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. NEXUX Ltd. Is considering an investment proposal to install new equipment costing TK. 60,000. The facility has life expectancy of five years and has no salvage value. Assume that the company uses straight line depreciation. The tax rate is 35 percent. The cash-flows before depreciation and tax (CFBTD) from the investment are as follows:-

Year	CFBTD(Taka)
1	10,000
2	12,000
3	15,000
4	20,000
5	25,000

Requirement:
(i) Payback period;
(ii) Average rate of return;
(iii) Net present value at 10% discount rate;
(iv) Internal rate of return.

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=(4×35%)	6=(4-5)	7=(3+6)
1	10000	12000	(2000)	(700)	(1300)	10700
2	12000	12000	0	0	0	12000
3	15000	12000	3000	1050	1950	13950
4	20000	12000	8000	2800	5200	17200
5	25000	12000	13000	4550	8450	20450
Total					**=14300**	

Workings-2: Calculation of annual depreciation

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

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

$$= 12000$$

Workings-3: Calculation of Cumulative Net Cash Benefit

Year	NCB	CNCB
(1)	(2)	(3)
1	10700	10700
2	12000	22700
3	13950	36650
4	17200	53850
5	20450	74300

Requirement-1: Calculation of Payback Period

Payback period (PBP) = $A + \dfrac{NCO - CNCB_A}{NCB_{Next}}$

$$= 4 + \dfrac{60000 - 53850}{20450}$$

$$= 4 + .300$$

$$= 4.30 \text{ Years Ans.}$$

$$= 4 \text{ yrs 3 months 18 days}$$

Requirement-2: Calculation of Average rate of return (ARR)

Average rate of return (ARR) = $\dfrac{\text{Average Net Earnings}}{\text{Average Investment}} \times 100$

$$= \dfrac{14300 \div 5}{60000 \div 2} \times 100$$

$$= \dfrac{2860}{30000} \times 100$$

$$= 0.09533 \times 100$$

$$= 9.53\% \text{ Ans.}$$

Requirement-3 Calculation of Net Present Value (NPV)

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

$$= \left[\dfrac{10700_1}{(1+.10)^1} + \dfrac{12000_2}{(1+.10)^2} + \dfrac{13950_3}{(1+.10)^3} + \dfrac{17200_4}{(1+.10)^4} + \dfrac{20450_5}{(1+.10)^5} \right] - 60000$$

$$= 54561 - 60000$$

$$= -5439 \text{ Ans.}$$

Requirement-4: Calculation of Internal rate of return (IRR)

Let, Interest rate= 6%

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

$$= [\frac{10700_1}{(1+.06)^1} + \frac{12000_2}{(1+.06)^2} + \frac{13950_1}{(1+.06)^3} + \frac{17200_1}{(1+.06)^4} + \frac{20450_1}{(1+.06)^5} - 60000$$

$=61392.426 - 60000$

$= 1392.426$

= 1392 Ans.

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

$=.06 + \frac{1392}{1392-(-5439)} \times (.10 - .06)$

$=.06 + \frac{1392}{6831} \times .04$

$=.06+.20377\times.04$

$=.06+.00815$

$=.06815$

=6.81% Ans.