



Question Paper

Module 6:	Power and Automation	
Date: 10 May 2017	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) List the **FOUR** stages of supplying electricity to factories. (2 marks)
 - b)
 - i) Describe the first planning stage in designing a mill's electrical distribution system. (2 marks)
 - ii) Define the term "Diversity Factor" and describe how it can be applied. (2 marks)
 - c)
 - i) Define the terms "Direct Current" and "Alternating Current". (2 marks)
 - ii) Describe both Direct Current and Alternating Current, fully explaining the differences between them. (4 marks)

2.
 - a) With the aid of a labelled diagram, describe how a pulse jet filter works. (5 marks)
 - b) Define what is meant by the term "air to cloth ratio". (1 mark)
 - c) Describe **THREE** factors that influence the choice of air to cloth ratio. (3 marks)
 - d) Describe why a UK flour mill must have effective dust collectors installed. (3 marks)

3.
 - a) State **FOUR** points to be observed to ensure Vee Belts work at maximum performance. (4 marks)
 - b) List **TWO** other common types of belt drive. (2 marks)
 - c) Sketch a typical positive pressure conveying system, labelling the essential components. (6 marks)

4.
 - a) Describe the hazardous zone classifications for dusts and the corresponding equipment categories. (6 marks)
 - b) Explain the relevance of terminal velocity in screenroom aspirators. (4 marks)
 - c) Explain why compressed air should be dried and conditioned. (2 marks)

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5. a) i) Explain why it is essential to measure position. (2 marks)
ii) Describe FOUR examples of where it is essential to measure position. (4 marks)
iii) List FOUR devices used to measure position. (2 marks)
- b) Describe the FOUR main forms of Tachometer. (4 marks)
6. a) Describe the basic structure of a PLC system. (6 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 controller used in process control systems. (2 marks)
7. a) Describe a feedback loop, explaining how it offers advantages in wheat damping systems. (4 marks)
- b) Describe how process control systems are used in the following areas:
- i) Weighbridge; (2 marks)
 - ii) Start up, shut down and suspend; (2 marks)
 - iii) On-line flour analysis; (2 marks)
 - iv) Administration. (2 marks)