

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2020

CIVIL TECHNOLOGY: WOODWORKING (EXEMPLAR)

MARKS: 200

TIME: 3 hours



This question paper consists of 18 pages, including 4 answer sheets.

REQUIREMENTS:

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

INSTRUCTIONS AND INFORMATION

- 1. This question paper consists of SIX questions: THREE questions are generic and THREE questions are subject specific.
- 2. Answer ALL the guestions.
- 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 4.1, 4.3, 6.6 and 6.10 on the attached ANSWER SHEETS, using drawing instruments where necessary.
- 13. Write your NAME on all ANSWER SHEETS and hand them in with your ANSWER BOOK, whether you have answered the question or not.
- 14. Drawings in the question paper are NOT to scale.

QUESTION 1: SAFETY AND MATERIALS (GENERIC)

Start this question on a NEW page.

1.1	What type of personal protective clothing is compulsory to wear on a building site at all times?						
1.2	-	Why should you remove your tie when you are operating machines with moving parts?					
1.3	Identif	y the following statements as TRUE or FALSE.					
	1.3.1	Two operators are allowed to operate a machine at the sa	me time.	(1)			
	1.3.2	Petrol engines may be used inside the workshop.		(1)			
	1.3.3	Carry tools with sharp points facing downwards.		(1)			
	1.3.4	Non-slip footwear is compulsory when you operate machi	nery.	(1)			
1.4	Answer the following questions with regard to the storing of materials on site.						
	1.4.1	What can materials be placed on if they cannot be stored onto the floor?	directly	(1)			
	1.4.2	Why should heaps of sand and stone be covered with plas	stic?	(1)			
	1.4.3	Why should there be dividing walls to separate sand and	stone?	(1)			
1.5		ate the maximum width of the stacked material if the stack i mm high. (Show calculations.)	S	(2)			
1.6	What i	s the difference between unreinforced concrete and reinforcete?	ced	(1)			
1.7	Name	ONE purpose of coarse aggregate in a concrete mixture.		(1)			
1.8	What t	type of material increases the plasticity of mortar mixtures?		(1)			
1.9	What t	type of material is used as a levelling layer on concrete floor	rs?	(1)			
1.10	Name	the TWO main groups into which wood can be divided.	(2 x 1)	(2)			
1.11	Name ONE use of plywood.						

QUESTION 2: EQUIPMENT, TOOLS AND GRAPHICS (GENERIC)

Start this question on a NEW page.

- 2.1 Why must a spade be oiled lightly when it is not used? (1)
- 2.2 Briefly explain the difference in the uses of the cold chisel and bolster. (2)
- 2.3 Name the tools in FIGURES 2.3.1 to 2.3.3 and name ONE use of each.



(3 x 2) (6)

2.4 Answer the following questions with regard to the tool in FIGURE 2.4.



FIGURE 2.4

- 2.4.1 What is this tool called? (1)
- 2.4.2 Briefly explain how this tool will be used during the installation of a doorframe. (2)
- 2.4.3 Name TWO caring measures of this tool. (2 x 1)
- 2.5 Answer the following questions with regard to the tool in FIGURE 2.5.

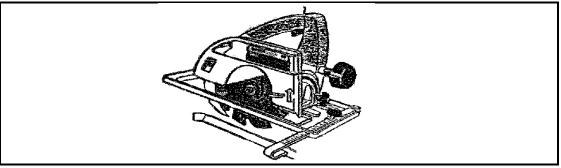


FIGURE 2.5

2.5.1 What is this tool called? (1)

2.5.2 Name TWO uses of this tool. (2 x 1)

2.6 Answer the following questions with regard to the detail drawing in FIGURE 2.6.

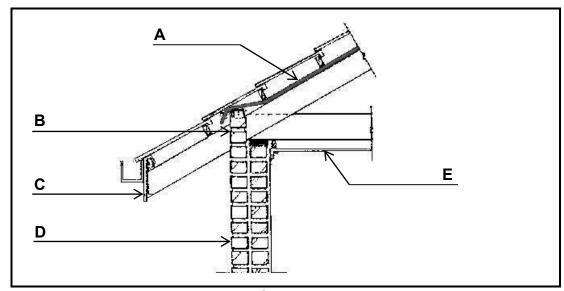


FIGURE 2.6

	2.6.1	Why are detail drawings drawn on an enlarged scale?	(1)			
	2.6.2	Briefly motivate why descriptive notes are included on detail drawings.	(2)			
	2.6.3	Which type of eave construction is illustrated in FIGURE 2.6?	(1)			
	2.6.4	Name parts A to E .	(5)			
	2.6.5	What is the purpose of part B ?	(1)			
	2.6.6	What is the purpose of part C ?	(1)			
2.7	Explain	the purpose of the control test for floor plan dimensions.	(2)			
2.8	•	the position, on the drawing sheet for building plans, where the rrow must be indicated.				
2.9	On whic	ch scale are floor plans usually drawn?	(1)			
2.10	Identify	the following abbreviations on elevations of buildings:				
	2.10.1	NGL	(1)			
	2.10.2	FFL	(1)			
2.11	Make n	eat sketches to illustrate the following symbols on floor plans:				
	2.11.1	Window	(2)			
	2.11.2	Electricity meter	(2)			
	2.11.3	Drain	(1) [40]			

QUESTION 3: JOINING AND GRAPHICS (GENERIC)

Start this question on a NEW page.

3.1 Answer the following questions with regard to the plan elevation in FIGURE 3.1.

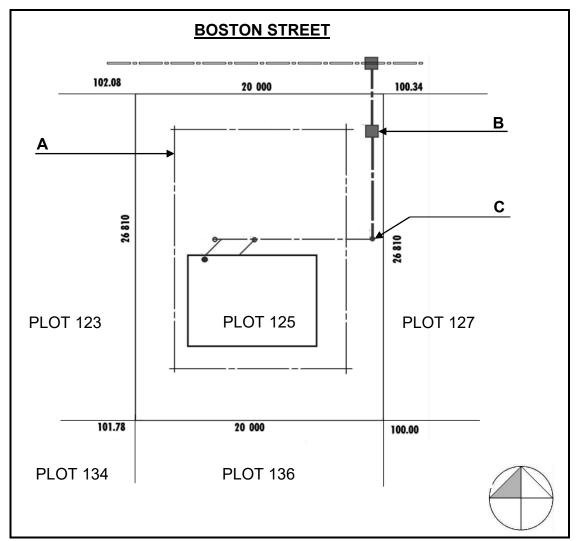


FIGURE 3.1

- 3.1.1 What is the plan elevation called? (1)
- 3.1.2 What is the plot number of the plot at the west side of plot 125? (1)
- 3.1.3 What are the lines at **A** called? (1)
- 3.1.4 Identify the symbols at **B** and **C**. (2×1) (2)

8		CIVIL TECHNOLOGY: WOODWORKING	(EC/NOVEMBER	2020)			
3.2	Name	Name ONE use of PVC glue.					
3.3	Which	adhesive joining material consists of glue?		(1)			
3.4	Make ı	neat sketches to illustrate the following symbols on a floor p	olan:				
	3.4.1	Gully		(2)			
	3.4.2	Earth		(2)			
	3.4.3	Dressed wood		(2)			
3.5	Briefly	describe the application steps of PVA adhesive.	(3 x 1)	(3)			
3.6	Briefly	name THREE precautions when using contact glue.	(3 x 1)	(3)			
3.7	Name	any FIVE uses of silicone.	(5 x 1)	(5)			
3.8	State 7	TWO properties of EACH of the following adhesives:					
	3.8.1	Silicone		(2)			
	3.8.2	Contact glue		(2)			
	3.8.3	PVA glue		(2) [30]			

 (2×1)

(2)

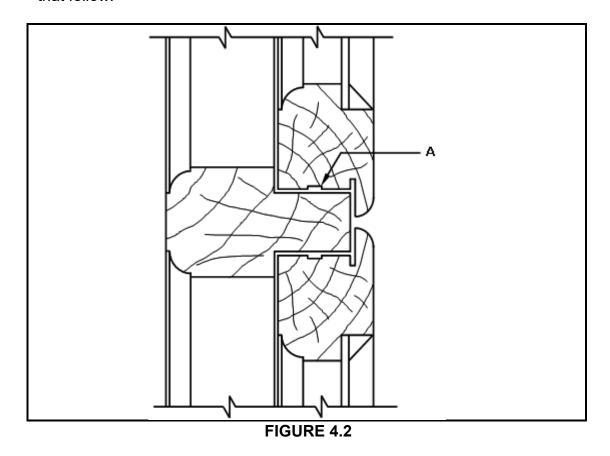
QUESTION 4: CASEMENTS, GRAPHICS, TOOLS AND EQUIPMENT, DOORS AND WALL PANELLING (SPECIFIC)

Start this question on a NEW PAGE.

4.1.10 Show any TWO labels.

4.1	single b	E 4.1 on ANSWER SHEET 1 shows an incomplete section view of a crick wall. Complete the section view on scale 1 : 10 and show the g parts with symbols and labels:	
	4.1.1	A strip foundation of 700 x 250 mm with the invert level of 400 mm	(2)
	4.1.2	A single brick wall with a height of 2 700 mm from the floor level and 10 mm plaster work on the outside and inside	(3)
	4.1.3	The hard core filling of 250 mm	(1)
	4.1.4	The damp proof course	(1)
	4.1.5	The blinding layer of 50 mm	(1)
	4.1.6	The concrete floor slab of 90 mm	(1)
	4.1.7	A door opening with a height of 2 100 mm	(1)
	4.1.8	A concrete lintel with a thickness of 70 mm above the door opening	(1)
	4.1.9	A wall plate of 114 x 38 mm	(1)

4.2 FIGURE 4.2 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.



4.2.1 Name THREE timber parts of the casement.

(3)

4.2.2 Identify A.

(1)

4.3 Use ANSWER SHEET 2 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.

(6)

4.4 Draw a neat drawing in good proportion of the back view of the framed ledged and braced batten door.

(6)

[30]

QUESTION 5: CENTERING, FORMWORK, SHORING AND MATERIALS (SPECIFIC)

Start this question on a NEW page.

5.1 FIGURE 5.1 below shows a horizontal section view through a round column.

Study FIGURE 5.1 and answer the questions that follow.

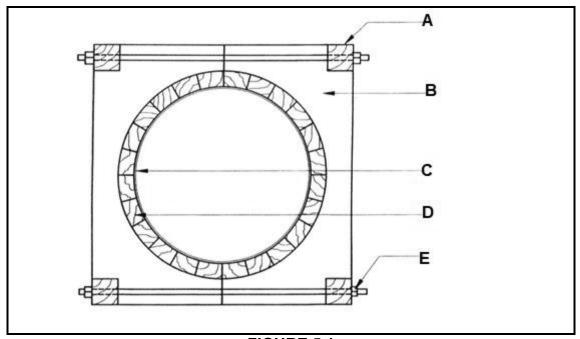


FIGURE 5.1

5.1.1 Identify parts A to D. (4) 5.1.2 Explain the function of **E**. (1) 5.1.3 Briefly explain the disadvantages of formwork. (2×1) (2) 5.1.4 Name TWO advantages of board products that you can use for the sides of formwork. (2) 5.2 Explain ONE use of the following shores: 5.2.1 Raking shore (1) 5.2.2 Single flying shore (1) 5.3 Describe the function of the following components of a raking shore: 5.3.1 Sole plate (1) 5.3.2 Raker/raking strut (1)

5.4 FIGURE 5.4 below shows a left view of the inside detail of the ties, braces and struts.

Study the picture and answer the questions that follow.

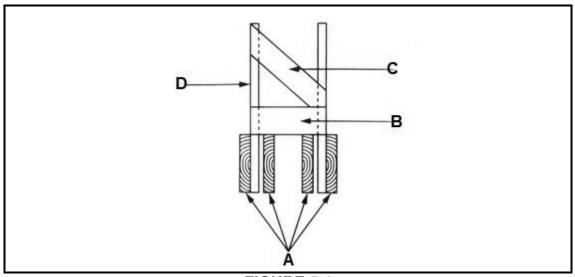


FIGURE 5.4

5.4.1 Identify parts **A** to **D**.

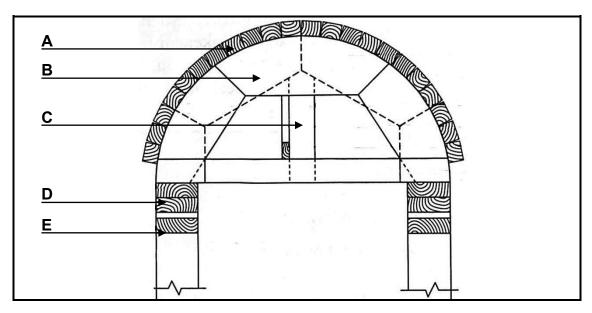
(4)

5.4.2 Explain ONE use of **A** as shown in FIGURE 5.4.

(1)

5.4.3 Explain TWO purposes of part **C**.

- (2)
- 5.5 Draw in your ANSWER BOOK, in good proportion, the front elevation to show the detail of the ties, braces and struts. Label any TWO parts on the drawing. (5)
- 5.6 Name the different parts **A** to **E** of the drawing below.



(5) [**30**]

QUESTION 6: SHORING, JOINING, QUANTITIES, WALL PANELLING, CUPBOARDS AND IRONMONGERY (SPECIFIC)

- 6.1 Indicate if the following statements are TRUE or FALSE. Write only the word 'true' or 'false' next to the number in the ANSWER BOOK.
 - 6.1.1 Shoring is a permanent construction that can be used to support a wall. (1)
 - 6.1.2 Raking shores are used on top of the excavations of foundations to support it. (1)
 - 6.1.3 Flying shores are used to provide support between two walls next to adjacent buildings. (1)
 - 6.1.4 The wall plate provides a supporting surface for the shore and bracing and is fixed to the wall. (1)
- 6.2 Identify the different types of hinges in FIGURES 6.2.A to 6.2.C.

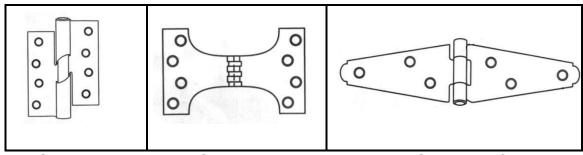


FIGURE 6.2. A FIGURE 6.2. B FIGURE 6.2. C (3)

- 6.3 What is the purpose of cornices in houses? (1)
- 6.4 Calculate the total length of cornice required for a room that is 5 metres long and 3 metres wide on the inside. (4)
- 6.5 Recommend an ironmongery item that you will use for the following instances:
 - 6.5.1 An entrance door that must open 180° to its frame (1)
 - 6.5.2 Added security to doors besides a lock (1)
- 6.6 Use ANSWER SHEET 3 and draw, to scale 1 : 10, the front elevation of a one-panel door. The panels are placed in a 12 mm wide rebate and secured with a bead.

Use the following specifications:

- The door is 2 032 mm high and 813 mm wide
- The top rail and stiles are 114 mm x 44 mm
- The bottom rail is 220 mm x 44 mm
- 16 mm flat plywood panel

Print a title for the door. (6)

- 6.7 Use drawing instruments and draw in your ANSWER BOOK, in good proportion, a sketch of the horizontal section through a 50 mm x 40 mm ground and two 12 mm thick plywood panels to show how the joint is finished with a 12 mm thick cover strip, as used in wall panelling.
- (5)

6.8 List THREE board products that are suitable for wall panelling.

(3)

6.9 A foundation with a length of 28 m, width of 450 mm and a thickness of 150 mm need to be cast with concrete. Calculate the volume of concrete required for the foundation in m³.

(5)

6.10 A cabinet, 800 mm high, 1 000 mm wide and 500 mm deep, is to be fitted between two walls and under a counter.

Use ANSWER SHEET 4 and indicate the following labels on the drawing:

- Base
- Door frame
- Top
- Middle shelf
- · Bottom shelf
- Plywood back

Recommend an alternate material for the back of the cabinet.

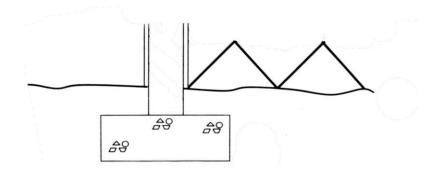
(*1*)

TOTAL: 200

ANSWER SHEET 1	CIVIL TECHNOLOGY WOODWORKING	NAME:	
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4.1

	ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
4.1.1	Strip foundation	2	
4.1.2	Single brick wall	3	
4.1.3	Hardcore filling	1	
4.1.4	DPC	1	
4.1.5	Blinding layer	1	
4.1.6	Concrete floor	1	
4.1.7	Door opening	1	
4.1.8	Concrete lintel	1	
4.1.9	Wall plate	1	
4.1.10	Show labels	2	
	TOTAL:	14	



ANSWER SHEET	2	CIVIL TECHNOLOGY WOODWORKING	NAME:	
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4.3

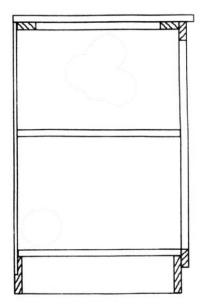
ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Wall	1	
Capping	1	
Rough ground	1	
Tongue and groove board	1	
Correctness of drawing	1	
TOTAL:	5	

ANSWER SHEET	3	CIVIL TECHNOLOGY	NAME:	
ANSWER SHEET	3	WOODWORKING		

6.6 Front view one panel door

CIVIL TECHNOLOGY NAME: 4 **ANSWER SHEET** WOODWORKING

6.10 Cabinet





NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2020

CIVIL TECHNOLOGY: WOODWORKING MARKING GUIDELINE (EXEMPLAR)

MARKS: 200

This marking guideline consists of 15 pages.

QUESTION 1: SAFETY AND MATERIALS (GENERIC)

1.1	Hard hat				
1.2	A tie ca	an get stuck in the moving parts and cause injuries		(1)	
1.3	1.3.1	False		(1)	
	1.3.2	False		(1)	
	1.3.3	True		(1)	
	1.3.4	True		(1)	
1.4	Storing 1.4.1	of materials on site. Any ONE area on which materials can be placed: Shelves Pallets	(1 x 1)	(1)	
	1.4.2	Any ONE reason why heaps of sand and stone be covered plastic: To keep it clean To prevent wash away during rainfalls (Similar answer)	I with (1 x 1)	(1)	
	1.4.3	To prevent the materials from mixing.		(1)	
1.5	1 800 r	$mm \div 3 (1) = 600 mm (1)$		(2)	
1.6	Reinfo	rced concrete contains steel reinforcement bars.		(1)	
1.7	ProvEco	NE purpose of coarse aggregate in a concrete mixture: vides volume stability to the concrete nomical – forms the bulk of the mixture ver the shrinkage potential of the concrete	(1 x 1)	(1)	
1.8	Lime			(1)	
1.9	Screed			(1)	
1.10	Hardw	ood (1) and softwood (1)		(2)	
1.11	BottWalDocCup	NE use of plywood: coms of drawers I panelling or panels booard panels rior balustrades / railings ming	(1 x 1)	(1)	

CIVIL TECHNOLOGY:WOODWORKING

(EC/NOVEMBER 2020)

3

QUESTION 2: EQUIPMENT, TOOLS AND GRAPHICS (GENERIC)

2.1	Prever	Prevent rust. (
2.2		Cold chisel is used to cut holes / grooves in concrete / brickwork / metal (1) Bolster is used to cut tricks (1)					
2.3	Name the tools in FIGURES 2.3.1 to 2.3.3 and name ONE use of each.						
	2.3.1	Pick (1)					
		Any ONE use (1):Loosening hard ground during excavationsBreaking up rock	(2)				
	2.3.2	Block brush (1)					
		Any ONE use (1): • Moistening plaster • Dampening surfaces / concrete	(2)				
	2.3.3	Plane (1)					
		Any ONE use (1): Planing timberSmoothing rough surfaces on timber	(2)				
2.4	2.4.1	Spirit level	(1)				
	2.4.2	(1) Test if the head is horizontal and (2) if the stiles are installed vertically.	(2)				
	2.4.3	Any TWO precautions for the spirit level: • Wipe clean after use • Not allow plaster / cement to dry on it • Store in a dry place (2 x 1)	(2)				
2.5	2.5.1	Portable circular saw	(1)				
	2.5.2	Any TWO uses: • Cutting wood • Cutting other materials with specific blades • Cutting rebates (2 x 1)	(2)				
2.6	2.6.1	To include more information	(1)				
	2.6.2	(1) To highlight details that (2) may not be clearly understood	(2)				
	2.6.3	Open eave	(1)				

	2.6.4	A – DPC (1) B – Beam filling / halfbrick wall (1) C – Facia board / plank (1) D – Singlebrick wall (1) E – Ceiling / cornice (1)	(5)
	2.6.5	Prevents dust / vermin / etc. from entering underneath the roof	(1)
	2.6.6	Fixing gutters	(1)
2.7		re that the horizontal and vertical external measurements (1) and with the individually internal measurements (1)	(2)
2.8	(1) Botto	om on the right-hand side of drawing sheet (1)	(2)
2.9	1:100		(1)
2.10	2.10.1	Natural ground level	(1)
	2.10.2	Finished floor level	(1)
2.11	2.11.1		(2)
	2.11.2	W	(2)
	2.11.3		(1) [40]

QUESTION 3: QUANTITIES, JOINING AND GRAPHICS (GENERIC)

(1)
	((1

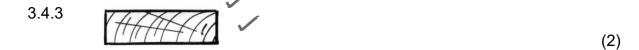
3.1.4 B – Manhole
$$C$$
 – Rodding eye (2)

3.2 ONE use of PVC glue:

3.4 3.4.1



 $\frac{1}{2}$



- 3.5 The application steps for PVA adhesive:
 - (1) Dry-fit parts to make sure the pipes are fitted in the right direction
 - (2) Apply a light coat of PVC glue to the fitting and the pipe
 - (3) Slightly twist and push parts into position (3)
- 3.6 Any THREE precautions when using contact glue:
 - Be careful not to allow the adhesive to dry fully before assembly
 - Do not wait too long before assembling the parts
 - The glue should not be applied too quickly (3 x 1)
- 3.7 Any FIVE uses of silicone:
 - Basic sealant against air and water leakage
 - Textile uses
 - Enhances materials
 - Used in aviation
 - Construction repairs
 - Electronics (5 x 1) (5)

3.8 Any TWO properties of EACH of the following adhesives

3.8.1 Silicone

- Heat resistant
- Conductive or insulating
- Rubbery
- Low heat conductivity
- Resist chemicals / low chemical reaction
- Low toxicity
- Waterproof / repels water

 (2×1) (2)

3.8.2 Contact glue

- Adheres well to most materials (plastics, rubber, paper, wood, etc.)
- Sticks to most non-porous materials
- Rubbery and has a creamy colour
- Flammable
- Water-resistant
- Dries quickly and adheres / sticks immediately

 (2×1) (2)

3.8.3 PVA glue

- Water-based
- For interior and exterior use
- White or yellowish colour before it dries, clear when dry
- Yellow PVA is not completely clear on drying
- Super strong when used on wood
- Dries quickly

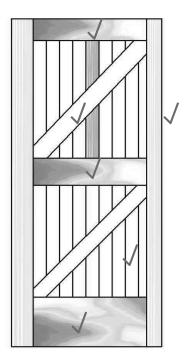
Inexpensive

 (2×1) (2)

[30]

QUESTION 4: CASEMENTS, GRAPHICS, TOOLS AND EQUIPMENT, DOORS AND WALL PANELLING (SPECIFIC)

- 4.1 ANSWER SHEET 1 (14)
- 4.2 4.2.1 Transom ✓
 - Bottom rail of fanlight ✓
 - Top rail of casement ✓ (3)
 - 4.2.2 Dripgroove ✓ (1)
- 4.3 ANSWER SHEET 2 (6)
- 4.4 Framed ledged and braced batten door

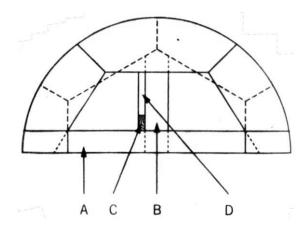


(6) **[30]**

QUESTION 5: CENTERING, FORMWORK, SHORING AND MATERIALS (SPECIFIC)

5.1 5.1.1 A – Vertical clamps B -Yoke or collar D – Laggings C – Plywood (4) 5.1.2 To hold the formwork in place or to tighten the formwork (1) 5.1.3 Can't be used for long • If timber is dry, it will absorb moisture from the wet concrete which could weaken the resultant concrete member • Wet concrete will shrink and cup leading to open joints and leakage (2×1) (2) 5.1.4 Manufactured in big boards Makes it ideal for the sides of formwork because it can be cut into different sizes (2) 5.2 5.2.1 Are placed at an angle against walls to provide temporary support To support leaning or unstable walls • Transferring weight to the ground or to other supporting members (Any 1) (1) 5.2.2 Temporary horizontal support to two parallel walls Where one of the walls tends to lean or show signs of failure Between gable walls of adjacent buildings when an intermediate building must be demolished or work has to be done on the foundations of an adjacent building (Any 1) (1) 5.3 5.3.1 It receives the load that is transferred both vertically and horizontally and distributes it into the ground. (1) 5.3.2 Transfers the horizontal and vertical load exerted on the wall plate to the sole plate. (1) 5.4 5.4.1 A - Ties B - Horizontal brace C – Diagonal brace D – Strut (4) 5.4.2 To prevent the opposite ends of the ribs from moving apart under the weight of the arch. (1) 5.4.3 To join the outside and inside ribs Keeps the centre square and increases its rigidity (2)

5.5



A – Tie B – Strut C – Horizontal brace D – Diagonal brace (Any 2) (5)

5.6 A – Laggings

B – Rib

C – Strut D – Tie

E – Bearer

(5) [30]

QUESTION 6: SHORING, JOINING, QUANTITIES, WALL PANELLING, CUPBOARDS AND IRONMONGERY (SPECIFIC)

6.1 6.1.1 False (1) 6.1.2 False (1) 6.1.3 True (1) 6.1.4 True (1) 6.2 6.2.1 A – Rising butt hinge (1) 6.2.2 B – Parliament hinge (1) 6.2.3 C - Strap hinge (1) 6.3 It is there to cover the joint between the wall and the ceiling (1) 6.4 Cornice for long walls $= 2 \times 5 \text{ m} = 10 \text{ m}$ Cornice for short walls $= 2 \times 3 \text{ m} = 6 \text{ m}$ Total length of cornices = 10 + 6 = 16 m(4) 6.5 6.5.1 Parliament hinge (1) 6.5.2 Flush bolts or barrel bolts (1) 6.6 **ANSWER SHEET 3** (6)6.7 (Any part x 1) (5) 6.8 Plywood Block board Hardboard/Masonite (3) 6.9 Volume of concrete = $\ell x b x h$ = 28 m x 0.45 m x 0.15 m $= 1.89 \text{ m}^3$ (5)

TOTAAL: 200

(7) **[40]**

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ANSWER SHEET 4

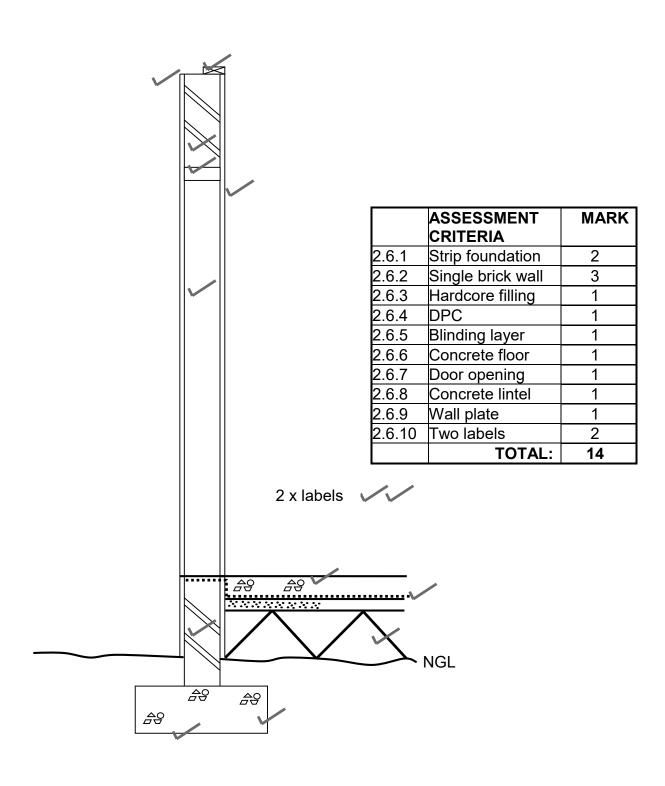
6.10

ANSWER SHEET

CIVIL TECHNOLOGY WOODWORK

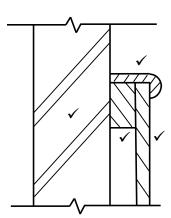
NAME:

4.1



ANSWER SHEET 2	CIVIL TECHNOLOGY WOODWORKING	NAME:
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4.3



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

(5)

Correctness ✓

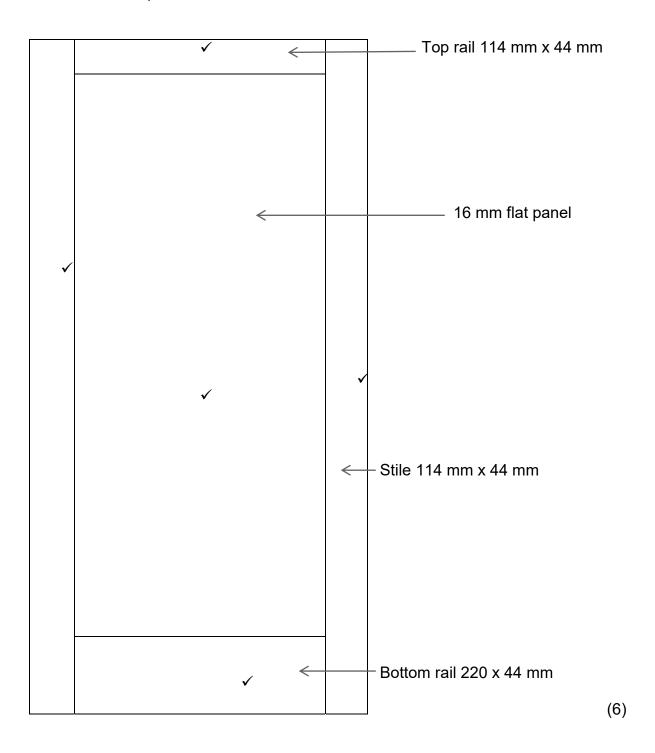
ANSWER SHEET

CIVIL TECHNOLOGY WOODWORKING

NAME:

6.6 Front view one panel door

3



ANSWER SHEET 4 CIVIL TECHNOLOGY WOODWORKING NAME:

6.10 Cabinet

