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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE/ NATIONAL SENIOR CERTIFICATE

GRADE 12

CIVIL TECHNOLOGY: WOODWORKING

NOVEMBER 2020

MARKS: 200

TIME: 3 hours

This question paper consists of 14 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.
2. Answer ALL the questions.
3. Read all questions carefully.
4. Answer each question as a whole. Do NOT separate subsections of questions.
5. Number the answers correctly according to the numbering system used in this question paper.
6. Start the answer to EACH question on a NEW page.
7. Do NOT write in the margins of the ANSWER BOOK.
8. You may use sketches to illustrate your answers.
9. Write ALL calculations and answers in the ANSWER BOOK or on the attached ANSWER SHEETS.
10. Use the mark allocation as a guide to the length of your answers.
11. 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*.
12. For the purpose of this question paper, the size of a brick should be taken as 220 mm x 110 mm x 75 mm.
13. Use your own discretion where dimensions and/or details have been omitted.
14. Answer QUESTIONS 2, 3.3, 3.4, 3.5, 4.11, 5.6 and 6.9 on the attached ANSWER SHEETS using drawing instruments, where necessary.
15. 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.
16. Drawings in the question paper are NOT to scale due to electronic transfer.
17. Google Images was used as the source of all photographs and pictures.
18. Write neatly and legibly.

**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	Powder coating	A	must be inclined slightly towards a building
1.1.2	Rungs	B	is used with the dumpy level to measure heights accurately
1.1.3	Wing nut	C	allows a worker to climb up or down a ladder
1.1.4	Rawl bolts	D	can be tightened or loosened without using a spanner
1.1.5	Telescopic staff	E	suitable for outdoor furniture
1.1.6	Accident	F	result of an unsafe act or unsafe condition
1.1.7	Putlog scaffold	G	must not be placed where it may obstruct the access to or the exit from a building site
1.1.8	Building rubble	H	resists pull-out failure
		I	must be secured firmly when there is any sagging
		J	prevent(s) workers from falling off a scaffold
		K	disposal of waste materials and debris

(8 x 1) (8)

- 1.2 Explain ONE advantage of galvanising. (1)
- 1.3 Name the document on hazardous chemical substances which the OHS Act requires employers to provide to interested or affected persons. (1)
- 1.4 Describe TWO methods that can be used to move building material around the site. (2)

- 1.5 State TWO specific advantages of water-based paint. (2)
- 1.6 You were tasked to locate steel bars and copper pipes placed into a wall.
- 1.6.1 Name the tool you would use to detect these materials. (1)
- 1.6.2 Describe how you would take care of this tool after using it. (2)
- 1.7 FIGURE 1.7 below shows a joining fixture that is commonly used.

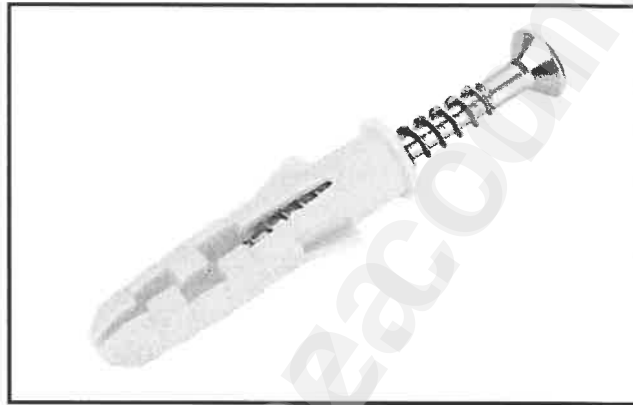


FIGURE 1.7

Explain how this joining fixture can be used to secure a bracket to a wall.

(3)
[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.

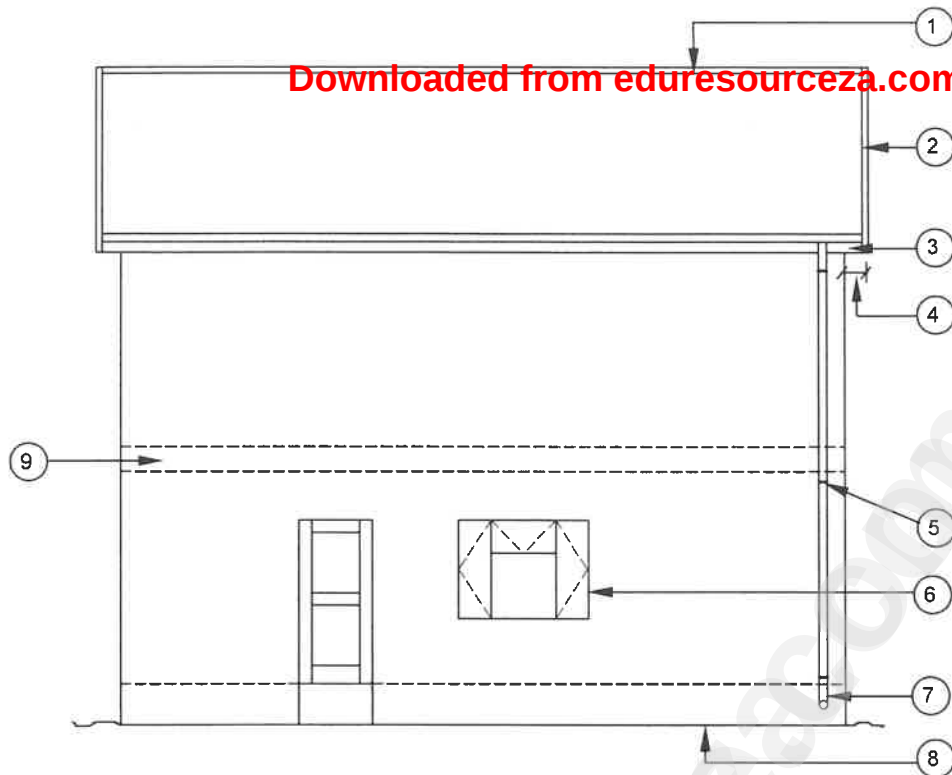


FIGURE A

SCALE 1 : 100

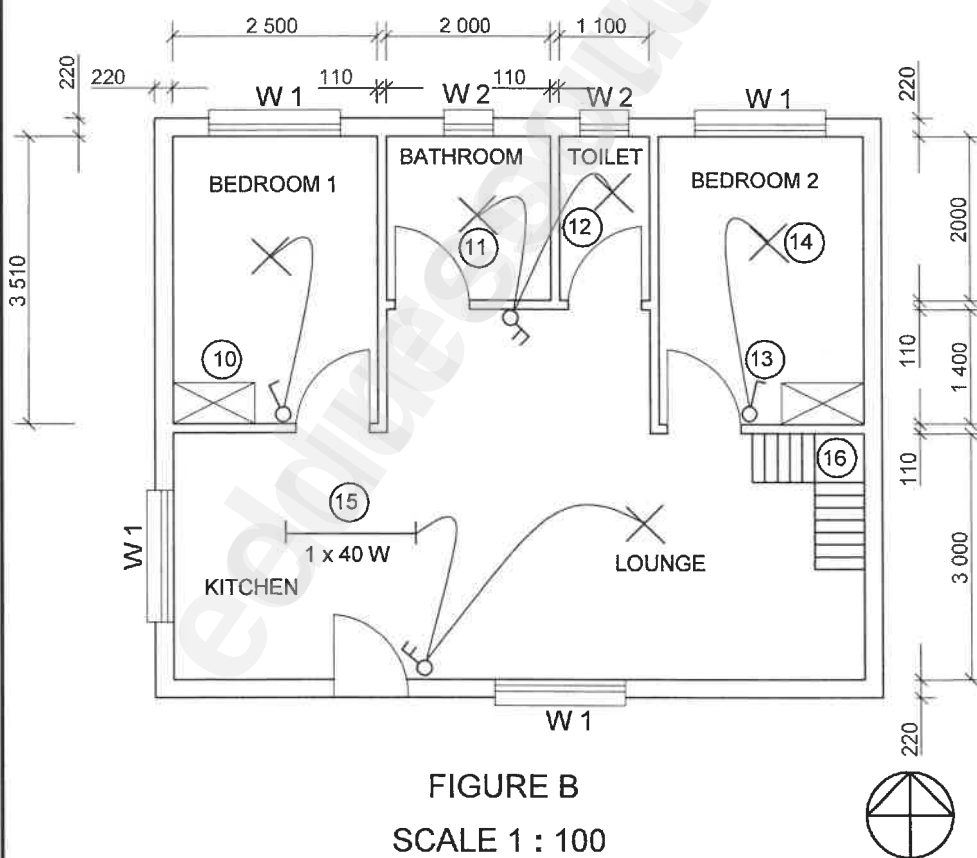


FIGURE B

SCALE 1 : 100

NOTES:

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

ARCHITECT'S SIGNATURE
CLIENT'S SIGNATURE

Brick force must be installed every third course up to window height. From the top of the window, brick force must be installed between every course up to wall plate height.

DPM must be fitted under the floor slab to prevent water from penetrating from the substructure.

The following electrical fittings must be installed in the kitchen:

(17)

2 x 40 W

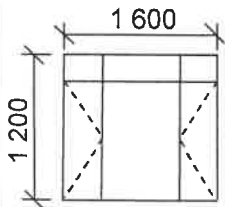
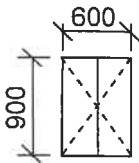
REVISION	DATE	DESCRIPTION	
PRINTED BY: MTANDO PRINTERS		DATE OF PRINT: 01/04/2020	
DRAWING TITLE: SITE PLAN STAND 101			
PROJECT: PROPOSED DWELLING ON STAND 101, JABULANI STREET, CRADOCK			
PROJECT NO. GR 448-210		DRAWING NO. 559P7	
DATE 27/03/2020	DRAWN N DAMON	CHECKED P HENSLO	SCALE 1 : 100
REFERENCE CODE QP 4-2020			
WINDOW 1		WINDOW 2	
			

FIGURE 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 3.1.5) in the ANSWER BOOK, e.g. 3.1.6 skirting.

cornice; quadrant; window sill; mullion; glazing bar; front rail; mortice and tenon; tongue and groove; putty; panel pins; glue; PVC; capping; paint; top rail; varnish

- 3.1.1 The moulding between the skirting and the floor (1)
- 3.1.2 The member that separates the main parts of a double casement vertically (1)
- 3.1.3 Used to keep the window pane in place (1)
- 3.1.4 The joint used to join the strip boards used in wall panels (1)
- 3.1.5 Horizontal member of the casement that is found directly below the transom (1)
- 3.2 Use your ANSWER BOOK and draw in good proportion a neat vertical section through the transom of a casement frame with a fanlight. (4)
- 3.3 Use ANSWER SHEET 3.3 and draw to scale 1 : 10 the front view of a freestanding kitchen cupboard with two doors. The left-hand bottom of the cupboard must start at A on the ANSWER SHEET.

Use the following specifications:

- Height: 950 mm
- Width: 900 mm
- 16 mm melamine board is used for the construction of the cupboard
- Doors: 450 mm wide

Use the assessment criteria on the ANSWER SHEET as a guide. (9)

- 3.4 FIGURE 3.4 on ANSWER SHEET 3.4 shows a horizontal section through a part of a wall. Use ANSWER SHEET 3.4 and draw in good proportion a neat horizontal sectional view of the bottom part of a wall panel showing how the strip boards are joined.

Use the assessment criteria on the ANSWER SHEET as a guide. (4)

- 3.5 FIGURE 3.5 below shows the floor plan of a garage with a hipped roof. The width of the walls is 220 mm. Study the figure and answer the questions that follow. Show ALL calculations.

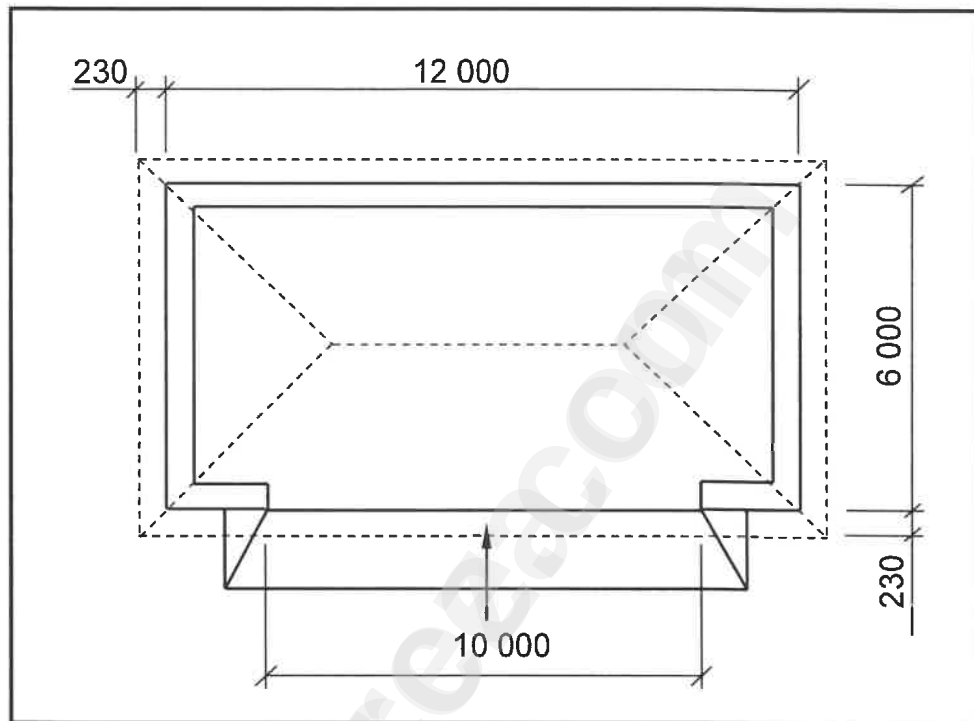


FIGURE 3.5

Use ANSWER SHEET 3.5 and calculate the following:

- 3.5.1 The length of fascia board needed for the roof (4)
- 3.5.2 The length of skirting needed for the garage (4)
- [30]**

QUESTION 4: ROOFS, CEILINGS, TOOLS AND EQUIPMENT, AND MATERIALS
(SPECIFIC)
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Start this question on a NEW page.

- 4.1 FIGURE 4.1 below shows an electrical hand tool. Study the picture and answer the questions that follow.



FIGURE 4.1

- 4.1.1 Identify the tool. (1)
- 4.1.2 Describe what can happen if no personal safety equipment is worn while operating this hand tool. (2)
- 4.1.3 Why should this hand tool be stored in a safe, dry place? (1)
- 4.2 FIGURE 4.2 below shows a thickness planer. Study the picture and answer the questions that follow.



FIGURE 4.2

- 4.2.1 Explain what would happen if you adjusted the height of the table while the machine is in operation. (2)
- 4.2.2 Explain what care must be taken to maximise the use of the blades of the machine. (2)

- 4.3 Name the different types of roof underlays for EACH of the following roofs:
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- 4.3.1 Tiled roofs (1)
- 4.3.2 Thatch roofs (1)
- 4.3.3 IBR roof sheeting (1)
- 4.4 Draw in your ANSWER BOOK a top view of a roof to show the valley between two inclined roofs. (3)
- 4.5 Give ONE reason why you would close an open eave. (1)
- 4.6 Explain why you would rather use fibre-cement ceiling board on closed eaves than gypsum ceiling board. (1)
- 4.7 Describe TWO disadvantages of EACH of the following roof coverings:
- 4.7.1 Concrete roof tiles (2)
- 4.7.2 Thatch roofs (2)
- 4.7.3 Corrugated iron sheeting (2)
- 4.8 Name TWO parts of the roof construction onto which the framework of a trapdoor will be secured. (2)
- 4.9 Explain why you would rather use mechanically graded timber than visually graded timber for roof construction. (2)
- 4.10 Give TWO reasons why timber must be preserved. (2)
- 4.11 Use ANSWER SHEET 4.11 and draw to scale 1 : 50 a king post roof truss. Start the drawing on the lines indicated on the ANSWER SHEET.
- Use the assessment criteria on the ANSWER SHEET as a guide. (12)
- [40]**

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

Start this question on a NEW page.

- 5.1 FIGURE 5.1 below shows the construction detail at the foot of a centre. Identify parts A to E.

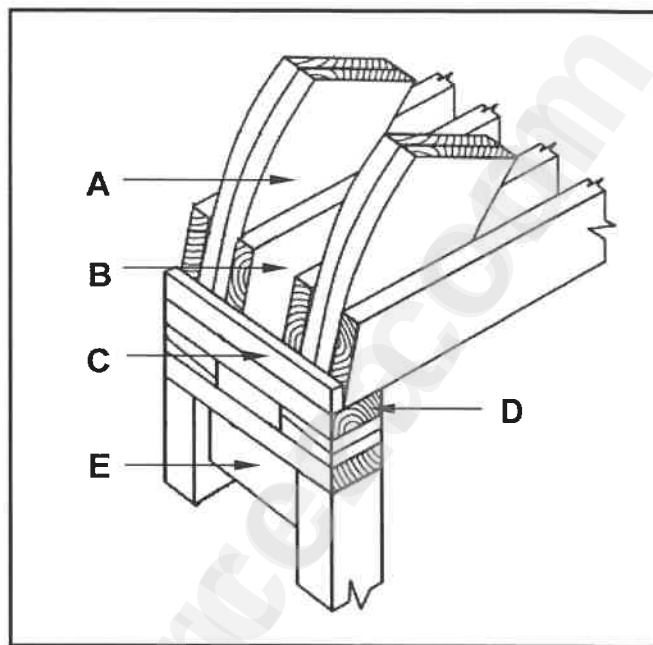


FIGURE 5.1

(5)

- 5.2 Justify the use of an adjustable steel prop rather than a wooden prop when installing formwork.

(1)

- 5.3 FIGURE 5.3 below shows part of the detail of a dead shore. Study the drawing and answer the questions that follow.

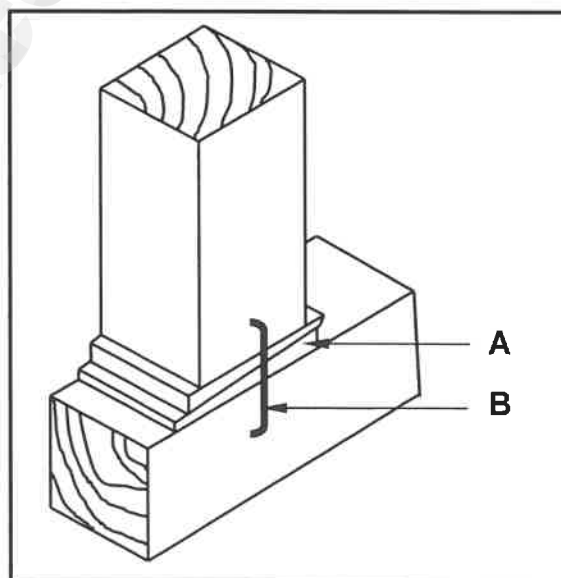


FIGURE 5.3

5.3.1 Name ONE type of shoring other than dead shoring. (1)

5.3.2 Explain the use of **A**. (1)

5.3.3 Describe the purpose of **B**. (1)

5.4 FIGURE 5.4 below shows a dead shore that was constructed incorrectly. Redraw the table below into your ANSWER BOOK and identify TWO possible mistakes in the construction of the dead shore AND recommend possible solutions to rectify the mistakes.

NO.	MISTAKES IN THE CONSTRUCTION OF THE DEAD SHORE	POSSIBLE SOLUTIONS TO RECTIFY THE MISTAKES
1		
2		

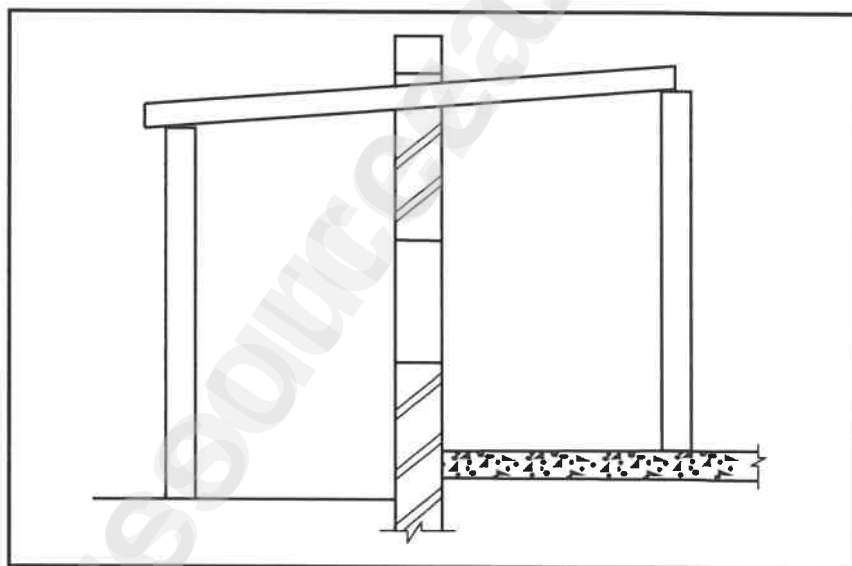


FIGURE 5.4

(4)

5.5 Differentiate, by means of TWO line diagrams, between a *couple roof truss* and a *collar-tie roof truss* in your ANSWER BOOK. Show the walls as part of your answer. (8)

5.6 FIGURE 5.6 on ANSWER SHEET 5.6 show two walls that must support an in-situ cast concrete floor. Use ANSWER SHEET 5.6 and draw in good proportion a vertical section through the formwork for an in-situ cast concrete floor. Show the support for the formwork on one side of a supporting wall. (9)

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

(9)
[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 E.

- 6.1.1 The walls of a substructure can be ...
A any width.
B 330 mm or 220 mm wide.
C 220 mm or 110 mm wide.
D None of the above-mentioned (1)
- 6.1.2 The minimum measurement of a tread for stairs is ...
A 250 mm.
B 750 mm.
C 150 mm.
D 350 mm. (1)
- 6.1.3 The ... is the member that is fixed onto a door frame and into which the latch and bolt of a lock fit.
A diagonal plate
B stop plate
C keeper
D back plate/striker plate (1)
- 6.1.4 The vertical member between two panels of a door is called a ...
A lock rail.
B transom.
C muntin.
D middle rail. (1)
- 6.1.5 A door can be attached to a door frame by using various types of ...
A screws.
B nails.
C clamps.
D hinges. (1)

- 6.2 FIGURE 6.2 below shows part of the floor plan of a suspended timber floor. Study the drawing and name parts A to D.

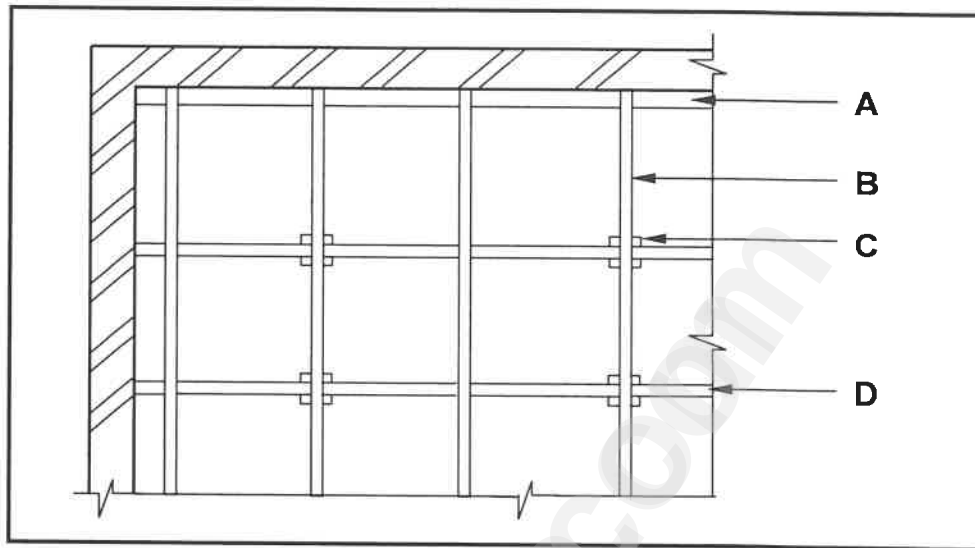


FIGURE 6.2

(4)

- 6.3 Justify why the concrete base under part C in FIGURE 6.2 should be wider than part C. (1)
- 6.4 Draw in your ANSWER BOOK, in good proportion, the top view of part of the layout of the upper level of the suspended floor to show how the struts are staggered. (3)
- 6.5 Explain why ant guards used for suspended timber floors must be made from galvanised steel. (1)
- 6.6 Distinguish between *cut cupboard locks* and *drawer/till locks* regarding the direction of the bolts of the locks when locking. (2)
- 6.7 Draw in your ANSWER BOOK, in good proportion, a vertical section through a lock rail and part of the raised panels of a three-panel door. (6)

- 6.8 FIGURE 6.8 below shows the assembled view of a haunched mortice and tenon joint. Study the drawing and name parts **A** to **D**.

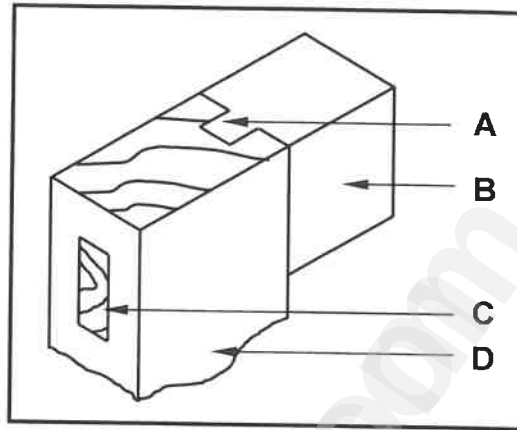


FIGURE 6.8

(4)

- 6.9 FIGURE 6.9 on ANSWER SHEET 6.9 shows the bottom half of the internal elevation of a framed ledged and braced batten door.

Use ANSWER SHEET 6.9 and draw the following:

- 6.9.1 The brace (1)
- 6.9.2 The sectional view of section **A-A**. Draw the sectional view two times bigger than the given view. (5)

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

- 6.10 Draw in your ANSWER BOOK a line diagram of the top view of a straight flight of stairs with a landing between the steps.

Show the following on your drawing:

- 110 mm wall
- Three treads on both sides of the landing
- Landing
- Handrail
- Two newel posts
- Arrows indicating the rise of the stairs

(8)
[40]

TOTAL: 200

CENTRE NUMBER:

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EXAMINATION NUMBER:

ANSWER SHEET 2

NO.	QUESTION	ANSWER	MARKS
1	Identify the elevation in FIGURE A.		1
2	Describe the type of house that is indicated in FIGURE A.		1
3	Identify number 1.		1
4	Identify number 3.		1
5	Identify number 4.		1
6	Identify the fastener indicated by number 5.		1
7	Identify number 6.		1
8	Identify number 7.		1
9	Identify number 8.		1
10	What does <i>DPM</i> stand for, as indicated in the notes?		1
11	Identify number 10.		1
12	Recommend a suitable material that can be used for the manufacturing of number 2 in FIGURE A.		1
13	Name the TWO elevations on which number 2 is installed.		2
14	Describe the purpose of number 3.		1
15	Deduce ONE feature that has been omitted from the elevation in FIGURE A.		1
16	Recommend any TWO sanitary fitments carrying waste-water, other than a bath, that can be installed in the room indicated by number 11.		2

17	What sanitary fixture carrying soil water can be installed in the room indicated by number 12?		1
18	Describe the error that appears at number 6 in the elevation in FIGURE A.		1
19	State the reference code for this plan.		1
20	Which room will number 13 serve?		1
21	What does the line between numbers 13 and 14 represent?		1
22	Differentiate between number 15 in FIGURE B and number 17 in the notes.		2
23	Explain the installation of brick force from the top of the window to the wall plate, as indicated by the architect.		1
24	Recommend a possible finish for the outside walls of the house.		1
25	Deduce from FIGURE 2 which elevation does NOT have windows.		1
26	Deduce the thickness of the external wall from FIGURE 2.		1
27	Name a material that can be used to close the open sides of number 16.		1
28	Name the town in which the proposed dwelling will be build.		1
29	Calculate the area of the bathroom. Show ALL calculations. Give your answer in m ² .		3
30	Calculate the total length of the wall on the eastern side of the building. Show ALL calculations. The length must be indicated in metres.		6
		TOTAL:	40

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[illegible]

A L

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Kick plate	1	
Sides	1	
Top rail	1	
Bottom shelf	1	
Top 32 mm thick	1	
Top overhang 30 mm on either side	1	
Middle shelf	1	
Doors	1	
Correctness of drawing	1	
TOTAL:	9	

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[illegible][illegible]

CENTRE NUMBER:

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EXAMINATION NUMBER:

ANSWER SHEET 4.11

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
220 mm walls with inside span of 4 000 mm	2	
Wall plates 114 x 38 mm	2	
Tie beam 114 x 38 mm	1	
Rafters 114 x 38 mm	2	
King post 114 x 38 mm	1	
Correctness of drawing	1	
Application of scale:		
ONE or TWO incorrect = 3	3	
THREE or FOUR incorrect = 2		
More than FIVE incorrect = 1		
NO measurements correct = 0		
TOTAL:	12	

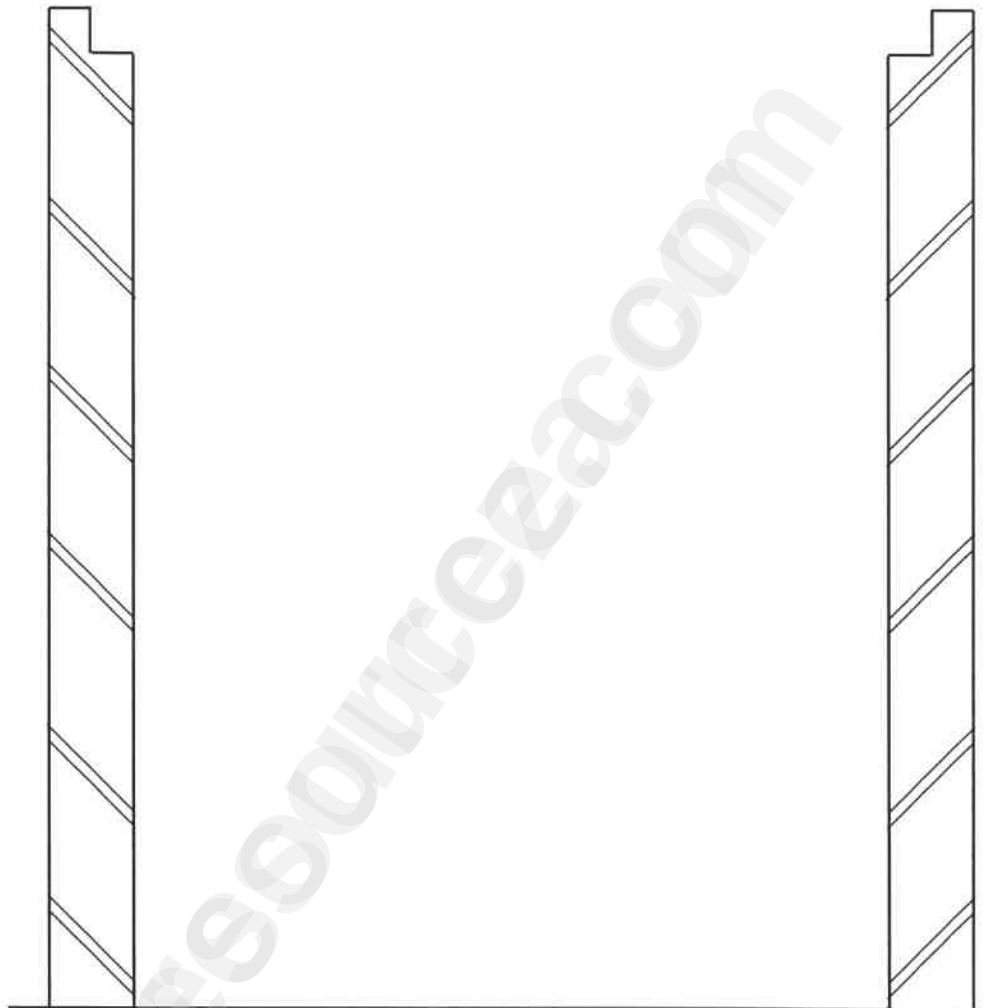
(12)

CENTRE NUMBER:

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EXAMINATION NUMBER:

ANSWER SHEET 5.6



ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Soffit/Shutter board	1	
Bearer	1	
Cross bearer	1	
Prop	1	
Folding wedges	1	
Soleplate	1	
Any TWO labels	2	
Correctness of drawing	1	
TOTAL:	9	

(9)

CENTRE NUMBER:

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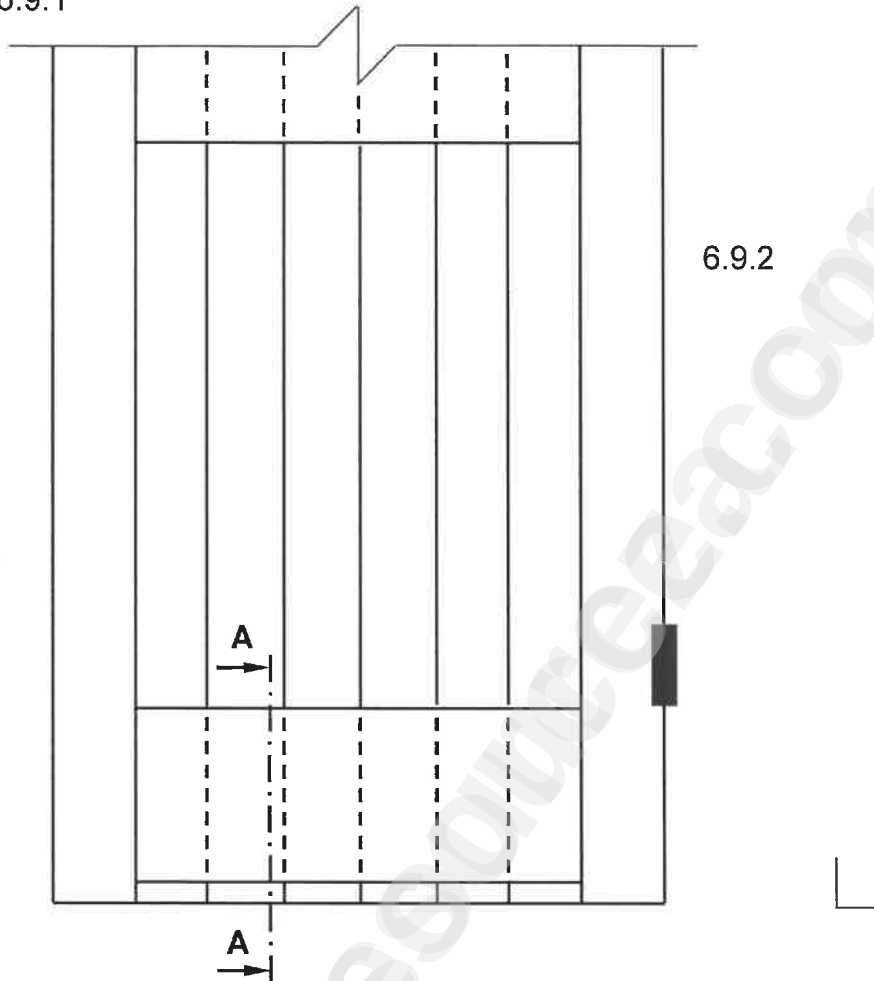
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ANSWER SHEET 6.9

6.9.1



6.9.1

FIGURE 6.9

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Brace	1	
TOTAL:	1	

6.9.2

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
V tongue and groove batten	1	
Brace	1	
Bottom rail	1	
Hatching	1	
Arrow indicating the style	1	
TOTAL:	5	

(1)

(5)