



STUDENT NUMBER

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CENTRE NUMBER

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HIGHER SCHOOL CERTIFICATE EXAMINATION

1999

# INDUSTRIAL TECHNOLOGY

2 UNIT

## SECTION II BUILDING AND CONSTRUCTION INDUSTRIES

*Total time allowed for Sections I and II—One hour and a half  
(Plus 5 minutes reading time)*

### DIRECTIONS TO CANDIDATES

- Write your Student Number and Centre Number at the top right-hand corner of this page.
- Where appropriate, show all working for solutions neatly and clearly.
- You may use Board-approved drawing instruments and calculators.

### Section II—Building and Construction (15 marks)

- Question 4 is COMPULSORY.
- Attempt TWO questions from Questions 5, 6 and 7.
- Answer the questions in the spaces provided in this paper.

### MARKER'S USE ONLY

Question				
4				
5				
6				
7				

## SECTION II—BUILDING AND CONSTRUCTION

(15 Marks)

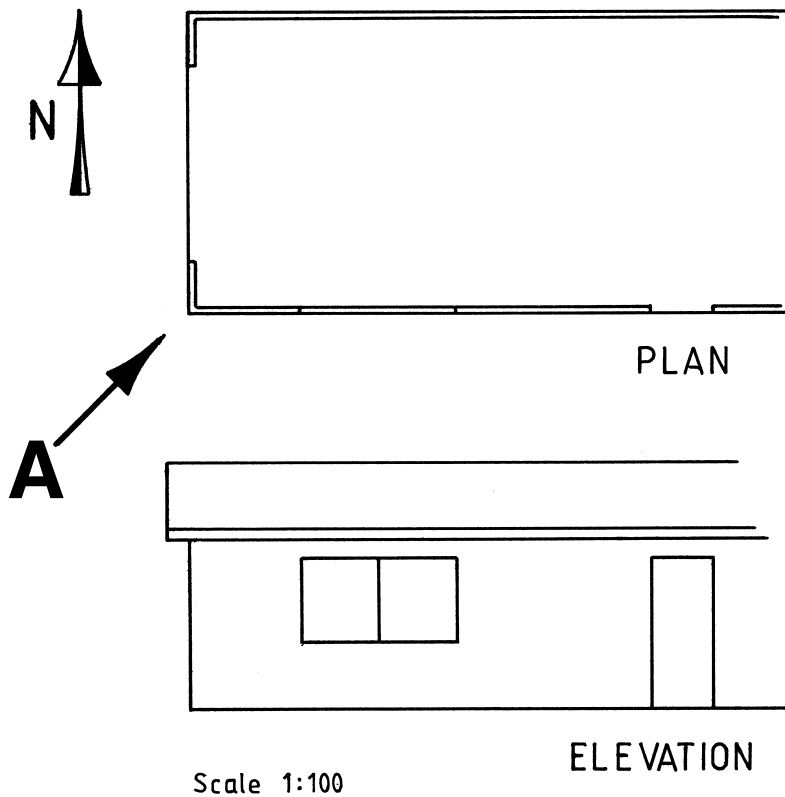
**QUESTION 4** This question is **COMPULSORY**. (5 marks)

An existing single garage is to have a workshop added to it. The specifications for the building work are as follows.

Workshop details:

- timber frame construction on a reinforced concrete slab added to the eastern end of the existing garage with a continuation of the trussed roof;
- same width and height as the existing garage;
- 4000 mm in length;
- a 2400 mm × 1200 mm window fitted in the centre of the new eastern wall. The window has a sill height of 1000 mm;
- existing eastern wall of garage removed.

(a) Complete the plan and elevation below by sketching the proposed additional workshop.



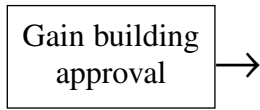
## QUESTION 4 (Continued)

- (b) In the space below, make a pictorial sketch of the modified garage/workshop when viewed from the arrow **A** shown in part (a).

Include representation of the strip wall-cladding and corrugated roofing.

## QUESTION 4 (Continued)

- (c) In the space below, complete the flowchart to show the key steps in the completion of the project.



Paint  
surfaces and  
trimming

## QUESTION 4 (Continued)

- (d) (i) Roof trusses are to be ordered. List FOUR details that must be specified to allow the manufacturer to design and supply the correct number of appropriate trusses.

1 ..... 2 .....  
3 ..... 4 .....

- (ii) Suggest TWO advantages of using trusses over cutting a roof frame on site.

Advantage 1 .....

Advantage 2 .....

- (iii) Name and describe the function of TWO metal fixings, other than screws and nails, that are used when fitting roof trusses.

Fixing 1 Name .....

Function .....

.....

Fixing 2 Name .....

Function .....

.....

- (e) TWO alternatives for strip wall-cladding include:

- vinyl siding that covers 300 mm and is available in 3·6 m lengths at \$37 per length;
- fibrous cement (Hardiplank) that covers 230 mm and is available in 4·8 m lengths at \$32 per length.

Calculate the cost per square metre of each material.

- (i) Vinyl siding

\$ ..... /m<sup>2</sup>

- (ii) Fibrous cement

\$ ..... /m<sup>2</sup>

Attempt TWO questions from Questions 5, 6 and 7.

**QUESTION 5** (5 marks)

- (a) When constructing a house on a concrete slab, it is important to plan all aspects of the construction.

- (i) Briefly explain what tasks must be completed by the plumber before the slab is cast.

.....  
 .....

- (ii) The plumber will return on at least two other occasions during construction. Describe the stage of construction and briefly explain the plumber's role on each of these occasions.

1 Stage of construction .....

Plumber's role .....

.....

2 Stage of construction .....

Plumber's role .....

.....

- (iii) State another *service* that may be included in the concrete slab.

.....

- (b) Concrete floors are used extensively in all forms of building.

- (i) Briefly describe the key features of a slab on the ground.

.....  
 .....  
 .....

- (ii) Describe an extra feature that must be included in the floor slab if it needs to support an internal load-bearing wall.

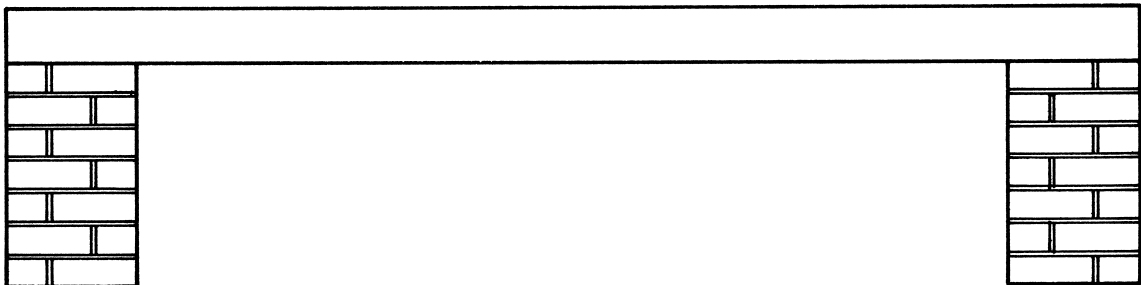
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## QUESTION 5 (Continued)

(iii) State the function of the following when used in a slab on the ground.

- 1 Plastic sheeting .....
- .....
- 2 Reinforcing mesh .....
- .....
- 3 Plastic chair .....
- .....
- 4 Trench mesh .....
- .....
- 5 Stirrup .....
- .....

(iv) On the cross-section of the suspended slab given below, draw a line to indicate the correct position of a single layer of reinforcing mesh.



(v) Fabric reinforcing is classified using a combination of letters and numbers. What does the classification F 72 mean?

- F .....
- 7 .....
- 2 .....

(vi) State ONE advantage and ONE disadvantage of using concrete floors in high-rise buildings.

Advantage .....

Disadvantage .....

## QUESTION 5 (Continued)

- (c) The walls of buildings may be clad in a variety of different materials.

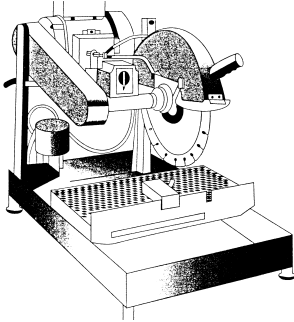
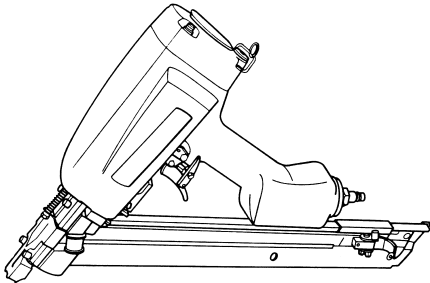
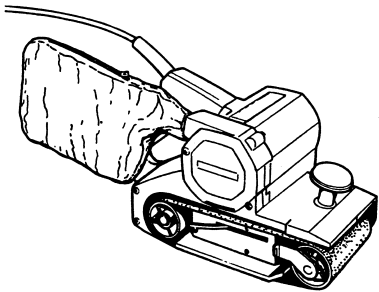
For each of the wall types listed below, state a typical application. Give ONE advantage and ONE disadvantage for each. (Do NOT repeat an answer.)

- (i) Precast concrete slabs .....  
 Advantage .....  
 Disadvantage .....
- (ii) Corrugated sheet steel .....  
 Advantage .....  
 Disadvantage .....
- (iii) Vinyl boards .....  
 Advantage .....  
 Disadvantage .....



**QUESTION 6** (5 marks)

- (a) Complete the table below. Name the tool pictured, identify a common use and state ONE precaution that should be taken when using the tool.

<i>Tool</i>	<i>Name</i>	<i>Common use</i>	<i>Precaution</i>
			
			
			

- (b) When designing low-cost housing, a decision is made to use sheet-metal roofing in preference to concrete tiles. Ignoring the purchase cost of materials, give TWO reasons why sheet-metal roofing is more suitable for reducing overall building costs.

Reason 1 .....

.....

Reason 2 .....

.....

**Question 6 continues on page 10**

## QUESTION 6 (Continued)

- (c) Explain how the design layout of a home can reduce the cost of plumbing and drainage.

.....

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.....

.....

- (d) Residential housing style often varies with location.

State a common style that is used in each of the following situations. (Do NOT repeat the style.) Give ONE reason why the style stated is suitable in each situation.

*Inner city*                      Style: .....

Reason .....

.....

*Large rural town*              Style: .....

Reason .....

.....

- (e) Outline TWO building codes associated with civic or public buildings that do not apply to residential buildings.

Code 1 .....

.....

.....

Code 2 .....

.....

.....

## QUESTION 6 (Continued)

(f) A variety of surface coatings are used in building construction.

(i) Suggest TWO reasons for applying paint to a surface.

1 .....

2 .....

(ii) Briefly explain the role of primer when finishing materials.

.....

.....

.....

(iii) Describe a coating that should be used in a shower recess before tiling occurs.

.....

.....

.....

**Please turn over**

**QUESTION 7** (5 marks)

- (a) Concern for natural resources has resulted in changes in materials used for some building components.

Discuss this statement, using ONE example to support your answer.

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- (b) Safety is a vital consideration of any building construction process.

- (i) Suggest THREE safety devices that should be used during the construction of a multi-storey building.

1 .....

2 .....

3 .....

- (ii) State TWO safety devices that must be installed in all new residential buildings.

Device 1 .....

Device 2 .....

## QUESTION 7 (Continued)

- (c) Concrete, strip timber, and sheet-timber products are all used as flooring in houses.

State ONE advantage and ONE disadvantage of each type of flooring. (Do NOT repeat an answer.)

*Concrete*

Advantage .....

.....

Disadvantage .....

.....

*Strip timber*

Advantage .....

.....

Disadvantage .....

.....

*Sheet-timber product*

Advantage .....

.....

Disadvantage .....

.....

- (d) State the most suitable flooring material that could be fixed to timber joists in a first floor bathroom. Briefly explain why it is suitable.

Material .....

Reason .....

- (e) Briefly explain a difference between floor joists used in the ground floor and those used in the first floor of a building.

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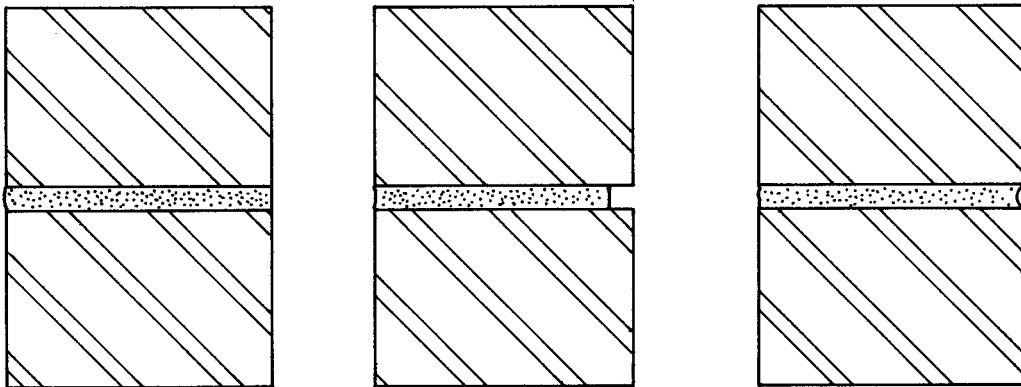
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## QUESTION 7 (Continued)

(f) Briefly define each of the terms listed below as they relate to bricklaying.

- (i) Wall tie .....
- .....
- (ii) Cavity .....
- .....
- (iii) Mortar .....
- .....
- (iv) Lintel/arch bar .....
- .....
- (v) Perpend .....
- .....

(g) Name each of the brick-finishing joints shown in the cross-sectional diagrams below.



Name of joint:..... Name of joint:..... Name of joint:.....

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