing Stock of Finished goods

$$\text{Sales Qty} = \text{Nil} + 1,00,000 - 5,000$$

$$\text{Sales Qty} = 95,000 \text{ units}$$

Therefore sales value will be $95,000 \times 110 = 1,04,50,000$ Rs.

- (i) Value of Raw Material Purchased = Raw Material Consumed + Closing Stock of Raw Material – Opening Stock of Raw material

$$\text{Raw Material Purchased} = 51,87,930 + 2,92,000 - 2,42,000$$

$$= \text{Rs. } 52,37,930$$

- (ii) Profit = Sale – Cost of Sales

$$= 1,04,50,000 - 86,53,000$$

$$= \text{Rs. } 17,97,000$$

(10 MARKS)

ANSWER -B

Calculation of Net Cash flows

$$\text{Contribution} = (3.00 - 1.75) \times 50,000 = \text{Rs. } 62,500$$

$$\text{Fixed costs} = 40,000 - [(1,25,000 - 30,000)/5] = \text{Rs. } 21,000$$

Year	Capital (Rs.)	Contribution (Rs.)	Fixed costs (Rs.)	Adverts (Rs.)	Net cash flow (Rs.)
0	(1,00,000)				(1,00,000)
1	(25,000)	62,500	(21,000)	(10,000)	6,500
2		62,500	(21,000)	(15,000)	26,500
3		62,500	(21,000)		41,500
4		62,500	(21,000)		41,500
5	30,000	62,500	(21,000)		71,500

Calculation of Net Present Value

Year	Net cash flow (Rs.)	10% discount factor	Present value (Rs.)
0	(1,00,000)	1.000	(1,00,000)
1	6,500	0.909	5,909
2	26,500	0.826	21,889
3	41,500	0.751	31,167
4	41,500	0.683	28,345

5	71,500	0.621	44,402
			31,712

The net present value of the project is Rs. 31,712.

(4 MARKS)

ANSWER -2

ANSWER –A

(i) **Payback Period of Projects**

	C₀	C₁		C₂		C₃	
A	- 10,000 +	6,000	+	2,000	+	2,000	= 3 years
B	- 10,000 +	2,500	+	2,500	+	5,000	= 3 years
C	- 3,500+	1,500	+	2,500			= 1 year and 9.6 months
	i.e. $\frac{12}{2,500} \times 2,000$						
D	-3,000 +	0	+	0	+		= 3 years

(2 MARKS)

(ii) If standard payback period is 2 years, Project C is the only acceptable project. But if standard payback period is 3 years, all the four projects are acceptable.

(1 MARK)

(iii) **Discounted Payback Period** (Cash flows discounted at 10%)

A - 10,000 + 5,454.6 + 1,652.8 + 1,502.6 + 8,196

3 years + $\frac{12}{8,196} \times 1,390 = 3$ years and 2 months

B - 10,000 + 2,272.75 + 2,066 + 3,756.5 + 5,122.50

3 years + $\frac{12}{5,122.55} \times 1,904.75 = 3$ years and 4.6 months

C - 3,500 + 1,363.65 + 2,066 + 375.65 + 3,415

2 years + $\frac{12}{375.65} \times 70.35 = 2$ years and 2.25 months

D - 3,000 + 0 + 0 + 2,253.9 + 4,098

3 years + $\frac{12}{4,098} \times 746.10 = 3$ years and 2.18 months

If standard discounted payback period is 2 years, no project is acceptable on discounted payback period criterion.

If standard discounted payback period is 3 years, Project 'C' is acceptable on discounted payback period criterion.

(iv) Evaluation of Projects on NPV criterion

$$A = -10,000 + 5,454.6 + 1,652.8 + 1,502.60 + 8,196$$

$$NPV = \text{Rs. } 6,806.2$$

$$B = -10,000 + 2,272.75 + 2,066 + 3,756.5 + 5,122.5$$

$$NPV = \text{Rs. } 3,217.75$$

$$C = -3,500 + 1,363.65 + 2,066 + 3,75.65 + 3,415$$

$$NPV = \text{Rs. } 3,720.3$$

$$D = -3,000 + 0 + 0 + 2,253.9 + 4,098$$

$$NPV = \text{Rs. } 3,351.9$$

Ranking of Projects on NPV Criterion

	NPV Rs.	Rank
A	6,806.2	I
B	3,217.75	IV
C	3,720.3	II
D	3,351.9	III

Analysis: Project A is acceptable under the NPV method. The NPV technique is superior to any other technique of capital budgeting, whether it is PI or IRR. The best project is the one which adds the most, among available alternatives, to the shareholders wealth. The NPV method, by its very definition, will always select such projects. Therefore, the NPV method gives a better mutually exclusive choice than PI method. The NPV method guarantees the choice of the best alternative.

(2.5 MARKS)

ANSWER -B**1. Computation of Growth Rate of Dividends**

Let Growth Rate = $r\%$. So, Dividends have increased from Rs. 10.60 to Rs. 14.19, over a 5 year period. This means that the Compounding Factor Tables should be used to compute Growth Rate " r ".

Growth Rate g is computed by the equation: $\text{Rs. } 10.6 \times (1+r)^5 = \text{Rs. } 14.19$

$$(1+r)^5 = 1.338$$

From the Compounding Factor Table Rs. 1 compounds to Rs. 1.338 in 5 years at a Compound Rate of 6%. Hence, $g = 6\%$.

(2 MARKS)

2. Computation of Individual Cost of Capital

$$K_e = \frac{DPS_1}{MPS_0} + g = \frac{15}{120} + 0.06 = 18.5\% \text{ [Note: } MPS_0 \text{ is taken as New Issue Price 125 less}$$

Floation Cost 5]

$$K_r = \frac{DPS_1}{MPS_0} + g = \frac{15}{125} + 0.06 = 18\% \text{ [Note: } MPS_0 \text{ is taken as Current Price 130 less}$$

Floation Cost 5]

$$K_p = \frac{\text{Preference Dividend}}{\text{Net Proceeds}} = \frac{15}{105} = 14.3\%$$

$$K_d = \frac{\text{Interest} \times (100\% - \text{Tax Rate}) + \frac{RV = NP}{N}}{\frac{RV + NP}{2}} =$$

$$= \frac{15 \times (100\% - 35\%) + \frac{100 - 91.75}{11}}{\frac{100 + 91.75}{2}} = 11\% \text{ (See Note for Net Proceeds)}$$

Note: Since Yield on similar type of Debentures is 16%, the Company will be required to offer Debentures at discount.

$$\text{Market Price of Debentures} = \frac{\text{Coupon Rate}}{\text{Market Rate of Interest}} = \frac{15}{16} = \text{Rs. } 93.75.$$

Net Proceeds from Debentures = Issue Price Rs. 93.75 - Floation Cost Rs. 2 =Rs. 91.75

(3 MARKS)

2. Computation of WACC based on Book Value Proportions

Component	Amount (in Rs. Lakhs)	Proportion	Individual Cost	WACC
Equity	120	62%	18.5%	11.47%
Retained Earnings	30	15%	18%	2.7%
Preference Shares	9	5%	14.3%	0.715%
Debentures	36	18%	11%	1.98%
Total	195	100%		16.865%

(1.5 MARKS)

3. Computation of WACC based on Market Value Proportions

Component	Amount (in Rs. Lakhs)	Proportion	Individual Cost	WACC
Equity	(Note)160	66%	18.5%	12.21%
Retained Earnings	(Note) 40	16%	18%	2.88%
Preference Shares	10.4	4%	14.3%	0.572%
Debentures	33.75	14%	11%	1.54%
Total	244.15	100%		17.202%

Note: MV of Equity has been apportioned in the ratio of BV of Equity and Retained Earnings. Alternatively, under Market Value Approach, Cost of Equity and Cost of Retained Earnings may be taken at the same rate, say 18.5%, and combined as one single component of Capital.

(1.5 MARKS)

ANSWER -3

(i) Calculation of after tax cost of the followings:

$$(a) \text{ New 14\% Debentures } (K_d) = \frac{1(1-t)}{NP} = \frac{Rs.14(1-0.5)}{Rs.98} = 0.0714 \text{ or } 7.14\%$$

$$\text{New 12\% Preference Shares } (K_p) = \frac{PD}{NP} = \frac{Rs.1.20}{Rs.9.80} = 0.1224 \text{ or } 12.24\%$$

(b) Equity Shares (Retained Earnings) (K_e) =

$$= \frac{\text{Expected Dividend } (D_1)}{\text{Current market price } (P_0)} + \text{Growth rate } (g)$$

$$= \frac{50\% \text{ of Rs.}2.773}{Rs.27.75} + 0.12 = 0.17 \text{ or } 17\%$$

* Growth rate (on the basis of EPS) is calculated as below :

$$\frac{\text{EPS in current year} - \text{EPS in previous year}}{\text{EPS in previous year}} = \frac{Rs.2.773 - Rs.2.476}{Rs.2.476} = 0.12$$

(Students may verify the growth trend by applying the above formula to last three or four years)

(3 MARKS)

(ii) Calculation of marginal cost of capital (on the basis of existing capital structure):

Source of capital	Weight (a)	After tax Cost of capital (%) (b)	WACC (%) (a) × (b)
14% Debenture	0.15	7.14	1.071
12% Preference shares	0.05	12.24	0.612
Equity shares	0.80	17.00	13.600
Marginal cost of capital			15.283

(2 MARKS)

(iii) The company can spent for capital investment before issuing new equity shares and without increasing its marginal cost of capital:

Retained earnings can be available for capital investment

$$= 50\% \text{ of } 2015 \text{ EPS} \times \text{equity shares outstanding}$$

$$= 50\% \text{ of Rs. } 2.773 \times 2,00,000 \text{ shares} = \text{Rs.}2,77,300$$

Since, marginal cost of capital is to be maintained at the current level i.e. 15.28%, the retained earnings should be equal to 80% of total additional capital for investment.

$$\text{Thus investment before issuing equity} \left(\frac{Rs.2,77,300}{80} \times 100 \right) = \text{Rs.}3,46,625$$

The remaining capital of Rs. 69,325 i.e. Rs. 3,46,625 – Rs. 2,77,300 shall be financed by issuing 14% Debenture and 12% preference shares in the ratio of 3 : 1 respectively.

(2 MARKS)

- (iv) If the company spends more than Rs. 3,46,625 as calculated in part (iii) above, it will have to issue new shares at Rs. 20 per share.

The cost of new issue of equity shares will be:

$$K_e = \frac{\text{Expected Dividend (D}_1\text{)}}{\text{Current market price (P}_0\text{)}} + \text{Growth rate (g)} =$$
$$= \frac{50\% \text{ of Rs.2.773}}{\text{Rs.20}} + 0.12 = 0.1893 \text{ or } 18.93\%$$

Calculation of marginal cost of capital (assuming the existing capital structure will be maintained):

Source of capital	Weight (a)	Cost (%) (b)	WACC (%) (a) × (b)
14% Debenture	0.15	7.14	1.071
12% Preference shares	0.05	12.24	0.612
Equity shares	0.80	18.93	15.144
Marginal cost of capital			16.827

(3 MARKS)

ANSWER -4

Recommendations regarding Two Alternative Proposals

(i) Net Present Value Method

Computation of Present Value

$$\text{Project A} = \text{Rs. } 4,00,000 \times 3.791 = \text{Rs. } 15,16,400$$

$$\text{Project B} = \text{Rs. } 5,80,000 \times 3.791 = \text{Rs. } 21,98,780$$

Computation of Net Present Value

$$\text{Project A} = \text{Rs. } 15,16,400 - 12,00,000 = \text{Rs. } 3,16,400$$

$$\text{Project B} = \text{Rs. } 21,98,780 - 18,00,000 = \text{Rs. } 3,98,780$$

Advise: Since the net present value of Project B is higher than that of Project A, therefore, Project B should be selected.

(3 MARKS)

(ii) Present Value Index Method

$$\text{Present Value Index} = \frac{\text{Present Value of Cash Inflow}}{\text{Initial Investment}}$$

$$\text{Project A} = \frac{15,16,400}{12,00,000} = 1.264$$

$$\text{Project B} = \frac{21,98,780}{18,00,000} = 1.222$$

Advise: Since the present value index of Project A is higher than that of Project B, therefore, Project A should be selected.

(3 MARKS)

(iii) Internal Rate of Return (IRR)

Project A

$$\text{P.V. Factor} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}} = \frac{12,00,000}{4,00,000} = 3$$

PV factor falls between 18% and 20%

Present Value of cash inflow at 18% and 20% will be:

$$\text{Present Value at 18\%} = 3.127 \times 4,00,000 = 12,50,800$$

$$\text{Present Value at 20\%} = 2.991 \times 4,00,000 = 11,96,400$$

$$\text{IRR} = 18 + \frac{12,50,800 - 12,00,000}{12,50,800 - 11,96,400} \times (20 - 18)$$

$$= 18 + \frac{50,800}{54,400} \times 2$$

$$= 18 + 1.8676 = 19.868 \%$$

Project B

$$\text{P.V. Factor} = \frac{18,00,000}{5,80,000} = 3.103$$

Present Value of cash inflow at 18% and 20% will be:

$$\text{Present Value at 18\%} = 3.127 \times 5,80,000 = 18,13,660$$

$$\text{Present Value at 20\%} = 2.991 \times 5,80,000 = 17,34,780$$

$$\text{IRR} = 18 + \frac{18,13,660 - 18,00,000}{18,13,660 - 17,34,780} \times (20 - 18)$$

$$= 18 + \frac{13,660}{78,880} \times 2$$

$$= 18 + 0.3463 = 18.346 \%$$

Advise: Since the internal rate of return of Project A is higher than that of Project B, therefore, Project A should be selected.

(4 MARKS)