



Question Paper

Module 6:	Power and Automation	
Date: 15 May 2019	Time: 09:30 – 12:00	Duration: 2½ hours

You should have the following for this examination: **one answer book, pencil, pen and ruler.**

All questions carry equal marks. The maximum marks for each section within a question are shown. Answer **ALL SEVEN** questions, starting each new question (1-7) on a **new** page of the answer book.

1.
 - a) **With reference to the benefits of an automated mill over a mechanised mill, explain how automation can improve the efficiency of the milling process.** (6 marks)
 - b) **State TWO ways in which the ongoing trend of integration of process control into business management systems might benefit millers in the next decade.** (4 marks)
 - c) **List FOUR quality tests that should be carried out by water suppliers.** (2 marks)
2.
 - a) **Describe THREE types of motor starter.** (6 marks)
 - b) **State the objectives of the EU Minimum Energy Performance Standard.** (4 marks)
 - c) **State FOUR points to be observed for vee-belts to work at maximum performance.** (2 marks)
3.
 - a) **State the three fan laws.** (3 marks)
 - b) **Explain why it might be more economical to change a fan instead of speeding it up.** (4 marks)
 - c) **With the aid of a labelled sketch, describe the operation of a pulse jet filter.** (5 marks)
4.
 - a) **Describe the TWO types of rotary seal.** (2 marks)
 - b) **With the aid of a cross-sectional sketch, describe the operation of a rotary blower.** (4 marks)
 - c) **Explain why pneumatic conveying is not often used in the screenroom.** (2 marks)
 - d) **Describe the use of pressure switches in blowlines.** (4 marks)

continued overleaf

5. a) Describe **THREE** methods used to measure weight. (6 marks)
- b) List **SIX** milling examples of where it is essential to measure weight. (3 marks)
- c) Explain why it is important to monitor bin stocks. (3 marks)
6. a) Describe the basic structure of a PLC system. (7 marks)
- b) State **FOUR** advantages of PLCs over relay control systems. (2 marks)
- c) Describe the **TWO** main types of PLC programme storage. (2 marks)
- d) State the **TWO** main types of loop controllers used in process control systems. (1 mark)
7. a) State the **FOUR** properties that input cards provide to a PLC, describing the significance of each. (8 marks)
- b) Sketch and describe a complete process control system. (4 marks)