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SUGGESTED SOLUTION

CA INTERMEDIATE

SUBJECT- F.M.

Test Code – CIM 8530

BRANCH - () (Date :)

Head Office : Shraddha, 3rd Floor, Near Chinai College, Andheri (E), Mumbai – 69.
Tel : (022) 26836666

ANSWER - 1

Net Present Value of Projects

Year	Cash Inflows Project A (Rs.)	Cash Inflows Project B (Rs.)	Present Value Factor @ 12%	PV of Project A (Rs.)	PV of Project B (Rs.)
0	(5,00,000)	(5,00,000)	1.000	(5,00,000)	(5,00,000)
1	7,50,000	2,00,000	0.893	6,69,750	1,78,600
2	0	2,00,000	0.797	0	1,59,400
3	0	7,00,000	0.712	0	4,98,400
				1,69,750	3,36,400

Internal Rate of Returns of projects

Let us discount cash flows using 50% discounting rate.

Year	Cash Inflows Project A (Rs.)	Cash Inflows Project B (Rs.Rs.)	Present Value Factor @ 50%	PV of Project A (Rs.)	PV of Project B (Rs.)
0	(5,00,000)	(5,00,000)	1.000	(5,00,000)	(5,00,000)
1	7,50,000	2,00,000	0.667	5,00,250	1,33,400
2	0	2,00,000	0.444	0	88,800
3	0	7,00,000	0.296	0	2,07,200
				250	(70,600)

(6 MARKS)

Since, IRR of project A shall be 50% as NPV is very small. Further, by discounting cash flows at 50% we are getting NPV of Project B negative, let us discount cash flows of Project B using 15% discounting rate.

Year	Cash Inflows Project B (Rs.)	Present Value Factor @ 15%	PV of Project B (Rs.)
0	(5,00,000)	1.000	(5,00,000)
1	2,00,000	0.870	1,74,000
2	2,00,000	0.756	1,51,200
3	7,00,000	0.658	4,60,600
			2,85,800

The internal rate can be obtained by interpolation:

$$IRR_B = 15\% + \frac{2,85,800}{2,85,800 - (70,600)} \times (50\% - 15\%)$$

$$= 15\% + \left(\frac{2,85,800}{3,56,400} \times 35\%\right) = 43.07\%$$

(4 MARKS)

ANSWER – 2

ANSWER - A

(i) Walter's Formula : $P = \frac{D+\frac{r}{K_e}(E-D)}{K_e}$

$P = \frac{6+\frac{0.25}{0.20}(10-6)}{0.20}$

P = Rs. 55

(ii) **Gordon's formula (Dividend Growth model) :** When the growth is incorporated in earnings and dividend, the present value of market price per share (P_o) is determined as follows :

Gordon's theory :

$P_0 = \frac{E_1(1-b)}{K_e - br}$

Where,

P_0 = Price per share

E_1 = Earnings per share

b = Retention ratio; (1 – b = Payout ratio)

K_e = Cost of capital

r = IRR

br = Growth rate (g)

$P_o = \frac{10\ (1-0.40)}{0.20-(0.40 \times 0.25)}$ = Rs.$\frac{6}{0.10}$ = Rs. 60

OR

$P_o = \frac{6+10\%}{0.20-(0.40 \times 0.25)}$ = Rs.$\frac{6.6}{0.10}$ = Rs. 66

(5 MARKS)

ANSWER – B

	Rs. in lakhs
Net Profit	30
Less : Preference dividend	12
Earnings for equity shareholders	18
Therefore earning per share	18/3 = Rs. 6.00

Price per share according to Gordon's Model is calculated as follows :

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

Here, $E_1 = 6$, $K_e = 16\%$

(2 MARKS)

(i) When dividend pay – out is 25%

$$P_0 = \frac{6 \times 0.25}{0.16-(0.75\times0.2)} = \frac{15}{0.16-0.15} = 150$$

(ii) When dividend pay – out is 50%

$$P_0 = \frac{6 \times 0.5}{0.16-(0.5\times0.2)} = \frac{3}{0.16-0.10} = 50$$

(iii) When dividend pay – out is 100%

$$P_0 = \frac{6\times1}{0.16-(0 \times 0.02)} = \frac{6}{0.16} = 37.50$$

(3*1 = 3 MARKS)

ANSWER – 3

ANSWER - A

The Present Value of the Cash Flows for all the years by discounting the cash flow at 7% is calculated as below :

Year	Cash flows	Discounting Factor @ 7%	Present value of Cash flows
	Rs. In lakhs		**Rs. In Lakhs**
1	25	0.935	23.38
2	60	0.873	52.38
3	75	0.816	61.20
4	80	0.763	61.04
5	65	0.713	46.35
Total of present value of Cash flow			244.34
Less : Initial investment			(100.00)
Net Present Value (NPV)			144.34

Now when the risk – free rate is 7% and the risk premium expected by the Management is 7%. So the risk adjusted discount rate is 7% + 7% = 14%.

(3 MARKS)

Discounting the above cash flows using the Risk Adjusted Discount Rate would be as below :

Year	Cash flows	Discounting Factor @ 14%	Present Value of Cash Flows
	Rs. in Lakhs		**Rs. in lakhs**
1	25	0.877	21.93
2	60	0.769	46.14
3	75	0.675	50.63
4	80	0.592	47.36
5	65	0.519	33.74
Total of present value of Cash flow			199.79

Initial investment	(100.00)
Net Present value (NPV)	99.79

(3 MARKS)

ANSWER - B

Statement showing the determination of the risk adjusted net present value

Projects	Net Cash outlays	Coefficient of variation	Risk adjusted discount rate	Annual cash inflow	PV factor 1 – 5 years	Discounted cash inflow	Net present value
	(Rs.)			(Rs.)		(Rs.)	(Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii) = (v) × (vi)	(viii) = (vii) – (ii)
X	2,10,000	1.20	16%	70,000	3.274	2,29,180	19,180
Y	1,20,000	0.80	14%	42,000	3.433	1,44,186	24,186
Z	1,00,000	0.40	12%	30,000	3.605	1,08,150	8,150

(4 MARKS)

ANSWER – 4

1. **Computation of Price :** As per MM Divided Theory, $P_0 = \frac{P_1 + D_1}{1 + K_e}$. Hence, $P_1 = P_0 (1 + K_e) – D_1$, computed as under :

If Dividend Not Declared	If Dividend Declared
$P_0 (1+K_e) – D_1$ = 100 x (1 + 12%) – 0 = 112 – 0 = Rs. 112	$P_0 (1+K_e) – D_1$ = 100 x (1 + 12%) – 10 = 112 – 10 = Rs. 102

(2 MARKS)

2. Computation of Number of Shares to be issued

If Dividends are -	Not Paid	Paid
Investment [I_1]	Rs. 10,00,000	Rs. 10,00,000
Retained Earnings available [X_1]	Rs. 5,00,000	5,00,000 – Dividend 1,00,000 = Rs. 4,00,000
Further Equity Raised [mP_1]	Rs. 5,00,000	Rs. 6,00,000
Price at Yr. End [WN 3] (P_1)	Rs. 112	Rs. 102
No. of Shares Issued [m] = $\frac{mP_1}{P_1}$	$\frac{5,00,000}{112} = 4,464$ Shares	$\frac{6,00,000}{102} = 5,883$ Shares

(3 MARKS)

3. Value under MM Dividend Irrelevance Model

Current Market Value	= No. of shares at the beginning (n) x MPS (P_0) = 10,000 x Rs. 100 per share = Rs. 10,00,000

PV of Market Value at year end if Dividends are paid	$\frac{(n+m)P_1 - I_1 + X_1}{1+K_e} = \frac{\left(\begin{matrix}10,000 \text{ Shares} + 5,883 \text{ Shares}) \text{ x} \\ \text{Rs.102-Rs.10,00,000+Rs.5,00,000}\end{matrix}\right)}{1+12\%}$ $= \frac{15,883 \text{ Shares x } 102 - \text{Rs.5,00,000}}{1+0.12} = \frac{Rs.16,20,000 - Rs.5,00,000}{1.12} = Rs.10,00,000$
PV of Market Value at year end if Dividends are paid	$\frac{(n+m)P_1 - I_1 + X_1}{1+K_e} = \frac{\left(\begin{matrix}10,000 \text{ Shares} + 4,464 \text{ Shares}) \text{ x} \\ \text{Rs.112-Rs.10,00,000+Rs.5,00,000}\end{matrix}\right)}{1+12\%}$ = $= \frac{14,464 \text{ Shares x Rs.112-Rs.5,00,000}}{1+0.12} = \frac{Rs.16,20,000 - Rs.5,00,000}{1.12} = Rs.10,00,000$

Note : MM Approach does not affect the Market Value of the firm even if Dividend is paid or not paid, since the Firm Value under all the cases is same at Rs.10,00,000.

4. Practical Problems under MM Dividend Irrelevance Model

(a) Tax Rate difference between Ordinary Income and Capital Gains, (b) Presence of Transaction Cost and Flotation Cost, (c) Investors Preference for Current Income, because the future income is more uncertain.

(5 MARKS)

ANSWER – 5

(i) Payback Period of Projects

	C_0	C_1		C_2		C_3	
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. $\frac{12}{2,500}$ x 2,000						
D	-3,000 +	0	+	0	+		= 3 years

(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.

(3 MARKS)

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

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

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

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

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

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

3 years + $\frac{12}{4,098}$ x 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.

(4 MARKS)

(iv) Evaluation of Projects on NPV criterion

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

NPV = Rs. 6,806.2

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

NPV = Rs. 3,217.75

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

NPV = Rs. 3,720.3

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

NPV = 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.

(3 MARKS)