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Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

CIVIL TECHNOLOGY: WOODWORKING

NOVEMBER 2019

MARKS: 200

TIME: 3 hours

This question paper consists of 13 pages and 9 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.
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 answers.
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, 3.3, 3.4, 3.5, 4.9, 5.5, 5.7, 6.7 and 6.8 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. Drawings in the question paper are NOT to scale due to electronic transfer.
15. Google Images was used as the source of all photographs and pictures.

QUESTION 1: OHSA, SAFETY, 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–K) next to the question numbers (1.1.1 to 1.1.8) in the ANSWER BOOK, e.g. 1.1.9 L.

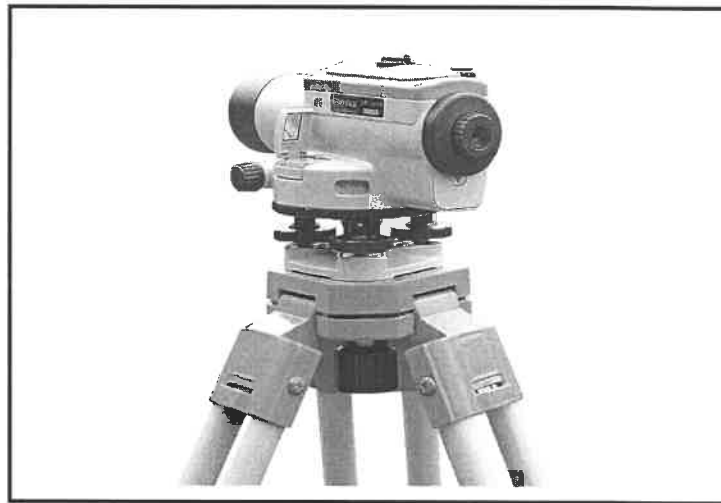
COLUMN A		COLUMN B	
1.1.1	PVA paint	A	method of finishing metal exposed to heavy wear and tear conditions
1.1.2	Guard rail	B	can be applied to walls
1.1.3	Powder coating	C	keeps rungs free from oil and grease
1.1.4	Builder's hoist	D	light material used in the manufacturing of door and window frames
1.1.5	Ladder	E	used as a means to dispose of waste material and debris from elevated areas in the fastest possible way
1.1.6	Diagonal brace	F	keeps scaffolds stable when erected
1.1.7	Galvanising	G	transports workers, materials and equipment between ground and upper levels
1.1.8	Chute	H	gates should always be kept shut when the device is being used
		I	prevents people from falling off the scaffolds
		J	zinc coating applied to the base of metal
		K	used to delay the drying time of paint

(8 x 1) (8)

- 1.2 Explain TWO advantages of electroplating. (2)

- 1.3 Name the process when freshly cast concrete is kept moist for a specific period of time. (1)

- 1.4 Explain the purpose of keeping freshly cast concrete moist for a certain period of time after the concrete has been cast. (1)
- 1.5 You are transporting material on a construction site from one place to another. Describe TWO safety precautions that you will adhere to while transporting the material. (2)
- 1.6 Describe ONE safety factor that must be considered when using scaffold planks to erect a scaffold platform. (1)
- 1.7 FIGURE 1.7 below shows a surveying tool used on a building site.

**FIGURE 1.7**

- 1.7.1 Identify the tool above. (1)
- 1.7.2 Predict ONE consequence if the instrument is NOT set level. (1)
- 1.8 FIGURE 1.8 below shows a joining fixture that is used on building sites and in workshops.

**FIGURE 1.8**

- 1.8.1 Identify the joining fixture above. (1)
- 1.8.2 Name the fixing agent that should be used with this joining fixture. (1)
- 1.8.3 Explain ONE use of this joining fixture. (1)
- [20]**

QUESTION 2: GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)

Start this question on a NEW page.

FIGURE 2 on the next page shows different drawings that appear on a building plan.
Analyse the drawings and complete the table on ANSWER SHEET 2.

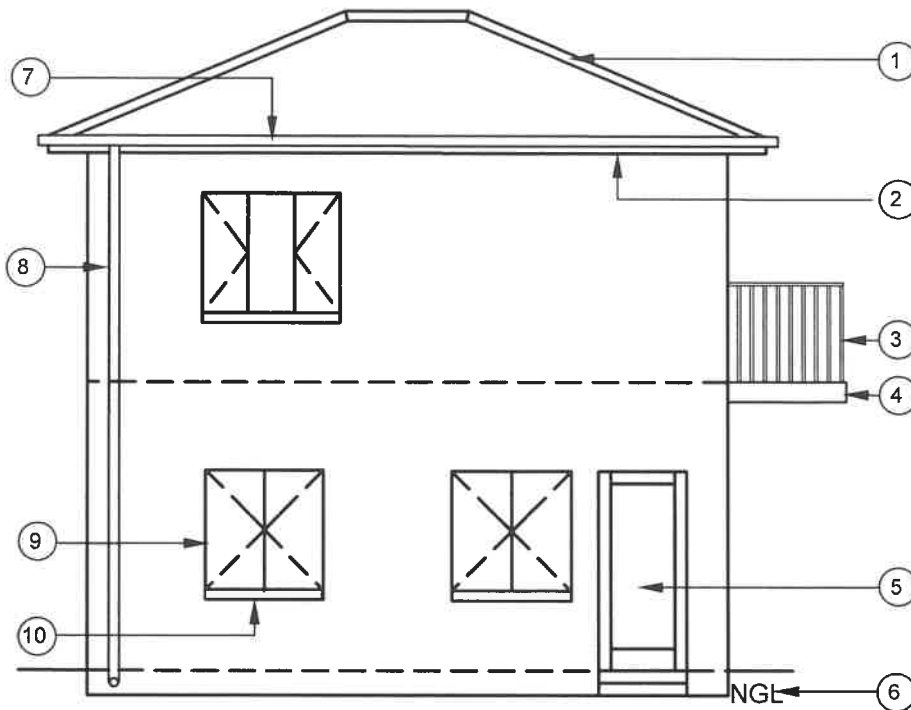


FIGURE A
SCALE 1 : 100

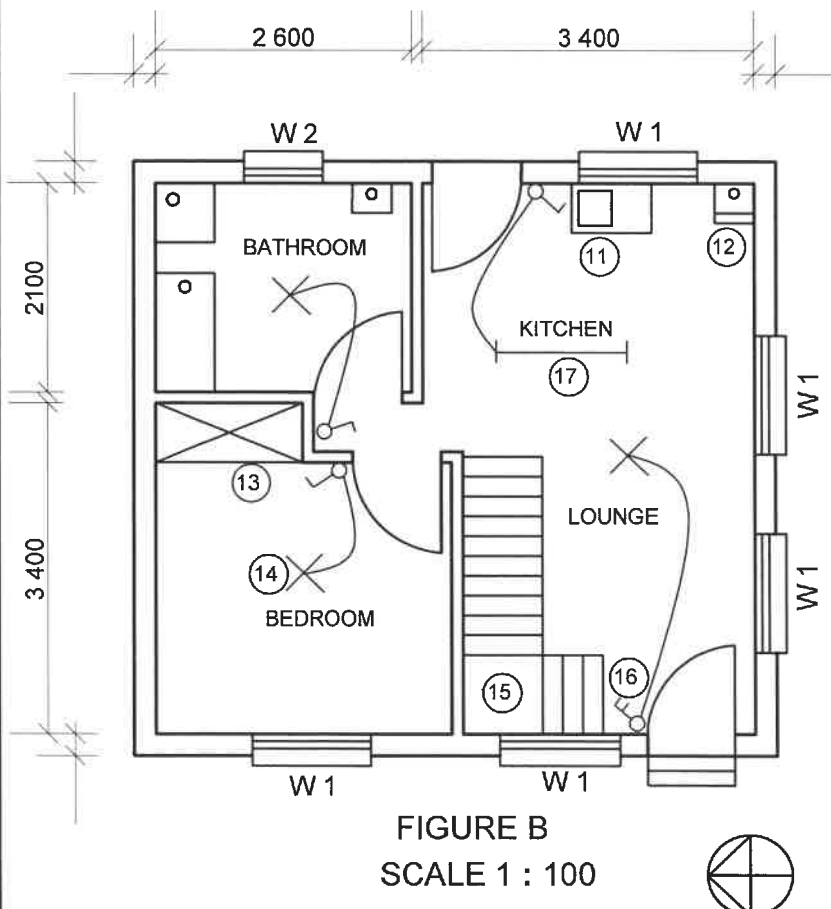


FIGURE B
SCALE 1 : 100

FIGURE 2

NOTE:

Contractors must verify all dimensions and levels on site before commencing work. Architects must be notified of any discrepancies immediately.

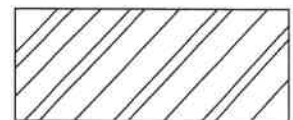
Wall thickness: External = 220 mm
Internal = 110 mm

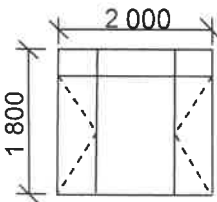
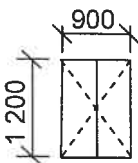
ARCHITECT'S SIGNATURE
CLIENT'S SIGNATURE

The following electrical installation should be installed in the kitchen:

W

The following symbol shows the type of brick finishing that will be used for the building:



REVISION		DATE		DESCRIPTION	
PRINTED BY: DLAMINI PRINTERS				DATE OF PRINT: 2019/04/01	
DRAWING TITLE: SITE PLAN STAND 502					
PROJECT: PROPOSED DWELLING ON STAND 502, DEO PARK					
PROJECT NO. GR 228-201				DRAWING NR. 339P9	
DATE 16/4/2019		DRAWN JP MBALI		CHECKED P CARTER	
				SCALE 1 : 100	
REFERENCE CODE QP 2-2019					
WINDOW 1			WINDOW 2		
					

[40]

QUESTION 3: CASEMENTS, CUPBOARDS, WALL-PANELLING AND QUANTITIES (SPECIFIC)

Start this question on a NEW page.

- 3.1 Give ONE word/term for each of the following descriptions by choosing a word/term from the list below. Write only the word/term next to the question numbers (3.1.1 to 3.1.4) in the ANSWER BOOK, e.g. 3.1.5 casement.

transom;	20 mm;	skirting;	18 mm;	stiles;	shuttering boards;
mullion;	9 m ² ;	8,5 m ² ;	16 mm;	frame;	frame stiles;
cornice;	32 mm;	glazing bars;	18 m ² ;	15 m ²	

- 3.1.1 The thickness of melamine used for cupboard doors (1)
- 3.1.2 To close the opening where the wall panel and the floor meet (1)
- 3.1.3 The area of the roof underlay for a lean-to roof of 2,5 m x 3 m (1)
- 3.1.4 The intermediate vertical member that separates two casements in a double casement (1)

- 3.2 FIGURE 3.2 below shows a vertical section through a certain part of a double casement window with a fanlight. Study the picture and answer the questions that follow.

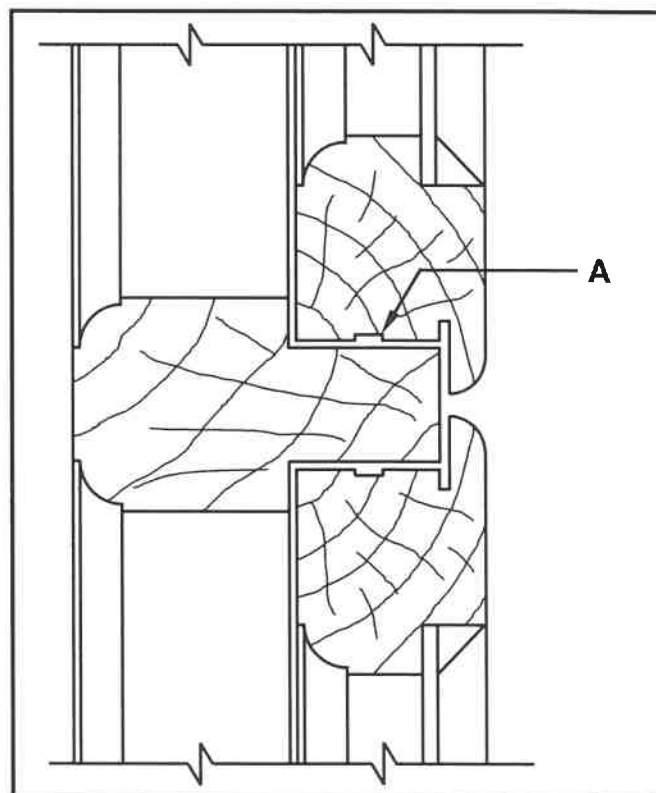


FIGURE 3.2

- 3.2.1 Name THREE timber parts of the casement and frame. (3)
- 3.2.2 Identify A. (1)

- 3.3 FIGURE 3.3 below shows the floor plan of a building with a gable roof. The external measurements are 8 000 mm x 4 000 mm.

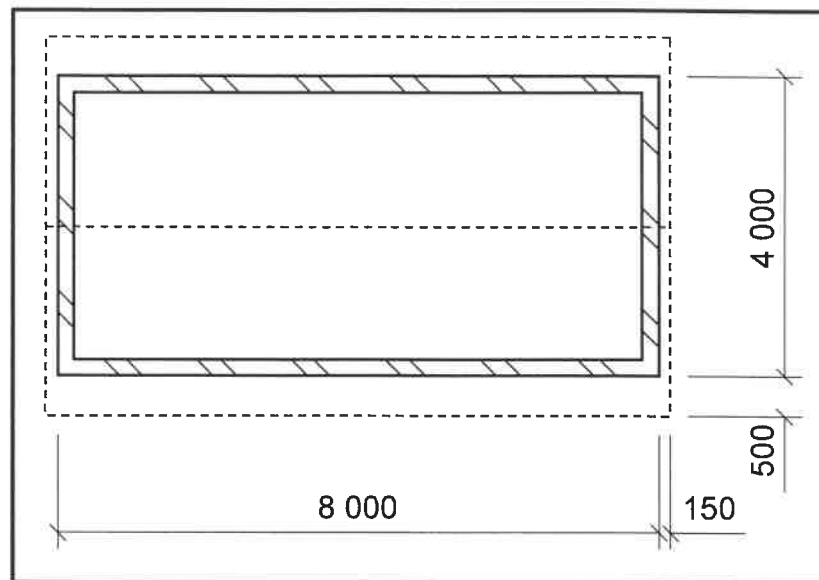


FIGURE 3.3

Use the following specifications:

- The walls are 220 mm thick.
- Type of roof: South African (Howe)
- Corrugated roof sheeting is used as roof covering.
- The pitch of the roof is 30°.
- The true length of the rafter is 2 900 mm.
- The length of one ridge plate is 1 800 mm.
- The corrugated roof sheeting projects 50 mm past the rafter.

Use the dimension paper on ANSWER SHEET 3.3 and calculate the quantities of the following materials needed for the roof:

3.3.1 Area of roof sheeting for the building (6)

3.3.2 Number of ridge plates (3)

- 3.4 Use ANSWER SHEET 3.4 and draw, in good proportion, a neat sketch of a vertical section through the top part of a wall panel that ends halfway between the ceiling and the floor.

Use the assessment criteria on the ANSWER SHEET as a guide. (5)

- 3.5 ANSWER SHEET 3.5 shows the front view of the framework of a built-in cupboard without the doors.

Use ANSWER SHEET 3.5 and complete, in good proportion, the given drawing.

Use the assessment criteria on the ANSWER SHEET as a guide.

(8)
[30]

QUESTION 4: ROOFS, CEILINGS, TOOLS AND EQUIPMENT, AND MATERIALS (SPECIFIC)

Start this question on a NEW page.

- 4.1 FIGURE 4.1 below shows two woodworking machines. Study the pictures and answer the questions that follow.

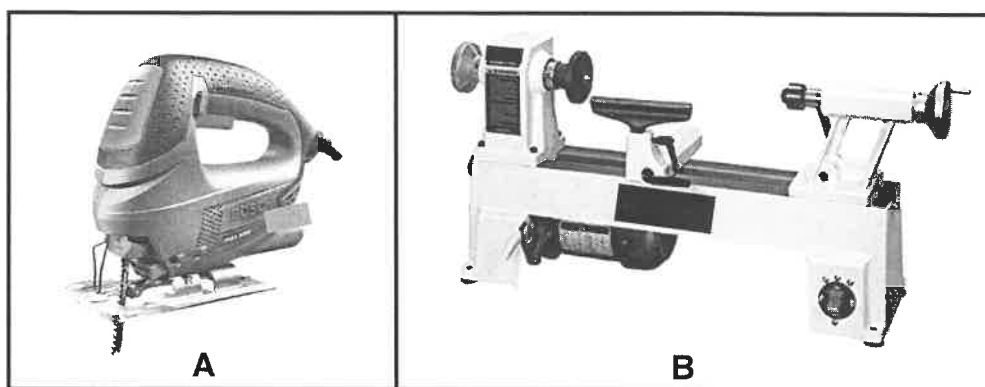


FIGURE 4.1

- 4.1.1 Identify **A** and **B**. (2)
- 4.1.2 Describe TWO aspects that must be considered when taking care of machine **A** in terms of its blade. (2)
- 4.1.3 Describe TWO safety aspects that one would check after mounting the work piece, before switching on **B**. (2)
- 4.2 Describe ONE way in which a belt sander can be stored. (1)
- 4.3 State TWO properties that are tested in both mechanical and visual grading. (2)
- 4.4 Describe the first THREE steps that need to be considered when preparing timber before applying preservatives. (3)
- 4.5 Differentiate between a *conventional trap door* and a *hinged trap door* in a ceiling in terms of the way in which it opens. (2)
- 4.6 Name TWO parts of a conventional trapdoor. (2)
- 4.7 Give the correct measurements for the following members of a roof:
- King post
 - Branderling
- (2)
- 4.8 Differentiate between *hurricane clips* and *storm clips* regarding the specific roof members that they will secure. (2)
- 4.9 Use ANSWER SHEET 4.9 and draw to scale 1 : 20 a close-coupled roof truss with a pitch of 30°, a span of 3 metres and an eaves overhang of 400 mm. The truss rests on two supporting walls.
- Use the assessment criteria on the ANSWER SHEET as a guide. (20)
- [40]**

QUESTION 5: CENTRING, FORMWORK, SHORING AND GRAPHICS AS MEANS OF COMMUNICATION (SPECIFIC)

Start this question on a NEW page.

- 5.1 Name the type of lagging that you would use for the centres when you have to build the following:
- 5.1.1 Rough arch (1)
- 5.1.2 Gauged arch (1)
- 5.2 Draw in your ANSWER BOOK, in good proportion, a centre for a semicircular arch that will be built over a door opening. Label any TWO parts on the drawing. (6)
- 5.3 Name the material that can be used for the sides of the formwork for a square column, which saves time because no surface finishing is needed and no absorption of moisture from the concrete takes place. (1)
- 5.4 What will you apply to the formwork before the casting of concrete to prevent the concrete from clinging to the inside of the formwork when striking takes place? (1)
- 5.5 FIGURE 5.5 on ANSWER SHEET 5.5 shows the incomplete formwork of a concrete beam. Use ANSWER SHEET 5.5 and draw, in good proportion, ONLY the left half of the vertical section of the formwork for the concrete beam.
- Use the assessment criteria on the ANSWER SHEET as a guide. (8)

- 5.6 FIGURE 5.6 shows a line diagram of a double-flying shore between two walls. Label **A** to **F**.

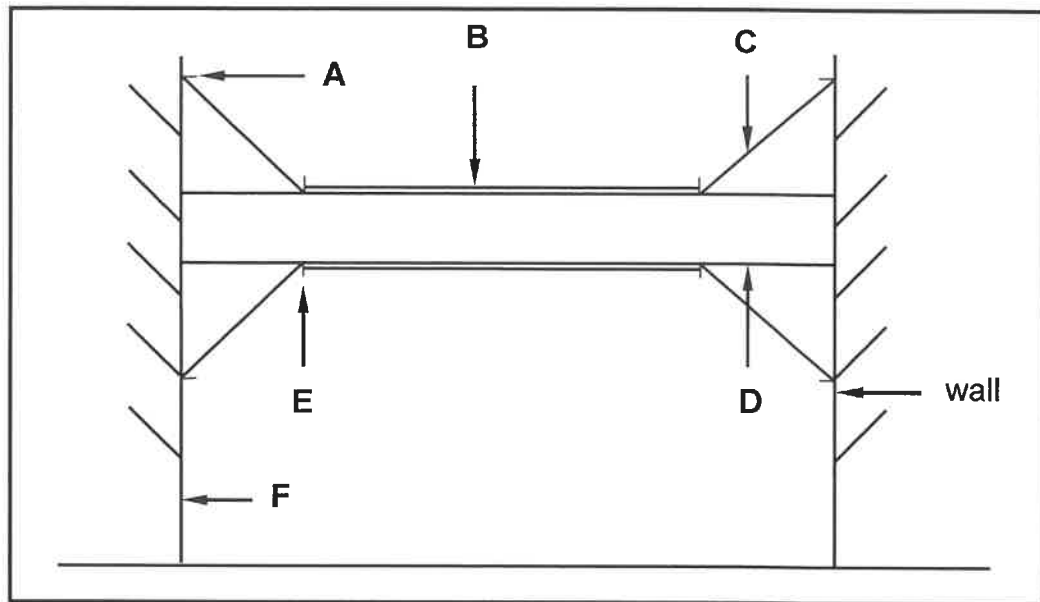


FIGURE 5.6

(6)

- 5.7 Use ANSWER SHEET 5.7 and draw to scale 1 : 2 an assembled isometric view of a stub haunched mortise and tenon joint to join a stile and a top rail. The timber used is 60 mm wide and 20 mm thick.

Start the drawing from the given corner on ANSWER SHEET 5.7.

Do NOT show hidden details.

Use the assessment criteria on the ANSWER SHEET as a guide.

(6)
[30]

QUESTION 6: SUSPENDED FLOORS, STAIRCASES, IRONMONGERY, DOORS AND JOINING (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 6.1.5) in the ANSWER BOOK, e.g. 6.1.6 C.

- 6.1.1 Screws are generally used to secure a hinge onto the frame and ... of a door. (1)
- A top rail
 - B bottom rail
 - C muntin
 - D stile
- 6.1.2 A wall plate can be secured to a wall with ... (1)
- A oval wire nails.
 - B self-tapping hexagonal screws.
 - C truss hangers.
 - D a double strand of 2,5 mm diameter galvanised wire.
- 6.1.3 IBR sheeting are secured to ... (1)
- A purlins with roofing nails.
 - B rafters with roofing nails.
 - C rafters with gang nails.
 - D purlins with clout nails.
- 6.1.4 The haunch of a haunched mortise and tenon joint ... (1)
- A adds strength and prevents the rail from twisting.
 - B decreases the bonding area.
 - C gives a more appealing look to the joint.
 - D is half the thickness of the rail.
- 6.1.5 Window panes are fixed onto casement members with ... (1)
- A casement stays.
 - B glazing beads.
 - C rails.
 - D casement fasteners.

6.2 FIGURE 6.2 below shows an assembled view of a timber joint.

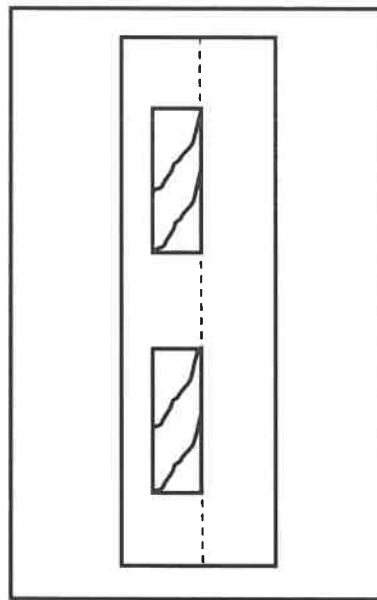


FIGURE 6.2

- 6.2.1 Identify the type of joint. (1)
- 6.2.2 Name ONE type of door where you will use this joint. (1)
- 6.3 Draw in your ANSWER BOOK, in good proportion, two horizontal sectional views to show the difference between a *door frame* and a *jamb lining* fixed to a wall. Print the title below ONE of these drawings. (6)
- 6.4 Draw in your ANSWER BOOK, in good proportion, a horizontal section through a muntin and raised panels of a three-panel door. (6)
- 6.5 Name TWO places where a straight cupboard lock can be used. (2)
- 6.6 Name a lock that is mounted onto the internal surface of doors to provide extra security. (1)
- 6.7 FIGURE 6.7 on ANSWER SHEET 6.7 shows the top view of the walls around a staircase. Use ANSWER SHEET 6.7 and draw, in good proportion, the top view of a flight of stairs with an open well and a half-landing within the given walls. (6)
- Use the assessment criteria on the ANSWER SHEET as a guide. (6)
- 6.8 FIGURE 6.8 on ANSWER SHEET 6.8 shows the external wall of a building to accommodate a suspended timber floor. Draw, in good proportion, the suspended floor on ANSWER SHEET 6.8. (12)
- Use the assessment criteria on the ANSWER SHEET as a guide. [40]

TOTAL: 200

CENTRE NUMBER:

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EXAMINATION NUMBER:

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ANSWER SHEET 2

NO.	QUESTION	ANSWER	MARKS
1	Identify the elevation in FIGURE A.		1
2	Identify the type of roof that is used on the building in FIGURE A.		1
3	Identify number 1.		1
4	Identify number 4.		1
5	Identify number 5.		1
6	Identify number 7.		1
7	Identify number 8.		1
8	Identify number 12.		1
9	Identify number 13.		1
10	Identify number 15.		1
11	Identify the company that printed the building plan.		1
12	Name a suitable material that can be used for the manufacturing of number 2.		1
13	Name the drawing symbol in the column for the notes in FIGURE 2 that must be installed in the kitchen.		1
14	Name the drawing symbol in the column for the notes in FIGURE 2 that indicates the type of bricks for the building.		1
15	Name a material that should NOT be used to manufacture the frame of number 9 for coastal areas.		1

16	Name a material that can be used to manufacture the sanitary fitting indicated by number 11.		1
17	Who checked the building plan?		1
18	How many types of windows are used in FIGURE B?		1
19	What does the abbreviation <i>NGL</i> at number 6 stand for?		1
20	Give the reference code for this plan.		1
21	Which room will electrical symbol 16 serve?		1
22	Describe the purpose of number 3.		2
23	Explain what the curved lines between the electrical installations in FIGURE B indicate.		2
24	Explain why the light switch is mounted on the outside of the bathroom.		1
25	Identify in FIGURE 2 which elevation does NOT have windows.		1
26	Identify the thickness of the internal wall in FIGURE 2.		1
27	Differentiate between symbols 13 and 15 in terms of their purpose.		2
28	Justify why FIGURE B is a ground floor plan.		1

29	Predict what will happen if number 10 is NOT installed.		1
30	Redraw the staircase in FIGURE B in the adjacent column and indicate the direction of the flight with arrows.		2
31	Calculate the total length of the wall on the eastern side of the building. Show ALL calculations.		6
		TOTAL:	40

CENTRE NUMBER:							
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[illegible]

ANSWER SHEET 3.3

Dimension paper

[illegible]

CENTRE NUMBER:

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EXAMINATION NUMBER:

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ANSWER SHEET 3.4

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Wall	1	
Capping	1	
Rough ground	1	
Tongue and groove board	1	
Correctness of drawing	1	
TOTAL:	5	

CENTRE NUMBER:

[illegible]

ANSWER SHEET 3.5

[illegible]

ASSESSMENT CRITERIA	MARK	CM
Top shelf (full width)	1	
Intermediate side in middle	1	
Hanging space on left side	1	
Oval hanging rail	1	
FOUR shelves	2	
TWO drawer units below shelving	1	
Correctness of drawing	1	
TOTAL:	8	

FIGURE 3.5

[illegible]

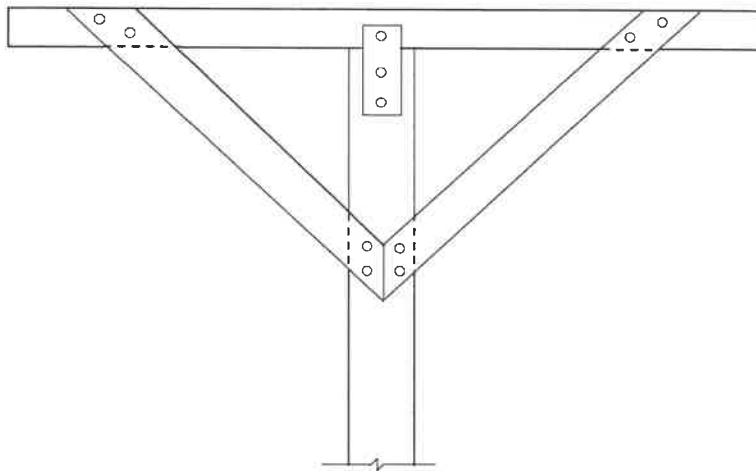
ASSESSMENT CRITERIA	MARK	CM
Walls drawn correctly	2	
Wall plates drawn correctly	2	
Tie beam drawn correctly	2	
Rafters drawn correctly	2	
Ridge beam drawn correctly	2	
Overhang drawn correctly	2	
Labels (any TWO)	2	
Span	1	
Dimensions of members (any TWO)	2	
Application of scale: ONE or TWO incorrect = 3 THREE or FOUR incorrect = 2 More than FIVE incorrect = 1 NO measurement correct = 0	3	
TOTAL:	20	

CENTRE NUMBER:

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EXAMINATION NUMBER:

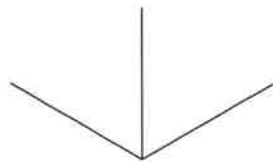
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ANSWER SHEET 5.5**FIGURE 5.5**

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Shuttering board side	1	
Cleat	1	
Kicker/Fixing plate	1	
Wedge	1	
Stay/Strut	1	
Any TWO labels	2	
Correctness of drawing	1	
TOTAL:	8	

CENTRE NUMBER:									
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EXAMINATION NUMBER:														
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ANSWER SHEET 5.7

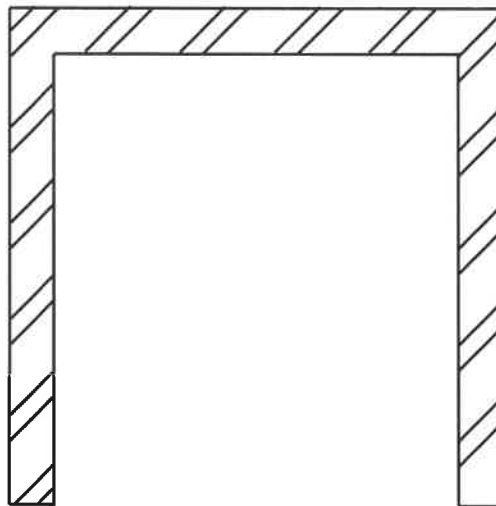
ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Stile	1	
Top rail	1	
Haunch	3	
Application of scale	1	
TOTAL:	6	

CENTRE NUMBER:

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EXAMINATION NUMBER:

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ANSWER SHEET 6.7**FIGURE 6.7**

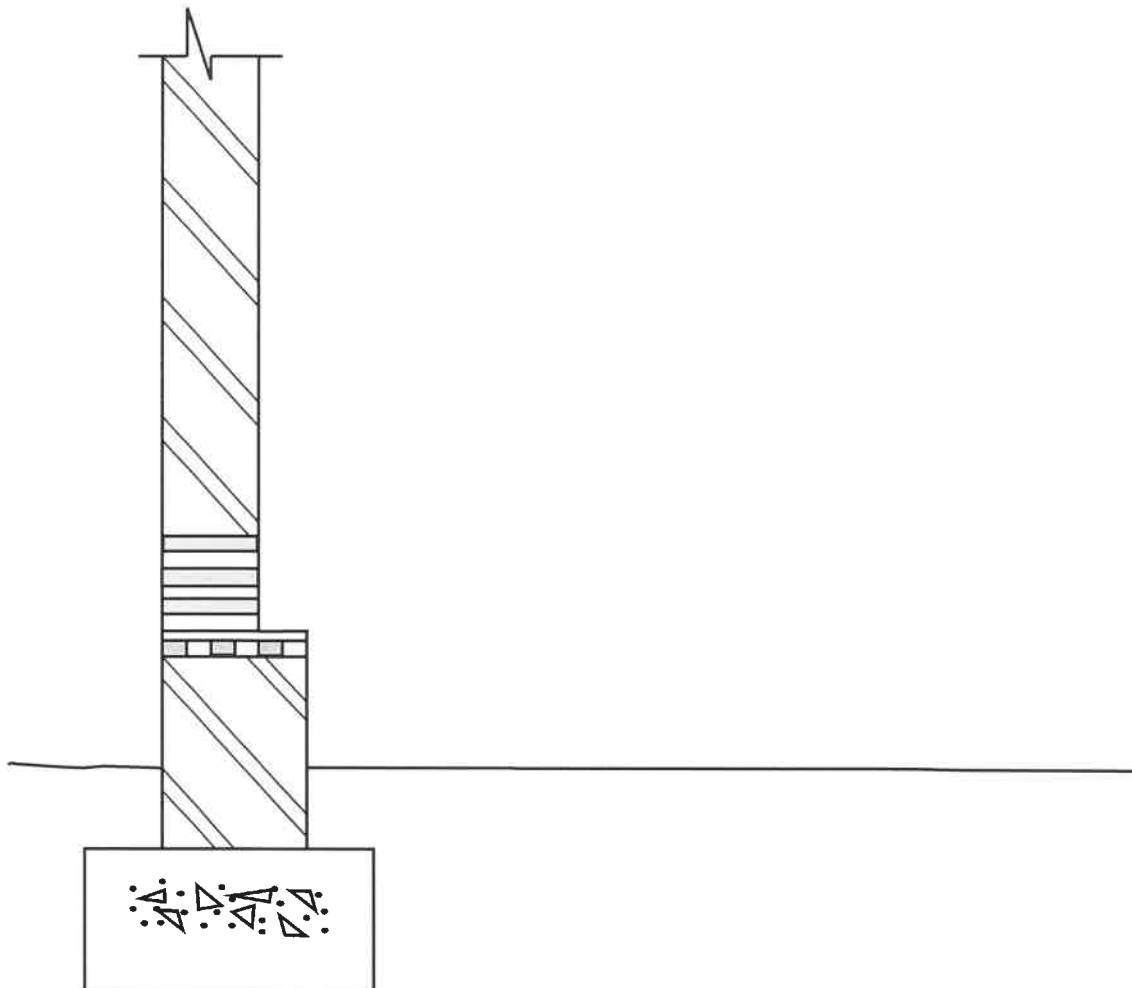
ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Treads on each flight of stairs	2	
Half-landing	1	
Newel post	1	
Open well	1	
Correctness of drawing	1	
TOTAL:	6	

CENTRE NUMBER:

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EXAMINATION NUMBER:

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ANSWER SHEET 6.8**FIGURE 6.8**

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Bearer	1	
Joists	2	
Wall plate	1	
Tongue and groove floorboard	1	
Skirting	1	
Quadrant	1	
Hatching	1	
Labels for: Ant guard	1	
Air brick	1	
DPC	1	
Correctness of drawing	1	
TOTAL:	12	