



**2850-253 DECEMBER 2014**

**Level 2 Certificate/Diploma in Engineering (IVQ)**

Principles of manufacturing technology

**Monday 8 December 2014**  
**09:30 – 11:30**

**You should have the  
following for this examination**

- one answer book
- drawing instruments
- calculator

---

**General instructions**

- All intermediate steps in calculations **must** be shown.
- All questions do **not** carry equal marks. The maximum marks for each section within a question are shown.
- All pressures are absolute unless otherwise stated.
- Answer **all** questions.

Practice

- 1 a) Name **four** departments, other than stores and sales, within a manufacturing organisation. (4 marks)  
b) Describe the function of **two** departments named in part a). (4 marks)  
(Total marks 8)
- 2 a) State the type of organisation for **each** of the following companies that  
i) is a production line filling cans with soft drinks  
ii) constructs tower cranes on site  
iii) provides hand tools  
iv) carries out portable electrical appliance testing. (4 marks)  
b) Classify, as light, medium or heavy engineering, **each** of the organisations listed in part a). (4 marks)  
(Total marks 8)
- 3 a) State **four main** differences between jobbing and mass production. (4 marks)  
b) State which type of manufacturing process fits **each** of the following descriptions.  
i) A small quantity of products to be produced once.  
ii) Production of a very large quantity of the same type of product.  
iii) An individual product.  
iv) Medium scale manufacturing for products produced on a regular basis. (4 marks)  
(Total marks 8)
- 4 a) State the **main** difference between general purpose and dedicated equipment. (1 mark)  
b) Identify **each** of the following types of equipment as general purpose, computerised or dedicated.  
i) Hammer.  
ii) Simulator.  
iii) Test equipment.  
iv) Pulley extractor.  
v) Lathe. (5 marks)  
(Total marks 6)
- 5 a) Describe the **main** difference between thermosetting plastic and thermoplastic. (2 marks)  
b) Classify **each** of the following metals as ferrous or non-ferrous.  
i) Copper alloy.  
ii) Aluminium.  
iii) Stainless steel.  
iv) Cast iron. (4 marks)  
c) Describe **each** of the following properties of materials.  
i) Elasticity.  
ii) Toughness. (4 marks)  
(Total marks 10)
- 6 Name **ten** forms of material supply. (10 marks)  
(Total marks 10)

- 7 a) Specify **one** non-permanent fastening suitable for **each** of the following situations. (3 marks)
- i) Securing wheels to a vehicle.
  - ii) Positive drive of a pulley system.
  - iii) Fixing a bracket to a wall.
- b) Specify **one** permanent fastening for **each** of the following situations. (3 marks)
- i) Jointing the conductors of copper cables.
  - ii) Jointing brass components.
  - iii) Joining together sections of steel pipe.
- c) Describe how a non-permanent fixing would be used to stop a castellated nut from vibrating loose when used on a wheel hub assembly. (2 marks)
- d) Give **two** examples of permanent fixing methods that could be used to join together two sides of a shape cut from a sheet of copper. (2 marks)
- (Total marks 10)
- 8 a) State **four** economic factors which need consideration in manufacturing processes. (4 marks)
- b) Describe **each** of the following terms in reference to economic costs of production. (6 marks)
- i) Breakeven.
  - ii) Capital.
  - iii) Inflation.
- (Total marks 10)
- 9 a) State **four** production requirements to manufacture routine components in an engineering organisation. (4 marks)
- b) Describe the function of any **three** of the production requirements stated in part a). (6 marks)
- (Total marks 10)
- 10 a) State **two** information requirements to produce components to specification. (2 marks)
- b) With reference to the selection of the correct material for a component manufacturing process. (4 marks)
- i) State **two** items of information that are required.
  - ii) Give **one** typical example for **each** item of information identified in part b) i).
- (Total marks 6)
- 11 a) Name **two** direct costs other than direct labour. (2 marks)
- b) Describe **one** of the costs named in part a). (2 marks)
- c) Name **two** indirect costs other than heating. (2 marks)
- d) Describe **one** of the costs named in part c). (2 marks)
- (Total marks 8)
- 12 Draw a flow chart to show the stages, including quality checks, for producing a component on a lathe. (6 marks)
- (Total marks 6)