



J.K. SHAH[®]
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SUGGESTED SOLUTION

FINAL MAY 2019 EXAM

SUBJECT- SFM

Test Code – FNJ 7104

BRANCH - () (Date :)

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Answer 1:**(i) Expected cash flows:-**

Year			Net cash flows	P.V.	PV. @ 10%
0	(4,00,000 x 1)	=	(-) 4,00,000	1.000	(-)4,00,000
1 to 4	(1,00,000x0.3+1,10,000x0.5 + 1,20,000 x 0.2)	=	1,09,000	3.170	3,45,530
5	[1,09,000 + (20,000 x 0.3 + 50,000 x 0.5 + 60,000 x 0.2)]	=	1,52,000	0.621	94,392
			NPV =		39,922

(ii) ENPV of the worst case

1,00,000 x 3.790 = Rs. 3,79,000 (Students may have 3.791 also the values will change accordingly)

20,000 x 0.621 = Rs. 12,420/-

ENPV = (-) 4,00,000 + 3,79,000 + 12,420 = (-) Rs. 8,580/-

ENPV of the best case

ENPV = (-) 4,00,000 + 1,20,000 x 3.790 + 60,000 x 0.621 = Rs. 92,060/-.

(iii) (a) Required probability = 0.3

(b) Required probability = $(0.3)^5 = 0.00243$

(iv) The base case NPV = (-) 4,00,000 + (1,10,000 x 3.79) + (50,000 x 0.621)

= Rs. 47,950/-

ENPV = 0.30 x (-) 8580 + 0.5 x 47950 + 92060 x 0.20

= Rs. 39,813/-

Therefore,

$$\sigma_{\text{ENPV}} = \sqrt{0.3(-8580 - 39,813)^2 + 0.5(47950 - 39813)^2 + 0.2(92,060 - 39,813)^2}$$

= Rs. 35,800/-

Co efficient of variation = $35800/39813=0.899$

(v) Risk adjusted out of cost of capital of X Ltd. = 10% - 1% = 9%. NPV

Year	Expected net cash flow	PV @ 9%	
0	(-)4,00,000	1.000	(-)4,00,000
1 to 4	1,09,000	3.240	3,53,160
5	1,52,000	0.650	<u>98,800</u>
		ENPV =	<u>51,960</u>

Therefore, the project should be accepted.

(5 marks x 2 = 10 marks)

Answer 2:**Discounting Factor:**

Cost of finance 20% - Tax 35% = 13%.

(i) PV of cash outflows under leasing alternative

Year-end	Lease rent after taxes P.A.	PVIFA at 13%	Total P.V.
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1 – 5	Rs. 3,90,000	3.517	Rs. 13,71,630
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PV of cash outflows under buying alternative

Year end	Loan Instalment	Tax advantage on Interest	Tax advantage on Depreciation	Net Cash Outflow	PVIF at 13%	Total PV
1	6,68,673	1,40,000	1,75,000	3,53,673	0.885	3,13,001
2	6,68,673	1,21,193	1,31,250	4,16,230	0.783	3,25,908
3	6,68,673	98,624	98,438	4,71,611	0.693	3,26,826
4	6,68,673	71,542	73,828	5,23,303	0.613	3,20,785
5	6,68,673	38,819	55,371	5,74,483	0.543	<u>3,11,944</u>
		Total PV outflows				15,98,464
		Less: PV of Salvage Value (Rs. 4,00,000 * 0.543)				<u>2,17,200</u>
						13,81,264
		Less: PV of tax saving on short term capital loss (4,74,609 – 4,00,000) * 35% * .543				14,179
		NPV of Cash outflow				13,67,085

(2 marks)

Working Notes:

(1) Schedule of Debt Payment

Year-end	Opening balance	Interest @ 20%	Repayment	Closing Balance	Principal Amount
1	20,00,000	4,00,000	6,68,673	17,31,327	2,68,673
2	17,31,327	3,46,265	6,68,673	14,08,919	3,22,408
3	14,08,919	2,81,784	6,68,673	10,22,030	3,86,889
4	10,22,030	2,04,406	6,68,673	5,57,763	4,64,267
5	5,57,763	1,10,910*	6,68,673	0	5,57,763

*Balancing Figure

(1 mark)

(2) Schedule of Depreciation

Year	Opening WDV	Depreciation	Closing WDV
1	20,00,000	5,00,000	15,00,000
2	15,00,000	3,75,000	11,25,000
3	11,25,000	2,81,250	8,43,750
4	8,43,750	2,10,938	6,32,812
5	6,32,812	1,58,203	4,74,609

(1 mark)

(3) EMI = Rs. 20,00,000 / Annuity for 5 years @ 20% = i.e. Rs. 20,00,000 / 2.991 = Rs. 6,68,673.

Advice: Company is advised to borrow and buy not to go for leasing as NPV of cash outflows is lower in case of buying alternative. (1 mark)

Note: Students may note that the cost of capital of the company given in the question is 14% at which cash flows may also be discounted.

(ii) Evaluation from Lessor's Point of View

	(1)	(2)	(3)	(4)	(5)
Lease Rent	6,00,000	6,00,000	6,00,000	6,00,000	6,00,000
Less: Depreciation	<u>5,00,000</u>	<u>3,75,000</u>	<u>2,81,250</u>	<u>2,10,938</u>	<u>1,58,203</u>
EBT	1,00,000	2,25,000	3,18,750	3,89,062	4,41,797
Less: Tax @ 35%	<u>35,000</u>	<u>78,750</u>	<u>1,11,563</u>	<u>1,36,172</u>	<u>1,54,629</u>
EAT	65,000	1,46,250	2,07,187	2,52,890	2,87,168
Add: Depreciation	<u>5,00,000</u>	<u>3,75,000</u>	<u>2,81,250</u>	<u>2,10,938</u>	<u>1,58,203</u>
Cash Inflows	<u>5,65,000</u>	<u>5,21,250</u>	<u>4,88,437</u>	<u>4,63,828</u>	<u>4,45,371</u>
PV factor @ 14%	0.877	0.769	0.675	0.592	0.519
PV of inflows	4,95,505	4,00,841	3,29,695	2,74,586	2,31,148

(3 marks)**Evaluation:**

Aggregate PV of cash inflows	17,31,775
Add: PV of salvage value (4,00,000 × 0.519)	2,07,600
Add: Tax shelter on short-term capital loss (4,74,609 – 4,00,000) × 0.35 × 0.519	<u>13,553</u>
PV of all cash inflows	19,52,928
Cost of the machine	20,00,000
NPV	-47,072

(2 marks)

Hence, leasing at this rate is not feasible.

Answer 3:**A When dividend is paid**

(a) Price per share at the end of year 1

$$100 = \frac{1}{1.10} (\text{Rs. } 5 + P_1)$$

$$110 = \text{Rs. } 5 + P_1$$

$$P_1 = 105$$

(b) Amount required to be raised from issue of new shares

$$\text{Rs. } 5,00,000 - (\text{Rs. } 2,50,000 - \text{Rs. } 1,25,000)$$

$$\text{Rs. } 5,00,000 - \text{Rs. } 1,25,000 = \text{Rs. } 3,75,000$$

(c) Number of additional shares to be issued

$$\frac{3,75,000}{105} = \frac{75,000}{21} \text{ shares or say } 3572 \text{ shares}$$

(d) Value of M Ltd.

$$(\text{Number of shares} \times \text{Expected Price per share})$$

$$\text{i.e., } (25,000 + 3,572) \times \text{Rs. } 105 = \text{Rs. } 30,00,060$$

(5 marks)**B When dividend is not paid**

(a) Price per share at the end of year 1

$$100 = \frac{P_1}{1.10}$$

$$P_1 = 110$$

(b) Amount required to be raised from issue of new shares

$$\text{Rs. } 5,00,000 - 2,50,000 = 2,50,000$$

(c) Number of additional shares to be issued

$$\frac{2,50,000}{110} = \frac{25,000}{11} \text{ shares or say 2273 shares.}$$

(d) Value of M Ltd.,
 $(25,000 + 2273) \times \text{Rs. } 110$
 $= \text{Rs. } 30,00,030$

Whether dividend is paid or not, the value remains the same.

(5 marks)

Answer 4:

(A)

(i) On the basis of standard deviation project X be chosen because it is less risky than Project-Y having higher standard deviation.

(ii) $CV_x = SD / ENPV = 90000 / 122000 = 0.738$

$$CV_y = 120000 / 225000 = 0.533$$

On the basis of Co-efficient of Variation (C.V.) Project X appears to be more risky and Y should be accepted.

(iii) However, the NPV method in such conflicting situation is best because the NPV method is in compatibility of the objective of wealth maximization in terms of time value.

(5 marks)

(B)

First we calculate cost of Equity (K_e)/PE Ratio

$$D_1 = 1920000 / 1200000 = \text{Rs. } 1.6$$

$$P_0 = \text{Rs. } 10$$

$$K_e = D / P = \text{Rs. } 1.6 / 10 = 16\%$$

$$P/E = 10 / 1.6 = 6.25$$

Now we shall compute NPV of the project

NPV =

$$\frac{-800000}{(1+0.16)^1} + \frac{-800000}{(1+0.16)^2} + \frac{300000}{(1+0.16)^3} + \frac{360000}{(1+0.16)^4} + \frac{360000}{0.16} \times \frac{1}{(1+0.16)^5}$$

$$= -6,89,655 - 5,94,530 + 1,92,197 + 1,65,687 + 10,71,254$$

$$= 1,44,953$$

As NPV of the project is positive, the value of the firm will increase by Rs. 1,44,953 and spread over the number of shares e.g. 12,00,000, the market price per share will increase by 12 paise. **(8 marks)**

Answer 5:

Working Notes:

Calculation of Equivalent Annual Cost

	Machine A	Machine B
Cash Outlay	Rs. 24,00,000	Rs. 40,00,000

Less: PV of Salvage Value		
4,00,000 x 0.1486	Rs. 59,440	
4,00,000 x 0.2394		Rs. 95,760
Annunity Factor	0.1175	0.1315
	Rs. 2,75,016	Rs. 5,13,408

(2 marks)

Computation of Cost Per Unit

	Machine A	Machine B
<i>Annual Output (a)</i>	2500 x 60 x 200 = 3,00,00,000	2500 x 60 x 400 = 6,00,00,000
<i>Annual Cost (b)</i>	Rs.	Rs.
Wages	1,00,000	1,40,000
Indirect Material	4,80,000	6,00,000
Repairs	80,000	1,00,000
Powers	2,40,000	2,80,000
Fixed Cost	60,000	80,000
Equivalent Annual Cost	2,75,016	5,13,408
Total	12,35,016	17,13,408
Cost Per Unit (b)/(a)	0.041167	0.02860

(4 marks)

Decision: As the unit cost is less in proposed Plant B, it may be recommended that it is advantageous to acquire Plant B.

(1 mark)