Chapter 3

THE LEARNING CURVE

Exercise 01

Captain Mendis has designed a new type of sailing boat, for which the cost of the first boat to be produced has been estimated as follows.

	Rs Mn
Materials	5
Labour (800 hours ? Rs. 5K per hour)	4
Overhead (150% of labour cost)	6
	15
Profit mark-up (20%)	3
Sales price	18

It is planned to sell all the yachts at full cost plus 20%. An 80% learning curve is expected to apply to the production work. The management accountant has been asked to provide cost information so that decisions can be made on what price to charge.

(a) What is the separate cost of a second yacht?
(b) What would be the cost per unit for a third and a fourth yacht, if they are ordered separately later on?
(c) If they were all ordered now, could Captain Kitts quote a single unit price for four yachts and eight yachts?

Exercise 02

Bortamord anticipates that a 90% learning curve will apply to the production of a new item. The first item will cost Rs. 2,000 in materials, and will take 500 labour hours. The cost per hour for labour and variable overhead is Rs. 5.

Required
Calculate the total cost for the first unit and for the first 8 units.

Exercise 03

Suppose, for example, that an 80% learning curve applies to production of item ABC. To date (the end of June) 230 units of ABC have been produced. Budgeted production for July is 55 units. The cost of the very first unit of ABC, in January, was Rs. 120,000.

Required

Calculate the budgeted total labour cost for July.

Exercise 04

A company needs to calculate a new standard cost for one of its products. When the product was introduced, the standard variable cost of the first unit was as follows.

Cost per unit	**Rs '000**
Direct material 10 kg at Rs. 3K per kg	30
Direct labour 10 hours at Rs. 9K per hour	90
Variable overhead 10 hours at Rs. 5K per hour	50
Total	170

During the following year, a 90% learning curve was observed. The cumulative production at the end of the third quarter was 50 units and the budgeted production for the fourth quarter is 10 units.

Required

(a) **Calculate** the standard cost per unit for the fourth quarter assuming that the 90% learning curve still applies.

(b) **Calculate** the standard cost per unit for the fourth quarter assuming the learning curve had reached a **steady state** (ie peak efficiency was reached after the 50th unit was produced).

Exercise 05

The following variances have been calculated in respect of a new product;

Direct labour efficiency variance Rs. 14.7m Favourable
Direct labour rate variance Rs. 5.25m Adverse

The variances were calculated using standard cost data which showed that each unit of the product was expected to take eight hours to produce at a cost of Rs. 15,000 per hour. Actual output of the product was 560 units and actual time worked in the manufacture of the product totalled 3,500 hours at a cost of Rs. 57.75m.

However, the production manager now realizes that the standard time of eight hours per unit was the time taken to produce the first unit and that a learning rate of 90% should have been anticipated for the first 600 units.

Required

Calculate planning and operating variances following the recognition of the learning curve effect.

Exercise 06

P Cooperates a standard costing system. The standard labour time per batch for its newest product was estimated to be 200 hours, and resource allocation and cost data were prepared on this basis.

The actual number of batches produced during the first six months and the actual time taken to produce them is shown below:

Month	Incremental no. batched produced each month	Incremental labour hours taken to produce the batch
June	1	200.00
July	1	152.00
August	2	267.52
September	4	470.80
October	8	1,090.32
November	16	2,180.64

Required (a) Calculate the monthly learning rate that arose during the period.
(b) Identify when the learning period ended and briefly discuss the implications of this for P Co.

Exercise 07

Tech World is a company which manufactures mobile phone handsets. From its past experiences, Tech World has realized that whenever a new design engineer is employed, there is a learning curve with a 75% learning rate which exists for the first 15 jobs.

A new design engineer has just completed his first job in five hours.
Note. At the learning rate of 75%, the learning factor (b) is equal to -0·415.

How long would it take the design engineer to complete the sixth job?