Daffodil Institute of Information Technology (DIIT)

Third Year, Sixth Semester

BBA (Honors) in Tourism and Hospitality Management (THM)

Fundamentals of Finance

Chapter-5

INTRODUCTION TO CAPITAL BUDGETING (Math)

1. A company is considering the purchase of a new machine that cost Tk. 60,000. The company uses straight line method of depreciation. The company's tax rate is 40%. The annual cash flows have the following projections:

Year	Cash flow
1	21,000
2	29,000
3	36,000
4	16,000
5	12,000

(i) If the cost of capital is 10% what is the net present value?

(ii) What is the internal rate of return?

(iii) Should the project be accepted? Why?

(iv) If the reinvestment assumption of IRR method is used, what will be the total value of inflows after five year assuming 14% is the IRR?

Workings-1: Calculation of Net cash Benefit

Table: Calculation of Net Cash Benefit

Year	CFBTD	Depreciation	CFBT	Tax@35%	EAT/NA	NCB
(1)	(2)	(3)	4=(2-3)	5=(4×40%)	6=(4-5)	7=(3+6)
1	21,000	12000	9000	3600	5400	17400
2	29,000	12000	17000	6800	10200	22200
3	36,000	12000	24000	9600	14400	26400
4	16,000	12000	4000	1600	2400	14400
5	12,000	12000	0	0	0	12000
Total					**=32400**	

Workings-2: Calculation of annual depreciation

$$\text{Depreciation} = \frac{Cost\ of\ the\ Machine - Salvage\ value}{Expected\ life\ of\ Mschine}$$

$$= \frac{60000-0}{5}$$

$$= 12000$$

Requirement-1: Calculation of Net Present Value (NPV)

Net Present Value (NPV) = $\left[\frac{NCB_1}{(1+i)^1}+\frac{NCB_2}{(1+i)^2}+\cdots\cdots+\frac{NCB_n}{(1+i)^n}\right]-NCO$

$$=\left[\frac{17400}{(1+.10)^1}+\frac{22200}{(1+.10)^2}+\frac{26400}{(1+.10)^3}+\frac{14400}{(1+.10)^4}+\frac{12000}{(1+.10)^5}\right]-60000$$

$=72867.17-60000$

$= 12867.17$ Ans.

Requirement-2: Calculation of Internal rate of return (IRR)

Workings-3

Let, Interest rate= 20%

Then, NPV= $\left[\frac{NCB_1}{(1+i)^1}+\frac{NCB_2}{(1+i)^2}+\cdots\cdots+\frac{NCB_1}{(1+i)^1}\right]-NCO$

$$=\left[\frac{17400}{(1+.20)^1}+\frac{22200}{(1+.20)^2}+\frac{26400}{(1+.20)^3}+\frac{14400}{(1+.20)^4}+\frac{12000}{(1+.20)^5}\right]-60000$$

$=56961-60000$

$= -3038$

Internal rate of return (IRR) $=Lr+\frac{NPV_{Lr}}{NPV_{Lr}-(-NPV_{Hr})}(Hr-Lr)$

$$=.10+\frac{12867}{12867-(-3038)}\times(.20-.10)$$

$$=.10+\frac{12867}{15905}\times.10$$

$=.10+.808999\times.10$

$=.10+.080899$

$=.180899$

$=18.09\%$ Ans.

Requirement-3: Decision: Since NPV is positive, so the project should be accepted.

Requirement-4: Terminal Value (TV)

We know,

TV= $CF_1(1+IRR)^{n-1}+ CF_2(1+IRR)^{n-2} +CF_3(1+IRR)^{n-3} +CF_4(1+IRR)^{n-4} +CF_5(1+IRR)^{n-5}$

= $21000(1+.14)^4+ 29000(1+.14)^3+36000(1+.14)^2+ 16000(1+.14)^1+ 12000(1+.14)^0$

= 35468+ 42965+ 46786+ 18240+ 12000

= 155459 Ans.