

# ***ADVANCED CAPITAL BUDGETING DECISIONS***

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***CLASS 1 CW***

**Topic** Decision Tree

**Question 1:**

Personal Care Products Ltd. (PCPL) is known for its innovative beauty care products. The company's R&D has developed a new product named 'Nature' which can fit into its beauty care product portfolio. Initially PCPL is facing with a decision whether to test market before launching 'Nature' which will cost Rs.1,500,000. If the product is launched without test marketing the probability of success is 0.60 and failure is 0.40.

If 'Nature' is launched by PCPL and proves to be a success, the company's wealth, in terms of NPV, increases by Rs.12,500,000 (before payment of test marketing expenses) while the failure leads to a loss, in terms of NPV by Rs.6,250,000, (before payment of test marketing expenses).

Probability of positive results from test market is 0.52 while that of negative result is 0.48. PCPL's experience shows that when a product is launched following a positive result the probability of product's success is 0.92 and that of failure is 0.08. If the product is launched following a negative result the probability of success is 0.25 while that of failure is 0.75.

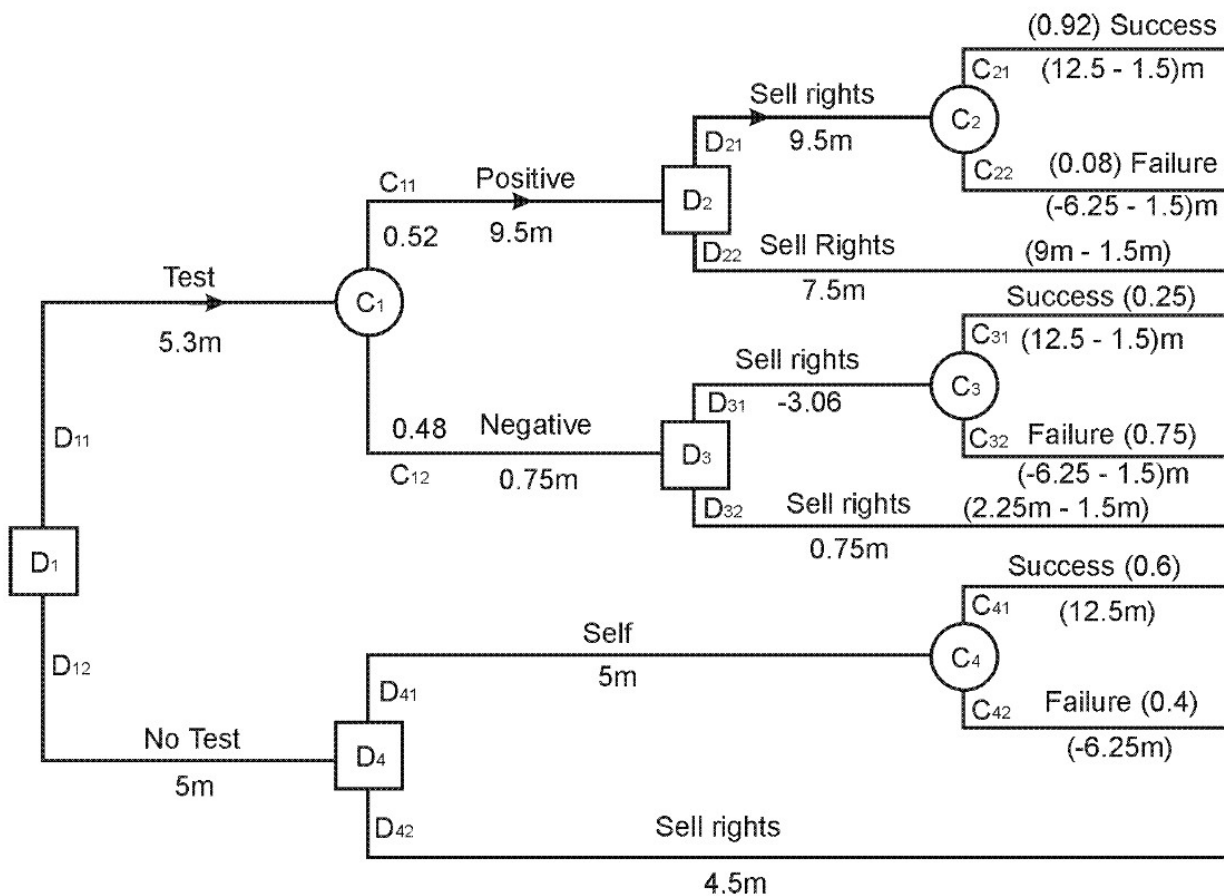
The second decision the PCPL faces is whether to sell the commercial rights of 'Nature' to some other company. It can do so either before or after test marketing. Selling the rights before test marketing gives the company an NPV of Rs.4,500,000 while selling the rights after test marketing has two outcomes: if the result is positive the company can get an NPV of Rs.9,000,000 (before payment of test marketing expenses) and if it is negative it will have an NPV of Rs.2,250,000 (before payment of test marketing expenses).

You are required to

- a. Draw a decision tree, which describes the sequence of decisions
- b. Suggest an optimal decision if PCPL wants to maximize expected NPV.

**ANSWER:**

a.



b. Starting from the right-hand end of decision tree, the expected monetary values (EMVs) at chance forks  $C_2$ ,  $C_3$  and  $C_4$  are:

$$EMV(C_2) = \text{Rs.}9.50 \text{ million}$$

$$EMV(C_3) = \text{Rs.}3.06 \text{ million}$$

$$EMV(C_4) = \text{Rs.}5.00 \text{ million}$$

Now,  $EMV(D_2) = \text{Rs.}9.50 \text{ million}$

$$EMV(D_3) = \text{Rs.}0.75 \text{ million}$$

$$EMV(D_4) = \text{Rs.}5.00 \text{ million}$$

Now,  $EMV(C_1) = \text{Rs.}5.30 \text{ million}$

Now,  $EMV(D_1) = \text{Rs.}5.30 \text{ million}$

So, we see that  $D_{11}$  i.e. conducting test market is the most desirable alternative.