



# basic education

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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**CIVIL TECHNOLOGY: WOODWORKING**

**EXEMPLAR 2018**

**MARKS: 200**

**TIME: 3 hours**

**This question paper consists of 16 pages and 7 answer sheets.**

**REQUIREMENTS:**

1. Drawing instruments
2. A non-programmable calculator
3. ANSWER BOOK

**INSTRUCTIONS AND INFORMATION**

1. This question paper consists of SIX questions: TWO questions are generic and FOUR questions are subject specific.
2. Answer ALL the questions.
3. Answer each question as a whole. Do NOT separate subsections of questions.
4. Start the answer to EACH question on a NEW page.
5. Do NOT write in the margins of the ANSWER BOOK.
6. You may use sketches to illustrate your answers.
7. Write ALL calculations and answers in the ANSWER BOOK or on the attached ANSWER SHEETS.
8. Use the mark allocation as a guide to the length of your answer.
9. Make drawings and sketches in pencil, fully dimensioned and neatly finished off with descriptive titles and notes to conform to the *SANS/SABS Code of Practice for Building Drawings*.
10. For the purpose of this question paper, the size of a brick should be taken as 220 mm x 110 mm x 75 mm.
11. Use your own discretion where dimensions and/or details have been omitted.
12. Answer QUESTIONS 2.1, 2.2, 3.1, 3.2, 5.6 and 6.10 on the attached ANSWER SHEETS using drawing instruments where necessary.
13. Write your CENTRE NUMBER and EXAMINATION NUMBER on every ANSWER SHEET and hand them in with your ANSWER BOOK, whether you have used them or not.
14. Due to electronic transfer, drawings in the question paper are NOT to scale.
15. Google Images was used as source for all photographs and pictures.

**QUESTION 1: OHSA, MATERIALS, TOOLS, EQUIPMENT AND JOINING (GENERIC)**

Start this question on a NEW page.

- 1.1 Choose a description from COLUMN B that matches an item in COLUMN A. Write only the letter (A–L) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, e.g. 1.1.11 M.

COLUMN A		COLUMN B	
1.1.1	Curing	A	used by only one person at a time
1.1.2	Ladder	B	corrosion proof
1.1.3	Builder's hoist	C	applied to the base metal – makes the metal corrosion resistant
1.1.4	Zinc coating	D	temporary structure that allows workmen to work comfortably above chest height
1.1.5	Scaffold	E	quick method of transferring tools and equipment between floors
1.1.6	Chute	F	metal dipped in molten zinc
1.1.7	Electroplating	G	can be applied with a brush
1.1.8	Paint	H	process of keeping freshly cast concrete moist for a specific period
1.1.9	Aluminium	I	process of coating a metal with a thin layer of another metal by electrolysis
1.1.10	Galvanised	J	quick method of sending rubble and debris to ground floor
		K	can be applied in powder form
		L	prevent splashing of chemicals

(10 x 1)

(10)

1.2 FIGURE 1.2 below shows a surveying tool used on a construction site

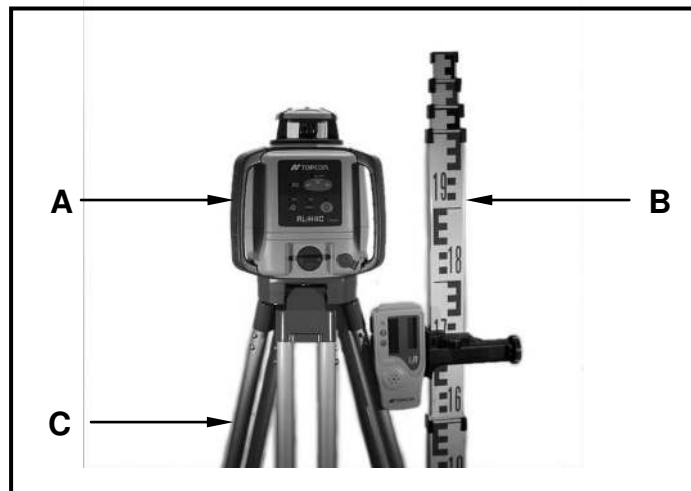


FIGURE 1.2

1.2.1 Identify parts **A–C**. (3)

1.2.2 Explain how will you take care of part **A**. (1)

1.3 FIGURE 1.3 below shows a scaffold with a working platform.

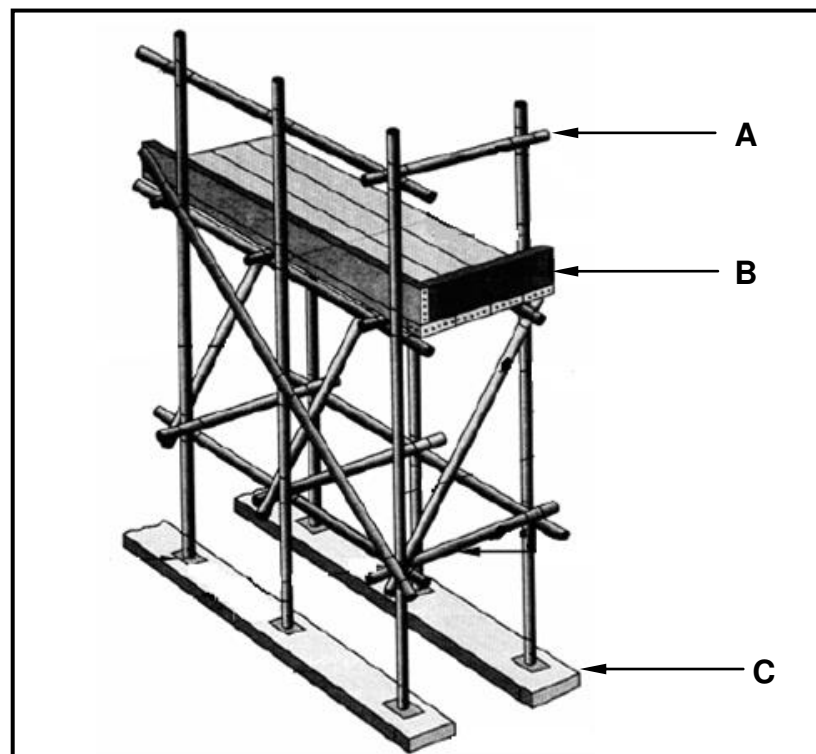
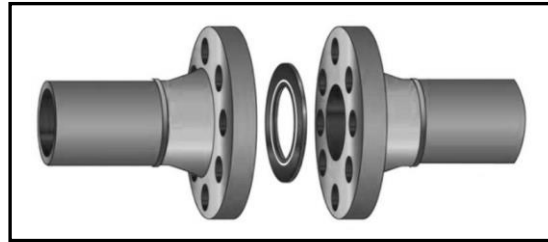


FIGURE 1.3

1.3.1 Describe TWO safety precautions that you will take when working on a scaffold. (2)

1.3.2 Explain the purpose of part **A** in terms of safety. (1)

- 1.3.3 What safety feature does **B** provide? (1)
- 1.3.4 Explain what will happen if part **C** is omitted when workers are working on the platform. (1)
- 1.4 FIGURE 1.4 below shows two pipes with flanges. Recommend a suitable fastener to join the two flanges.



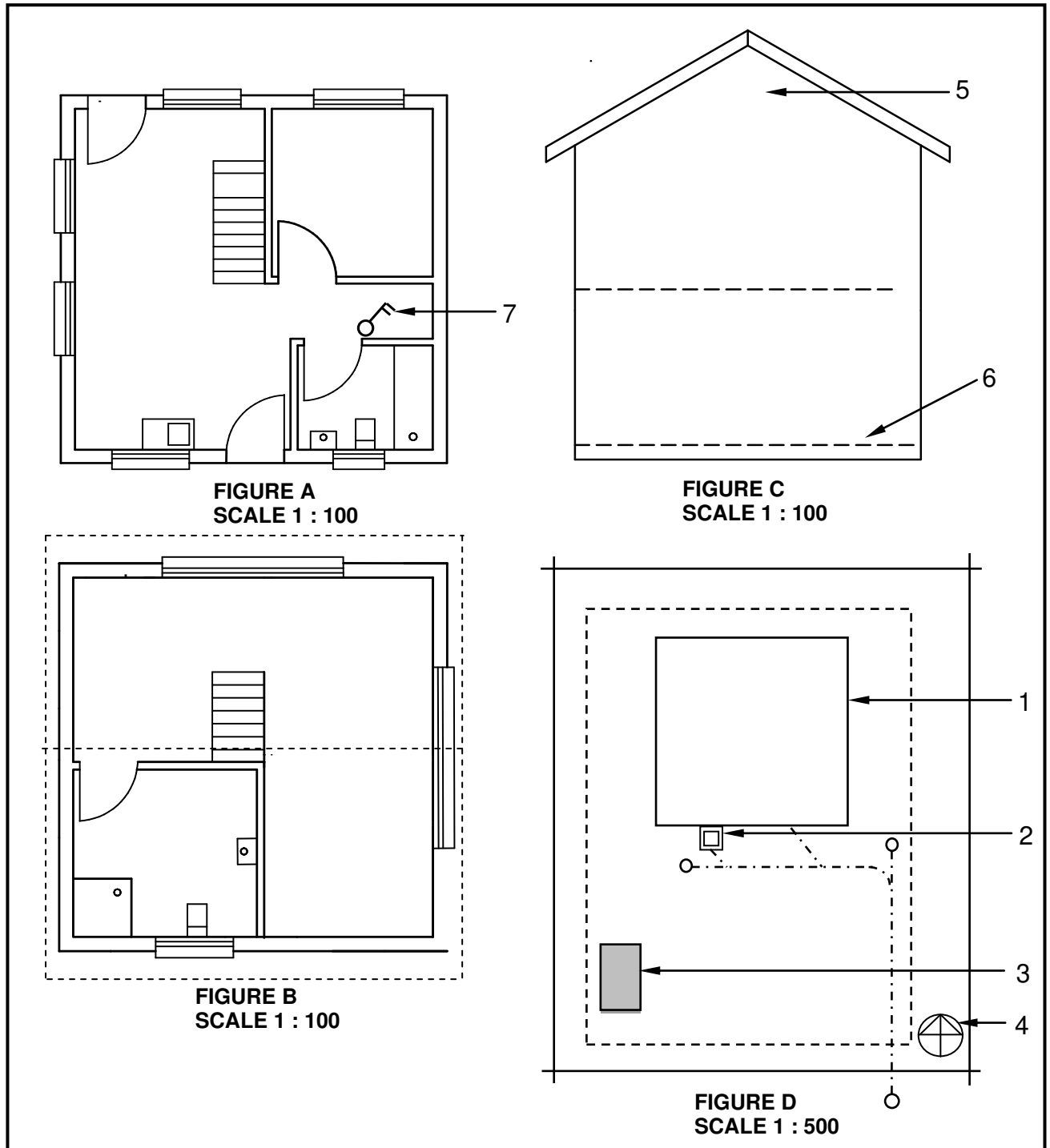
**FIGURE 1.4**

(1)  
**[20]**

**QUESTION 2: GRAPHICS AS METHOD OF COMMUNICATION (GENERIC)**

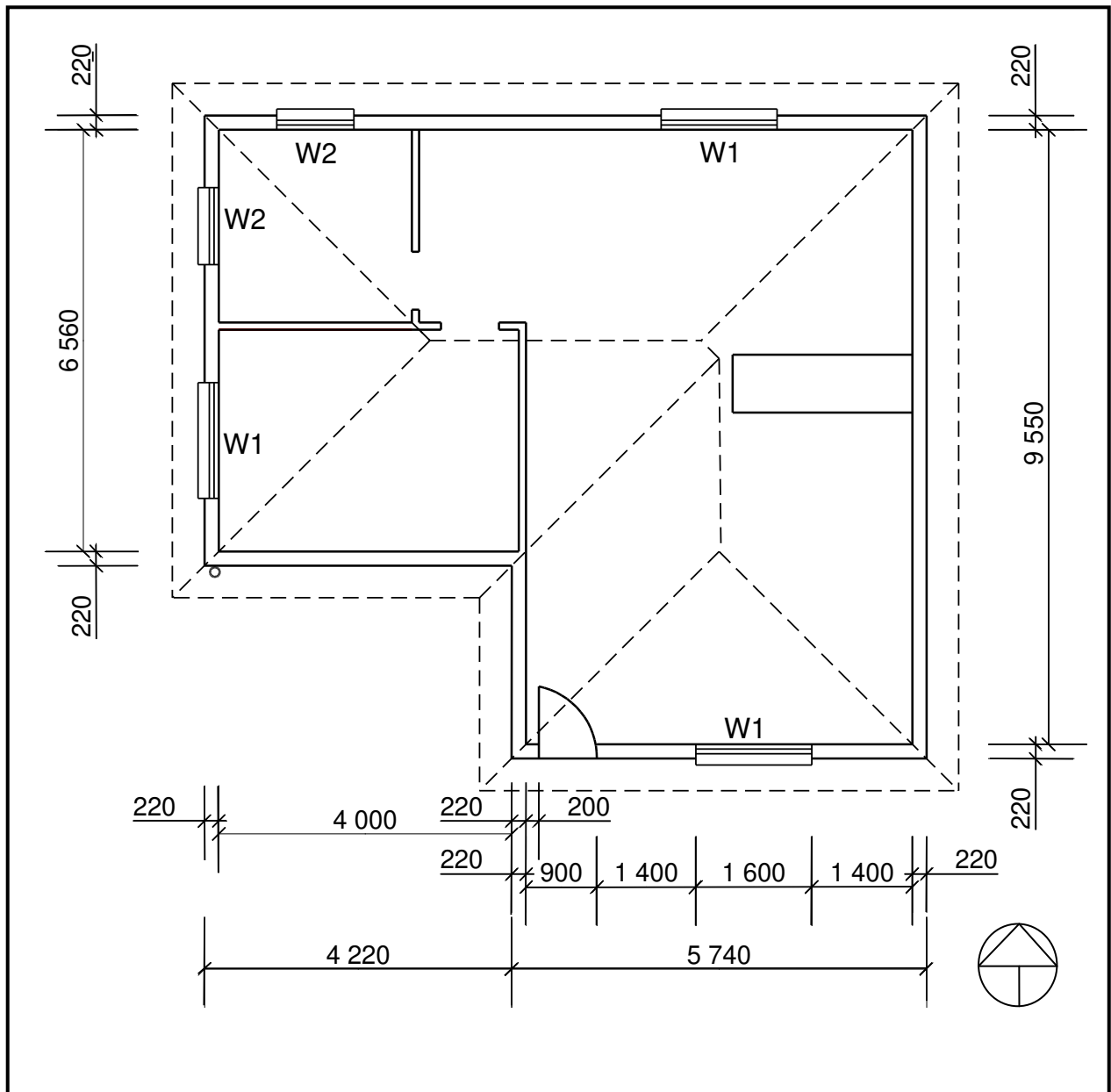
Start this question on a NEW page.

2.1 FIGURE 2.1 below shows different drawings that appear on a building plan. Analyse the drawings and complete the table on ANSWER SHEET 2.1.



**FIGURE 2.1**

2.2 FIGURE 2.2 below shows an incomplete floor plan of a proposed dwelling.



**FIGURE 2.2**

Study FIGURE 2.2 and develop and draw, on ANSWER SHEET 2.2, to scale 1 : 50, the SOUTH ELEVATION of the building. Use the following specifications. (Use the assessment criteria on ANSWER SHEET 2.2 as a guideline for your drawing.)

**SPECIFICATIONS:**

- The height between the natural ground level and the top level of the floor slab is 500 mm.
- The height between the floor slab and the underside of the wall plate is 2 600 mm.
- The roof is covered with corrugated galvanised sheeting and is finished with 220 mm wide fascia boards.
- Ridge capping is 100 mm high.

- Rainwater downpipes are 75 mm in diameter and 100 mm square gutters are used.
- A rainwater downpipe should be placed at the corner of the building, as indicated on the floor plan.
- The eaves overhang is 500 mm.
- The door opening is 2 100 mm high and 900 mm wide.
- The door step is 250 mm high.
- The building has a gable roof with a pitch of 30°.

The following must also be shown on the drawing:

- The method used to determine the roof height
- Window sills
- ONE rainwater downpipe

Windows and doors:

<b>WINDOWS AND DOORS</b>	<b>WIDTH</b>	<b>HEIGHT</b>
Window 1 (W1)	1 600	1 200
Door openings 1 (D1)	900	2 100

THREE marks will be allocated for the application of the scale.

Start the drawing from corner **A**, as indicated in the bottom left-hand corner of ANSWER SHEET 2.2.

(25)  
[40]



**QUESTION 3: CASEMENTS, DOORS, WALLPANELLING AND CUPBOARDS  
(SPECIFIC)**

Start this question on a NEW page.

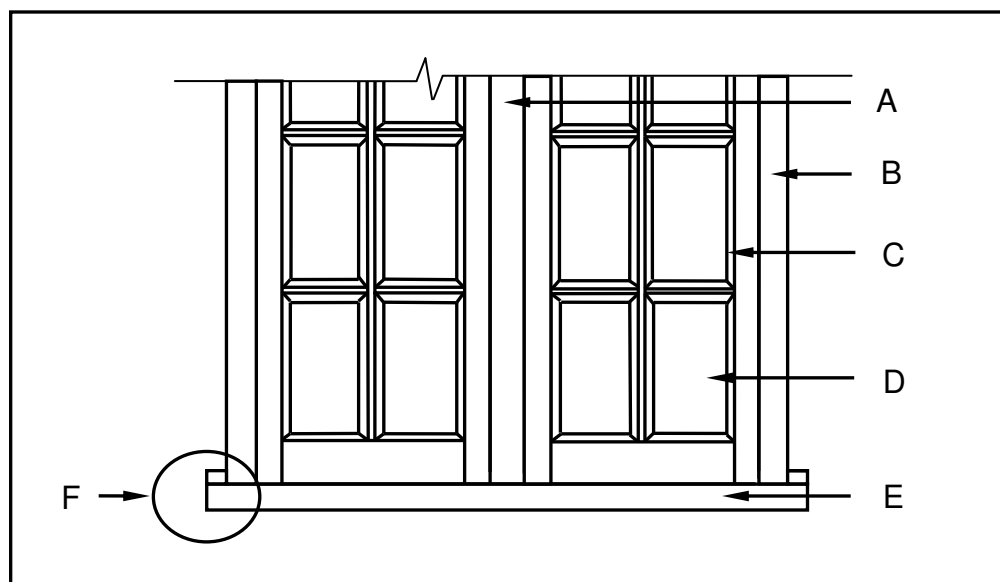
3.1 Answer the following questions regarding a double casement window with fanlights.

3.1.1 Write down the definition of a *transom*. (4)

3.1.2 What is the purpose of a glazing bar? (1)

3.2 FIGURE 3.2 below is a sketch of part of an external elevation of a double casement window with fanlights. Study the sketch and answer the questions that follow.

3.2



**FIGURE 3.2**

3.2.1 What is the purpose of the fanlights? (1)

3.2.2 Identify parts **A** to **E**. (5)

3.2.3 Describe the purpose of **F**. (1)

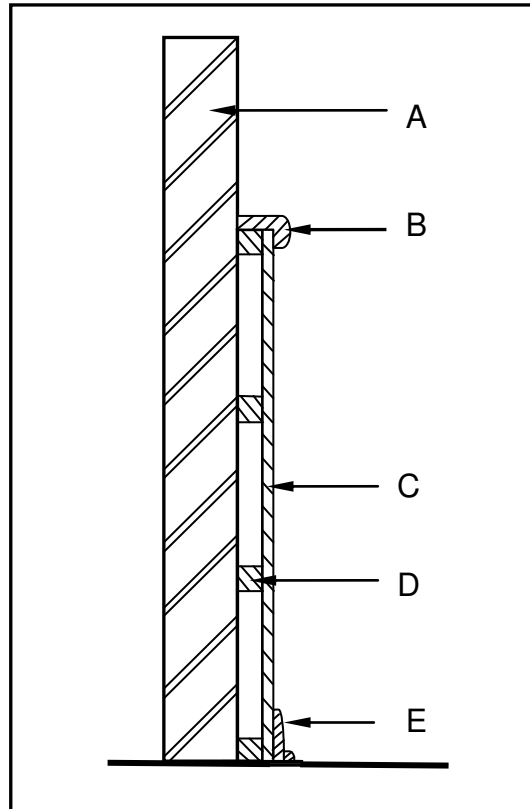
3.2.4 Name the electrical tool you would use to cut a profile on **C**. (1)

3.2.5 Name the fitting that is used to attach the casement to its frame. (1)

3.3 FIGURE 3.3 on ANSWER SHEET 3.3 shows a four-panel door with raised panels. Use ANSWER SHEET 3.3 and draw, in good proportion, a labelled sketch of a horizontal section through the stile and raised panel of a door showing how the panel is joined to the door by means of a tongue and groove joint. Complete the sectional view showing the tongue and groove joint as well as the raised panel. (8)

3.4 FIGURE 3.4 below is a sketch of the vertical section through a strip of board wall panelling. Identify members **A** to **E**. Write the name of the part next to the

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letter (A–E) in the ANSWER BOOK.



**FIGURE 3.4**

(5)

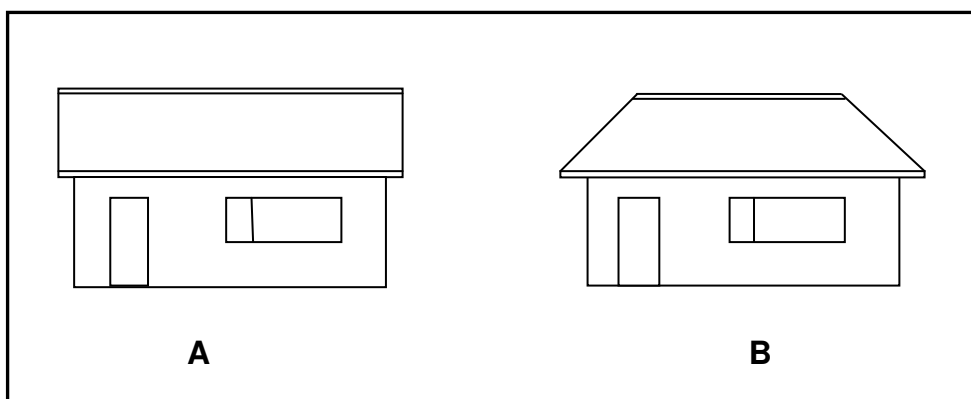
- 3.5 Differentiate between *built-in cupboards* and *free-standing cupboards*. (2)
- 3.6 Explain the advantage of using an oval-shaped rail as a hanger rail inside a cupboard. (1)

**[30]**

**QUESTION 4: ROOFS AND CEILINGS (SPECIFIC)**

Start this question on a NEW page.

- 4.1 Compare, by means of TWO sketches, the profiles of a *roofing batten* and a *purlin*. Show the width and thickness of the batten and purlin in millimetres. (4)
- 4.2 Differentiate between an *open eave* and a *closed eave* by means of TWO line sketches. Label EACH sketch. (4)
- 4.3 FIGURE 4.3 below shows roof profiles for building **A** and building **B**. Study the sketch and answer the questions that follow.



**FIGURE 4.3**

- 4.3.1 Name the roof profiles of building **A** and building **B**. (2)
- 4.3.2 Explain why the cost of installing the roof for building **B** will be more expensive than for building **A**. (1)
- 4.3.3 Draw a neat line sketch of the top view of the roof of building **B**. (4)
- 4.3.4 Name ONE requirement that a roof truss should meet in terms of its design and construction. (1)
- 4.4 Name TWO materials that can be used as roof coverings for thatched roofs. (2)
- 4.5 Explain the purpose of the following:
- 4.5.1 Truss hangers (1)
- 4.5.2 Storm clips (1)
- 4.6 Explain the purpose of a trap door in a ceiling. (1)
- 4.7 Name ONE method of installing trap doors to ceilings. (1)
- 4.8 What should be the maximum distance between ceiling battens (branderings)? (1)

4.9 Use ANSWER SHEET 4.9 and calculate the number of roof tiles needed for a lean-to roof with the following specifications. Round off the answers to TWO decimals.

- The length of roof is 9 700 mm
- The width of the roof is 3 650 mm
- The area of one roof tile is 0,123 m<sup>2</sup>

(7)

4.10 FIGURE 4.10 on ANSWER SHEET 4.10 is a drawing, according to scale 1 : 10, of two supporting walls for a close couple roof truss. Complete the drawing using the following specifications:

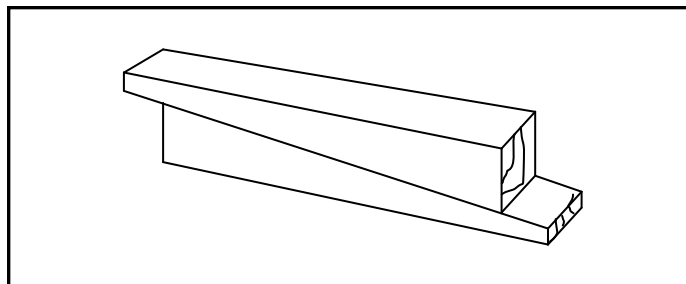
- Wall plate: 114 x 38 mm
- Tie beam and rafters: 114 x 38 mm
- Eaves overhang: 300 mm
- Pitch: 30°

(10)  
**[40]**

**QUESTION 5: CENTERING, FORMWORK, SHORING AND IRONMONGERY (SPECIFIC)**

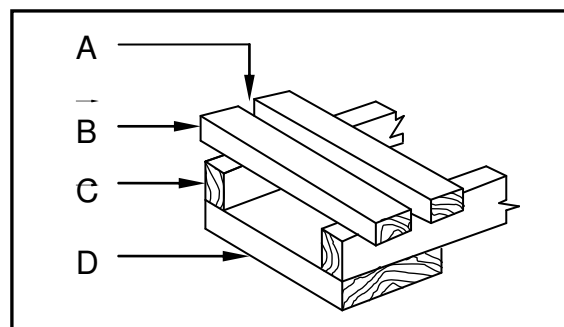
Start this question on a NEW page.

- 5.1 Describe TWO reasons why the templates of segmental and semi-circular arches are cut out of hardboard before the ribs can be marked to shape. (2)
- 5.2 FIGURE 5.2 below is a pictorial view of folding wedges used during the erection of centering. Study the sketch and answer the questions that follow.



**FIGURE 5.2**

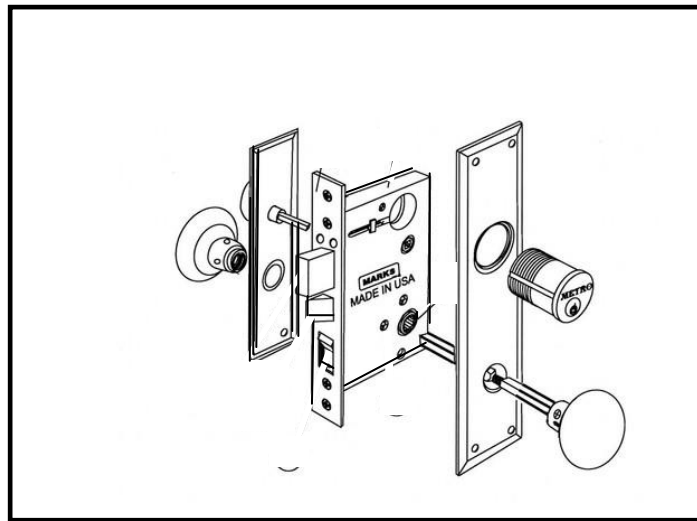
- 5.2.1 Describe THREE places where folding wedges are used during the erection of centres. (3)
- 5.2.2 Explain TWO purposes of wedges during the construction of centering. (2)
- 5.2.3 Name TWO electrical tools that you would use to cut folding wedges to size. (2)
- 5.3 FIGURE 5.3 below is a sketch of a part of a centre for a flat arch. Identify **A** to **D**. Write only the name next to the letter (A–D) in the ANSWER BOOK.



**FIGURE 5.3**

(4)

- 5.4 FIGURE 5.4 below is a sketch of a lock. Study the sketch and answer the questions that follow.



**FIGURE 5.4**

- 5.4.1 Identify the lock. (1)
- 5.4.2 Identify the part of the door into which the lock will be fitted. (1)
- 5.4.3 Name an entrance door where this lock cannot be fitted (1)
- 5.4.4 Name the part of the lock that must be fitted onto the frame of the door. (1)
- 5.5 Name THREE materials that can be used on the inner face of formwork as a lining so that a smoother concrete finish can be obtained. (3)
- 5.6 The drawing on ANSWER SHEET 5.6 is a 500 mm square concrete column drawn to scale 1 : 10. Use ANSWER SHEET 5.6 and draw the formwork around the column showing ALL necessary support.

Specifications:

Shutter board: 22 mm

Yokes and cleats: 70 mm x 50 mm

Threaded rods with washer and nuts: 20 mm diameter

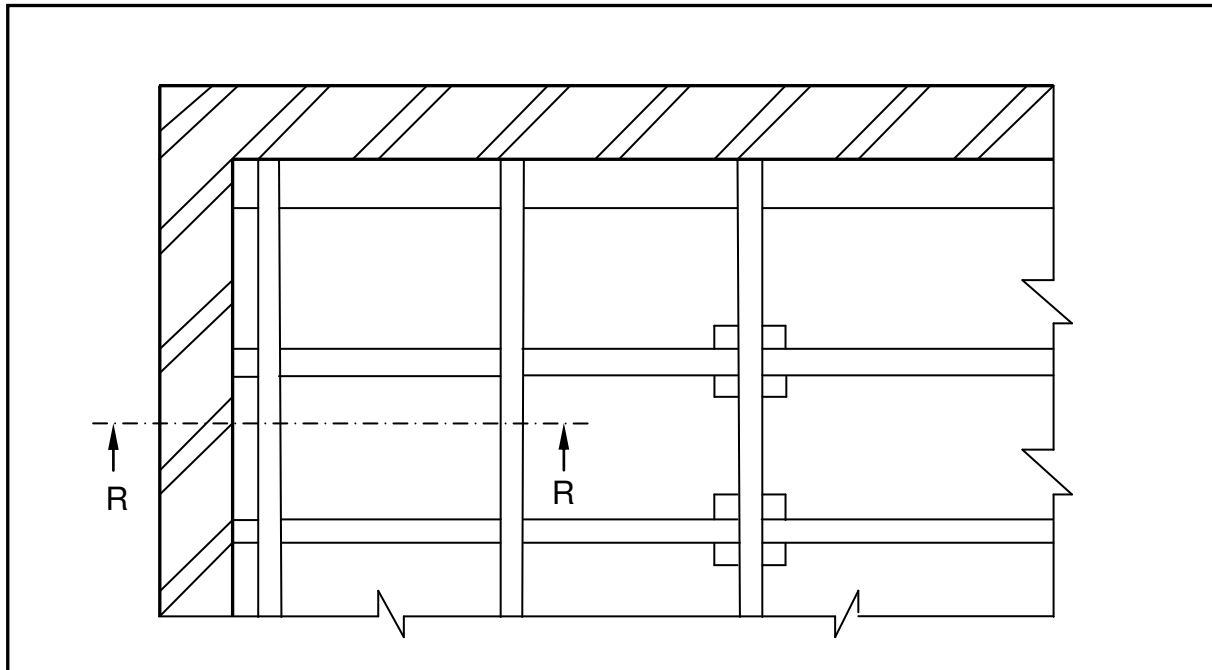
(10)  
[30]

**QUESTION 6: SUSPENDED FLOORS AND STAIRCASES (SPECIFIC)**

Start this question on a NEW page.

- 6.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (6.1.1 to 6.1.6) in the ANSWER BOOK, e.g. 6.1.6 C.
- 6.1.1 Access to the hollow area under a suspended timber floor is created so that...  
A surplus material can be stored in there.  
B family pets can sleep in it.  
C regular inspection of the construction and materials can be done.  
D the ant guard does not rust. (1)
- 6.1.2 In a suspended timber floor the floor boards ...  
A run parallel to the floor joists.  
B run next to the bearers.  
C cross the floor joists at ninety degrees.  
D cross the bearers at ninety degrees. (1)
- 6.1.3 In a timber staircase the newel post is found ...  
A at the foot of the staircase.  
B above the handrail.  
C under the handrail.  
D next to the central bearer. (1)
- 6.1.4 The rise in a timber staircase is the vertical ...  
A board between two consecutive treads.  
B distance between two consecutive treads.  
C board between two balusters.  
D distance between two balusters. (1)
- 6.1.5 The baluster in a timber staircase is ...  
A two vertical members.  
B one horizontal member.  
C found between two risers.  
D installed between the handrail and outer string. (1)
- 6.2 Explain TWO purposes of a handrail in staircase construction. (2)
- 6.3 Explain TWO purposes of a landing in staircase construction. (2)
- 6.4 Differentiate between *in-line strutting* and *staggered strutting* used for timber floor construction. (2)
- 6.5 Predict ONE consequence of not installing a skirting in a suspended timber floor. (1)

- 6.6 Draw TWO single-line diagrams to illustrate the difference between a left-sided staircase and a right-sided staircase with a half space landing. Clearly indicate, by means of arrows, the direction of movement on the flight. Print a title for each sketch. (8)
- 6.7 FIGURE 6.7 below is a drawing of a part of a suspended timber floor plan. Study the sketch and draw on ANSWER SHEET 6.7, to scale 1 : 10, a vertical cross section through cutting plane R-R.



**FIGURE 6.7**

Show the following in your drawing:

- 750 mm x 300 mm foundation
- 330 mm wide foundation wall
- 220 mm wide superstructure wall, internally plastered
- DPC
- Height to underside of DPC is 600 mm
- Galvanised ant guard
- Air brick
- 114 mm x 38 mm wall plate
- 225 mm x 75 mm bearer
- 150 mm x 50 mm floor joist
- 150 mm x 30 mm tongue and grooved floor boards
- 70 mm x 20 mm skirting board
- 20 mm quadrant

Label any TWO parts of the drawing.

(20)  
[40]

**TOTAL: 200**



<b>CENTRE NUMBER:</b>											
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<b>EXAMINATION NUMBER:</b>															
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**ANSWER SHEET 2.1**

<b>NO.</b>	<b>QUESTIONS</b>	<b>ANSWERS</b>	<b>MARKS</b>
1	Identify FIGURE A.		1
2	Identify FIGURE B.		1
3	Identify FIGURE D.		1
4	What do the short dashed lines in FIGURE B indicate?		1
5	What type of roof is used on this building?		1
6	Name the scale that was used to draw FIGURE B.		1
7	Name the scale that was used to draw FIGURE D.		1
8	On what side of the building is the bathrooms situated?		1
9	What is indicated by number 1?		1
10	What is indicated by number 2?		1
11	What is indicated by number 3?		1
12	What is indicated by number 4?		1
13	What is indicated by number 5?		1
14	What is indicated by number 6?		1
15	What is indicated by number 7?		1
		<b>TOTAL</b>	<b>15</b>

<b>CENTRE NUMBER:</b>																				
<b>EXAMINATION NUMBER:</b>																				

**ANSWER SHEET 2.2**

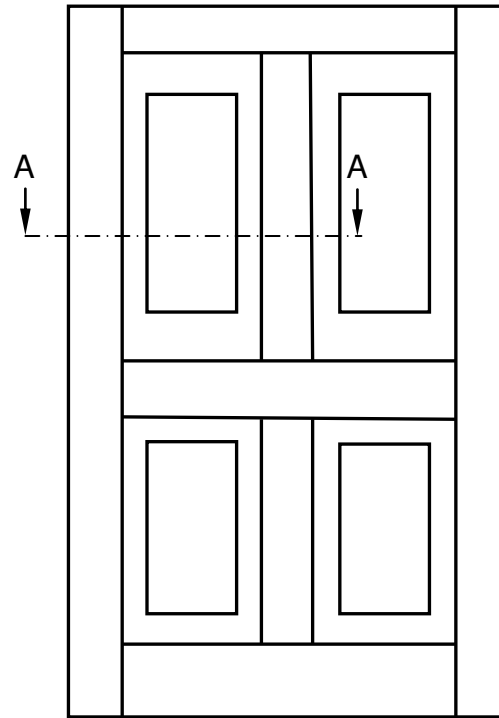
ASSESSMENT CRITERIA	MARKS	LM
External walls	3	
NGL (indicated correctly)	1	
FFL (indicated correctly)	1	
Window	1	
Window sill	1	
Door opening	1	
Step gable	1	
Fascia board	1	
Barge board	2	
Roof (correctly drawn)	3	
Gutter	1	
Rainwater downpipe	1	
Ridge capping	1	
Determining roof height	2	
Any two labels	2	
Application of scale One or two incorrect = 3 Three or four incorrect = 2 More than five incorrect = 1 No measurement correct = 0	3	
<b>TOTAL</b>	<b>25</b>	

A 

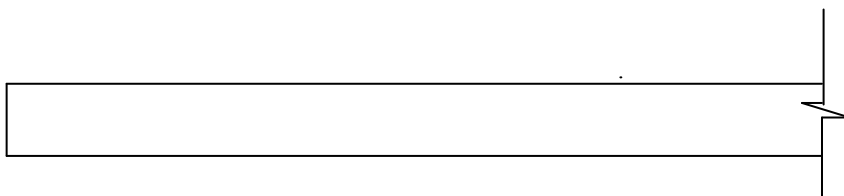
**CENTRE NUMBER:**

**EXAMINATION NUMBER:**

**ANSWER SHEET 3.3**



**FIGURE 3.3**



ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Tongue	3	
Groove	3	
Raised panel	2	
<b>TOTAL</b>	<b>8</b>	

CENTRE NUMBER: 

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EXAMINATION NUMBER: 

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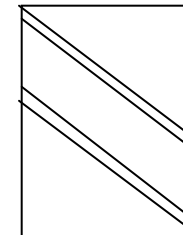
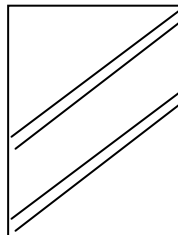
**ANSWER SHEET 4.9**

A	B	C	D
			<b>Length to be covered by tiles</b>
			Length of roof is 9 700 mm
			Width of roof is 3 650 mm
			<b>Area of roof to be tiled</b>
1/			Length of roof _____
	_____		Width of roof _____
		_____	= _____ m <sup>2</sup> roof covering needed
			<b>Number of roof tiles</b>
			<u>Area of roof</u> Area of tile
			= _____
			= _____ number of roof tiles needed

<b>CENTRE NUMBER:</b>															
<b>EXAMINATION NUMBER:</b>															

**ANSWER SHEET 4.10**

ASSESSMENT CRITERIA	MARK	LEARNER MARK
Wall plate	2	
Tie beam	1	
Rafters	2	
Eaves	2	
Door height	1	
Door width	1	
Scale	1	
<b>TOTAL</b>	<b>10</b>	





**CENTRE NUMBER:**

**EXAMINATION NUMBER:**

**ANSWER SHEET 6.7**

R 

ASSESSMENT CRITERIA	MARKS	LM
Foundation	1	
Foundation wall		
Wall superstructure		
Plaster		
NGL	1	
Bearer	1	
Ant guard	1	
DPC	1	
Floorboards	1	
Floor joists	1	
Quadrant	1	
Skirting	1	
Wall plate	1	
Airbrick	1	
Brick pier to support bearer	1	
Any TWO labels	2	
Application of scale		
One or two incorrect = 3		
Three or four incorrect = 2		
More than five incorrect = 1		
No measurement correct = 0	3	
<b>TOTAL</b>	<b>20</b>	