ADVANCED CAPITAL BUDGETING DECISIONS

CLASS 3

Topic Simulation

Question 1:

XYZ Ltd. is evaluating an investment proposal which has uncertainty associated with the three important aspects: the original cost, the useful life, and the annual net cash flows. The three probability distribution for these variables are shown below:

Original cost		Useful life		Annual net cash inflows	
Value	**Probability**	**Period**	**Probability**	**Value**	**Probability**
Rs.50,000	0.4	4 years	0.3	Rs.12,000	0.2
Rs.60,000	0.5	6 years	0.4	Rs.19,000	0.2
Rs.70,000	0.1	8 years	0.3	Rs.25,000	0.3
				Rs.30,000	0.3

The firm wants to perform five simulation runs. The firm's cost of capital is 16% p.a. and the risk-free rate is 7% p.a. for simplicity it is assumed that these two values are known for certain and will remain constant over the life of the project.

You are required to simulate the probability distributions of original cost, useful life and annual net cash inflows, and generate five simulated NPV's using the following sets of random numbers:

53, 30, 86, 62, 11; 58, 15, 20, 25, 37; and 04, 50, 80, 10, 74 respectively each of the five simulations runs.

Question 2:

Zenith Chemicals is evaluating an investment project whose net present value has been modeled as follows:

$$\sum_{t=1}^{n}\left[CF_t / (1+i)^t\right] - I$$

Where i→ Risk free interest rate, I→ initial investment are parameters, CF = Annual Cash Flow

With i = 12%, I = ₹ 2,50,000, CFt & n stochastic exogenous variables with the following distribution will be as under:

Annual Cash Flow		Project Life	
Value (₹)	**Probability**	**Value (Year)**	**Probability**
20,000	0.07	5	0.15
30,000	0.03	6	0.10
40,000	0.15	7	0.20
50,000	0.25	8	0.30
60,000	0.10	9	0.10
65,000	0.25	10	0.15
90,000	0.15		

The firm wants to perform ten simulation runs of its project's life and calculate expected NPV. You are required to simulate the probability distributions of Annual Cash Flow and Project Life, using the following sets of random numbers:

Random Number

53479	81115	98036	12217	59526
97344	70328	58116	91964	26240
66023	38277	74523	71118	84892
99776	75723	03172	43112	83086
30176	48979	92153	38416	42436
81874	83339	14988	99937	13213
19839	90630	71863	95053	55532
09337	33435	53869	52769	18801
31151	58295	40823	41330	21093
67619	52515	03037	81699	17106

Note: For random numbers, begin from the top of the table on the left and read any pair of adjacent columns, column/row wise.