Centre Number

Student Number

2008

**HIGHER SCHOOL CERTIFICATE
EXAMINATION**

Industrial Technology
Metals and Engineering Industries

General Instructions

- Reading time – 5 minutes
- Working time – $1\frac{1}{2}$ hours
- Write using black or blue pen
- Draw diagrams using pencil
- Board-approved calculators may be used
- Write your Centre Number and Student Number at the top of this page and pages 5, 9, 13 and 17

Total marks – 100

(**Section I**) Pages 2–12

60 marks

- Attempt Questions 1–3
- Allow about 55 minutes for this section

(**Section II**) Pages 13–20

40 marks

- Attempt Questions 4–5
- Allow about 35 minutes for this section

Section I

60 marks
Attempt Questions 1–3
Allow about 55 minutes for this section

Answer the questions in the spaces provided.

<div style="text-align: right">Marks</div>

Use the following information to answer Questions 1 and 2.

IND-TECH is a company in the metals and engineering industry seeking to increase its market share by establishing an overseas facility.

Question 1 (20 marks)

(a)   Identify TWO sources of finance that IND-TECH might use to fund the establishment of the overseas facility.   **2**

    ....

    ....

    ....

    ....

(b)   How can IND-TECH locate and evaluate emerging technology?   **3**

    ....

    ....

    ....

    ....

    ....

    ....

    ....

    ....

Question 1 continues on page 3

Question 1 (continued)

(c)   Explain issues that may have influenced IND-TECH's decision to establish the overseas facility.   **4**

....

....

....

....

....

....

....

....

....

....

....

(d)   How could the introduction of the new facility affect the marketability of IND-TECH's products?   **4**

....

....

....

....

....

....

....

....

....

....

Question 1 (continued)

(e) IND-TECH has identified quality control as a potential area of concern when overseas operations commence.

7

Evaluate strategies that can be implemented to establish and monitor the required standard of quality.

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

End of Question 1

Section I (continued)

Marks

Question 2 (20 marks)

(a) Outline TWO issues that may be included in an *Environmental Impact Statement* (EIS).

2

....

....

....

....

(b) Why is it important to have an effective occupational health and safety (OHS) policy in place when the new facility is established?

3

....

....

....

....

....

....

....

....

....

Question 2 (continued)

(c) How could IND-TECH ensure that equal employment opportunity (EEO) principles are followed in the recruitment of new staff?

4

....

....

....

....

....

....

....

....

....

....

(d) Evaluate a range of computing applications that could be used to maintain communication between the local facility and the overseas facility.

4

....

....

....

....

....

....

....

....

....

....

Question 2 (continued)

(e) IND-TECH proposes to relocate some employees to the overseas facility to assist in setting it up and training staff.   **7**

Analyse this proposal from the perspective of both IND-TECH and the employees who would be relocating.

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

End of Question 2

BLANK PAGE

Industrial Technology
Metals and Engineering Industries

Centre Number

Section I (continued)

Student Number

Marks

Question 3 (20 marks)

(a)   Name TWO software applications that can be used to graph production costs.   **2**

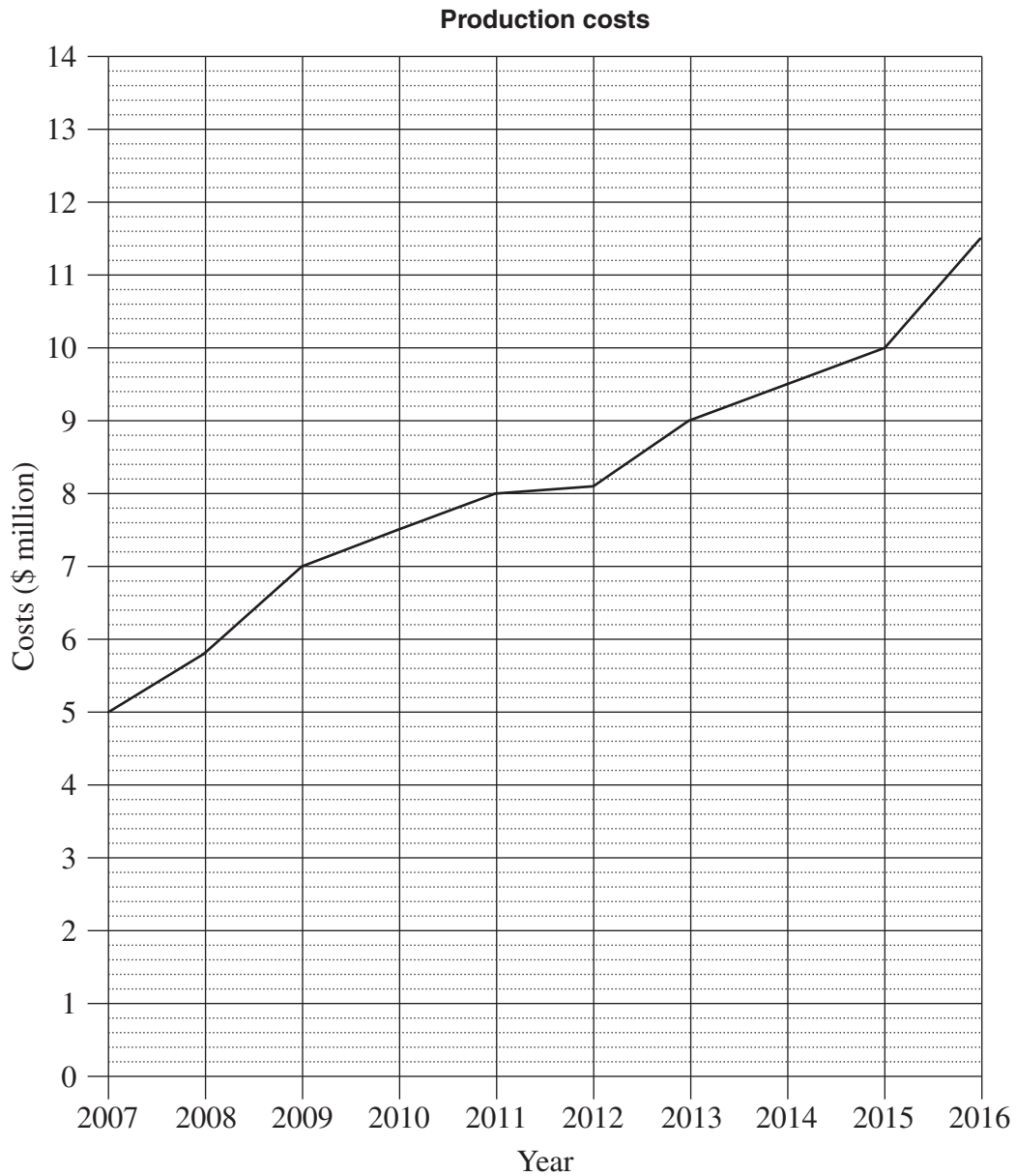...

....

....

....

195b   – 9 –

Question 3 (continued)

Use the following information to answer part (b).

The graph shows IND-TECH's past and predicted annual local production costs.

Production costs

IND-TECH's predicted annual overseas production costs are shown in the table.

Year	2009	2010	2011	2012	2013	2014	2015	2016
Production costs ($ million)	10.0	8.5	8.0	6.0	6.5	7.0	7.5	7.8

Question 3 continues on page 11

Question 3 (continued)

(b) (i) Graph the predicted annual overseas production costs on the grid on the previous page. **2**

(ii) When should overseas production costs match local production costs? **1**

....

....

(iii) Describe the trends in the graphs for local and overseas production costs. **4**

....

....

....

....

....

....

....

....

....

(iv) Outline factors IND-TECH would need to consider when estimating predicted production costs. **4**

....

....

....

....

....

....

....

....

....

....

Question 3 (continued)

(c)   IND-TECH intends to produce an operations manual for the overseas facility   **7**
      using a combination of text, graphics, photographs and charts.

      Explain how the different forms of presenting the information would support the
      purpose of the operations manual.

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

End of Question 3

Industrial Technology
Metals and Engineering Industries

Centre Number

Student Number
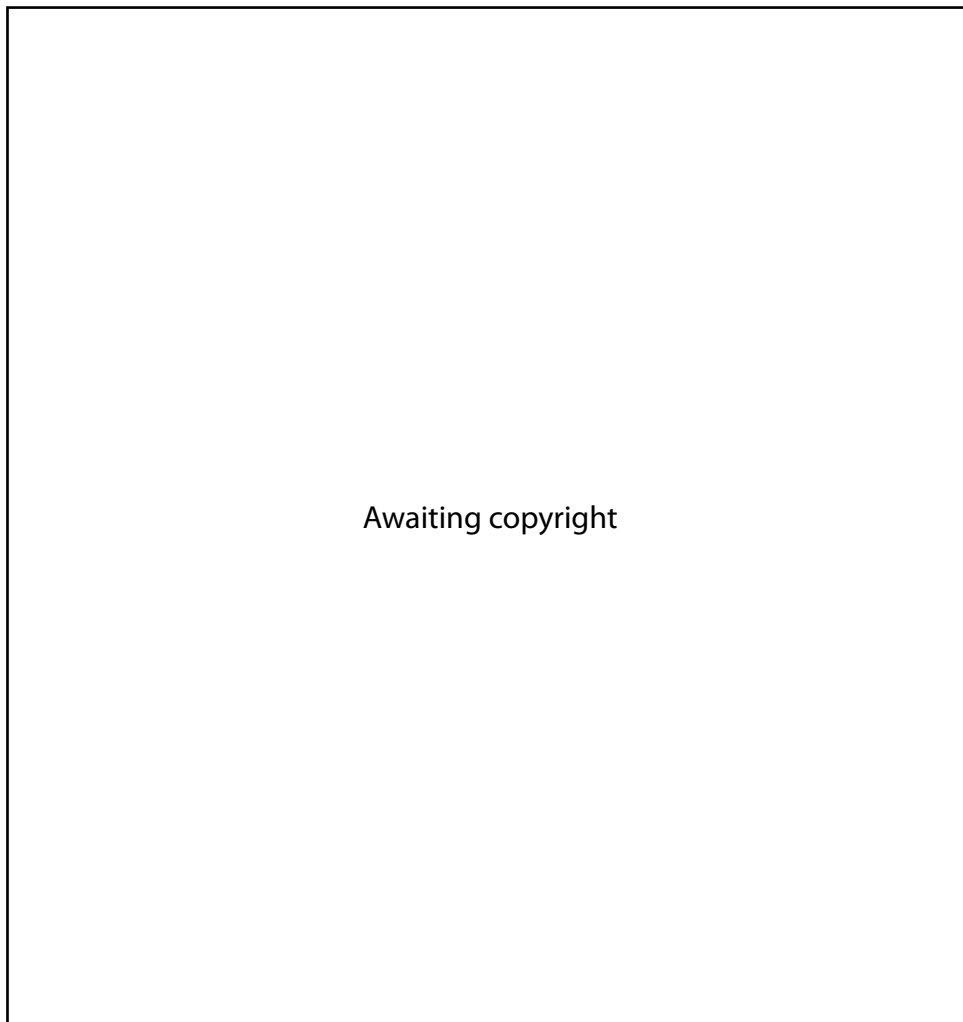
Section II

40 marks
Attempt Questions 4–5
Allow about 35 minutes for this section

Answer the questions in the spaces provided.

Question 4 (20 marks)

IND-TECH intends to manufacture a shelving unit as shown.

Awaiting copyright

Question 4 (continued)

(a)   The tube steel is described as $\varnothing 30 \times 2$.

2

What is the wall thickness of the steel and its inside diameter?

....

....

....

(b)   Describe a method of producing pairs of identical scrolls.

3

....

....

....

....

....

....

(c)   Two identical end caps, as shown in the diagram, are to be machined from brass. How would the end caps be manufactured? In your answer, name the tools involved.
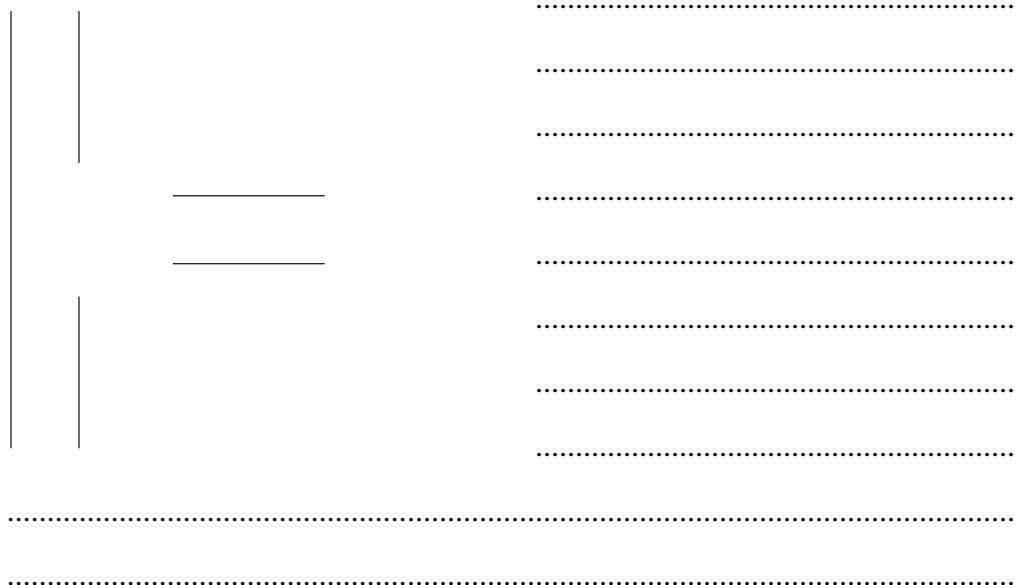
4

....

....

....

....

....

....

....

....

....

....

– 14 –
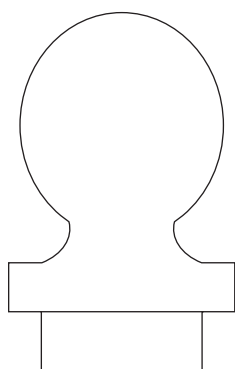
Question 4 (continued)

(d)   Describe, with the aid of a sketch, a suitable way of preparing two pieces of $\varnothing 30 \times 2$ mild steel tube prior to welding them at right angles.

4

....

....

....

....

....

....

....

....

....

....

– 15 –

Question 4 (continued)

(e) Describe, with the aid of sketches, a suitable method of attaching the timber   **7**
     shelf, the brass end caps and the scrolls to the frame.

Timber Shelf

....

....

....

....

....

....

Brass End Cap

....

....

....

....

....

....

Scroll

....

....

....

....

....

....

End of Question 4

Centre Number

Student Number

Section II (continued)

Question 5 (20 marks)

Use the diagram and information below to answer parts (a)–(e).

Awaiting copyright
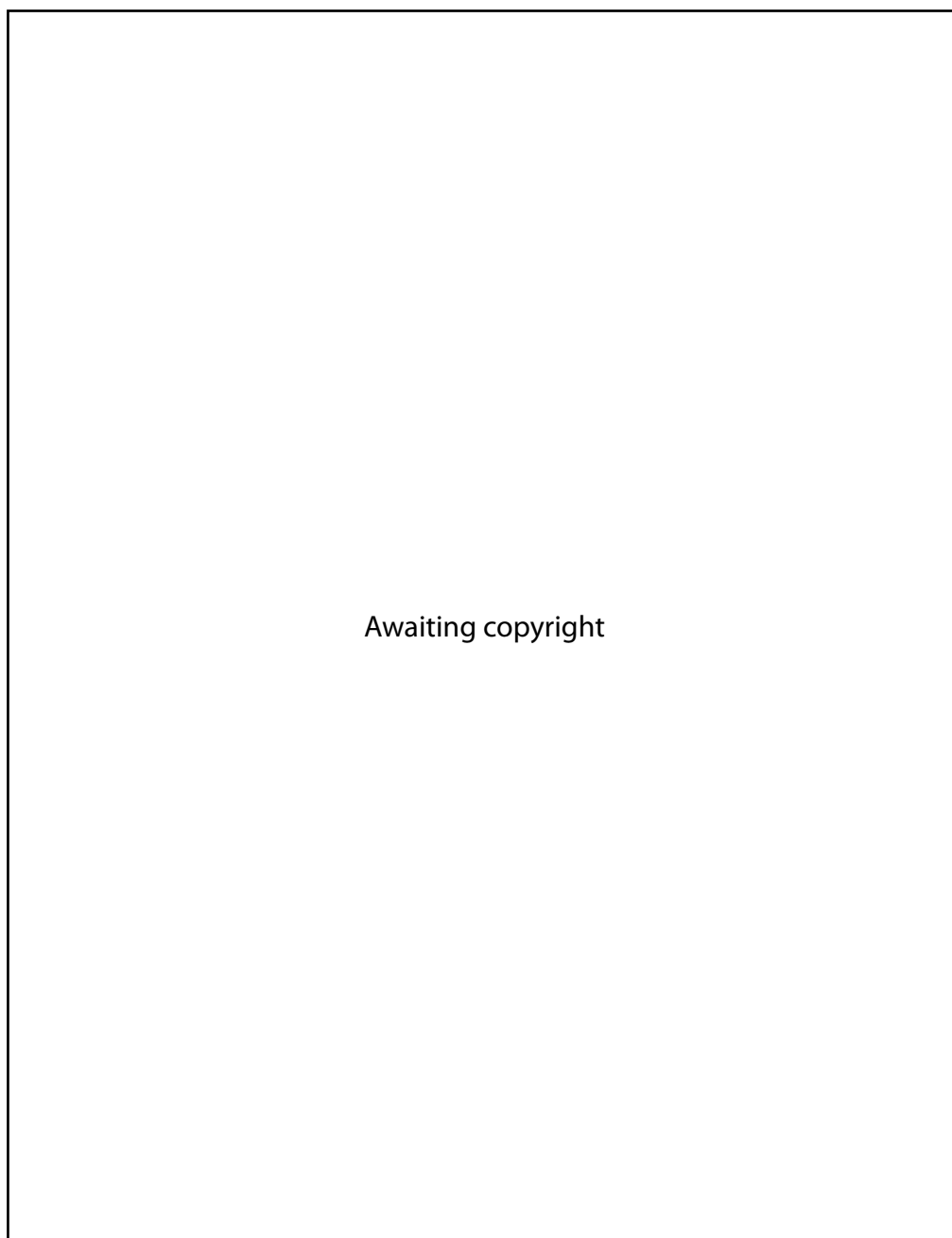
Question 5 (continued)

A ball pein hammer, as shown on page 17, is to be produced by IND-TECH.

(a) List TWO suitable materials from which the hammer head can be made.   **2**

....

....

....

....

(b) Name and describe a suitable method for fixing the shaft to the handle.   **3**

....

....

....

....

....

....

....

(c) Describe the process of cutting the 7.5° taper on the handle. In your answer, identify the adjustments that must be made to the lathe.   **4**

....

....

....

....

....

....

....

....

Question 5 (continued)

(d) The head of the hammer is modified to prevent damage when in use.   **4**

Recommend a suitable industrial process that could be applied.

....

....

....

....

....

....

....

....

Question 5 (continued)

(e)   IND-TECH intends to mass produce a ball pein hammer similar to the one   **7**
      shown on page 17.

      Evaluate a range of materials and industrial processes that could be used.

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

      ....

End of paper