Exercise walk-through

Long-Run Production Costs ▪ 3.3

eXercise

You must be able to

- explain that all inputs are variable in the **long run**, so there are no fixed costs
- describe the **long-run average total cost (LRATC) 长期平均总成本** curve
- identify **economies of scale 规模经济**, constant returns, and **diseconomies of scale 规模不经济**
- define the **minimum efficient scale 最小有效规模**

Method — The long run

All inputs are variable, so there are **no fixed costs**. LRATC is the **envelope** of the short-run cost curves.

Method — Returns to scale

- **Economies of scale** — LRATC **falls** as output rises.
- **Constant** returns — LRATC flat.
- **Diseconomies of scale** — LRATC **rises**.

Method — Minimum efficient scale

The **lowest** output at which LRATC reaches its minimum.

Practice 2.1 ▪ 1 mark

State why there are no fixed costs in the long run.

Solution 2.1

Method: The long run

Worked steps

all inputs are variable, so none are fixed **B1**.

Practice 2.2 ▪ 1 mark

Define economies of scale.

Solution 2.2

Method: Returns to scale

Worked steps

falling long-run average total cost as output rises **B1**.

Practice 2.3 ▪ 1 mark

State what happens to LRATC when a firm has diseconomies of scale.

Solution 2.3

Method: Returns to scale

Worked steps

it rises **B1**.

Exam-style 3.1 ▪ 1 mark

Economies of scale occur when, as output rises, LRATC

A rises

B falls

C stays constant

D is zero

Solution 3.1

Method: Returns to scale

A rises

B falls ✓

C stays constant

D is zero

Worked steps

B.

Exam-style 3.2 ▪ 1 mark

The minimum efficient scale is the lowest output at which

A ATC is maximized

B LRATC is minimized

C MC is zero

D profit is zero

Solution 3.2

Method: Minimum efficient scale

A ATC is maximized

B LRATC is minimized ✓

C MC is zero

D profit is zero

Worked steps

B.

Exam-style 3.3 ▪ 1 mark

A firm doubles all its inputs and finds that output **more than** doubles.

(a) Name what the firm is experiencing.

(b) State what happens to LRATC.

(c) State one source of economies of scale.

Solution 3.3

Method: Returns to scale

Worked steps

(a) economies of scale (increasing returns to scale) **B1**. (b) it falls **B1**. (c) any one of: specialization of labour, bulk buying, spreading fixed costs **B1**.