



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

CIVIL TECHNOLOGY

EXEMPLAR 2017

MEMORANDUM

MARKS: 200

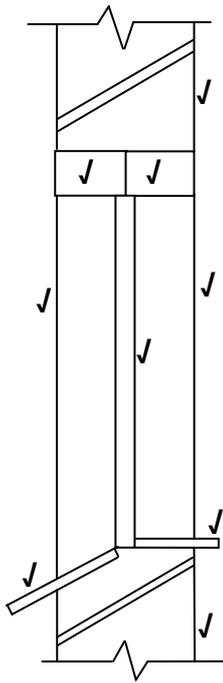
This memorandum consists of 34 pages.

SECTION A: GENERIC (COMPULSORY)**QUESTION 1: SAFETY, MATERIALS AND SUBSTANCE ABUSE**

- 1.1 1.1.1 H ✓
 1.1.2 G ✓
 1.1.3 F ✓
 1.1.4 E ✓
 1.1.5 M ✓
 1.1.6 I ✓
 1.1.7 J ✓
 1.1.8 C ✓
 1.1.9 D ✓
 1.1.10 A ✓ (10)
- 1.2 • Plywood ✓
 • Block board ✓
 • Hardboard/Masonite ✓ (3)
- 1,3 • No stack should be higher than three times its width. ✓
 • Stacks should be linked or interlinked. ✓
 • Materials should only be stacked on firm, strong flooring. ✓
 • Position the stack that there is no protruding parts.
 • Stacks should not affect ventilation, lighting or the use of fire fighting equipment
 • Any stack that appears unstable should immediately be restacked.
ANY THREE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER (3)
- 1.4 Ferrous metals: Main ingredient is iron. ✓
 Non-ferrous metals: Contains no or little iron. ✓ (2)
- 1.5 • Loss of consciousness or semi-consciousness ✓
 • Slow respiratory levels ✓
 • Cold, clammy, pale or blue skin
 • Negligence
 • Lower productivity
 • Loss of interest in work
 • Troublesome behaviour
 • Interference with other workers on site
ANY TWO OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER (2)
- 1.6 Hazardous material must be stored in a safe, separate room because it may ignite easily and chemicals may react with one another. ✓ (1)
- 1.7 • River sand ✓
 • Cement ✓
 • Stone/Coarse aggregates) ✓ (3)

- 1.8
- Reacts with the cement to start the hydration process (chemical reaction) ✓
 - Forms a paste so that it binds the aggregates and cement together ✓
 - Reacts with cement to give strength
 - Ratio of water to cement should be balanced – too much water will reduce strength and too little will make concrete unworkable
 - Cleans tools and equipment used for brickwork
 - Applied to concrete during the curing period
- (2)
- 1.9
- 1.9.1
- Used to create a smooth, level surface on a concrete floor ✓
 - Used as a level layer of covering
 - Suitable for light-duty use if the floor is not covered
- ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER**
- (1)
- 1.9.2
- Used on the inside of formwork for a smooth finish of concrete ✓
 - Used for bottoms of drawers
 - Used for wall/door and cupboard panels
- ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER**
- (1)
- 1.9.3
- Window frames ✓
 - Sliding doors
 - Roof sheets
 - Gutters
 - Downpipes
 - Door handles for doors
- ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER**
- (1)
- 1.10
- Abstain from intercourse ✓
 - Have less risky sex
 - Use condoms
 - Limit your sexual partners
 - Get tested and treated
 - Do not inject yourself with drugs
- ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER**
- (1)
[30]

2.4



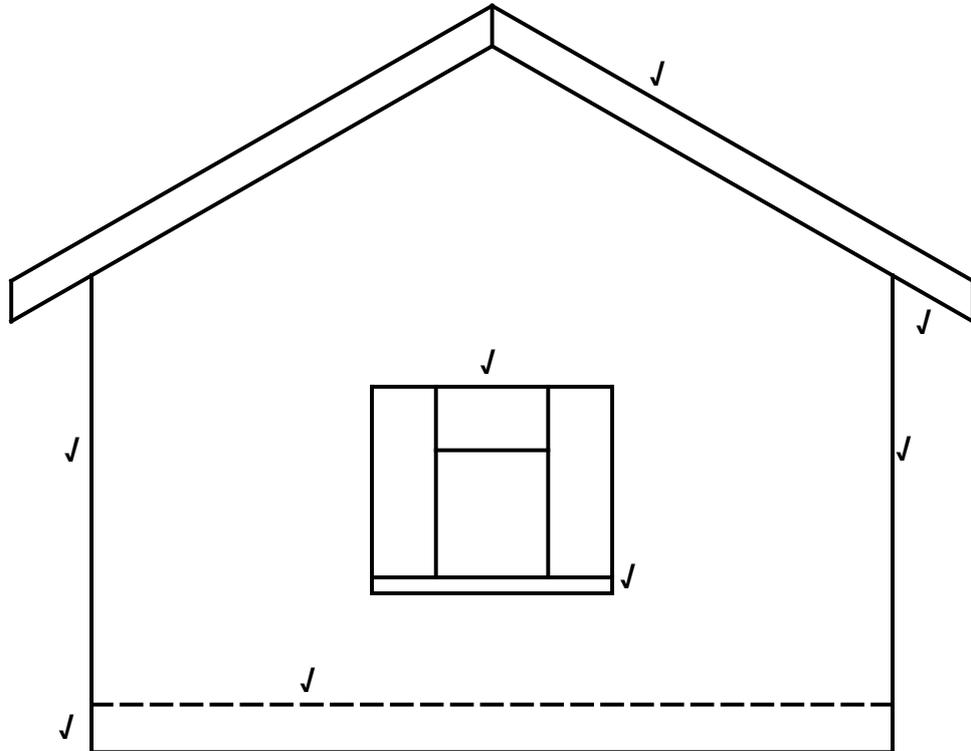
ASSESSMENT CRITERIA	MARKS	LEARNER'S MARK
Wall above window	1	
Wall below window	1	
Lintels	2	
Window frame	1	
External window sill	1	
Internal window sill	1	
Reveals	2	
TOTAL	9	

(9)

- 2.5 2.5.1 A- Door ✓
- B- Window ✓
- C- North point ✓

(3)

2.5.2



ASSESSMENT CRITERIA	MARKS	LEARNER'S MARK
External walls	2	
Natural ground level	1	
Finished floor level	1	
Window	1	
Window sill	1	
Barge board	1	
Verge overhang	1	
TOTAL	8	

NOT TO SCALE: USE A MASK TO MARK THIS QUESTION.

(8)
[40]

QUESTION 3: QUANTITIES AND JOINING

3.1 3.1.1 Length x breadth – $l \times b \checkmark$ (1)

3.1.2 Length x breadth x height – $l \times b \times h \checkmark$ (1)

3.2 linear metre (1)

3.3 Volume of concrete = $l \times b \times h$
 $= 28 \text{ m} \times 0,45 \text{ m} \checkmark \times 0,15 \text{ m} \checkmark$
 $= 1,89 \checkmark \text{ m}^3 \checkmark$ (4)

3.4

3.4.1

A	B	C	D
			Centre line of wall:
			$2/8 \ 440 = 16 \ 880 \text{ mm} \checkmark$
			$2/6 \ 440 = 12 \ 880 \text{ mm} \checkmark$ <input type="checkbox"/>
			$= 29 \ 760 \text{ mm} \checkmark$
			Minus $4/220 = 880 \text{ mm} \checkmark$
			Total length of centre line = $28 \ 880 \text{ mm} = 28,88 \text{ m} \checkmark$

(5)

3.4.2

			Area of walls before deductions
1/	28,88		Centre line of wall = 28,88 m
	<u>2,7</u> \checkmark	$77,97 \text{ m}^2 \checkmark$	Height of wall = 2,7 m
			Area of door
1	2,1		Door opening is 2 100 mm x 900 mm
	<u>0,9</u> \checkmark	$1,89 \text{ m}^2 \checkmark$	
			Area of window
1	2.0		Window opening is 2 000 mm x 1 200 mm
	1,2 \checkmark	$2,4 \text{ m}^2 \checkmark$	
			Area of walls after deductions
			Area of walls – area of window – area of door
			$77,97 \text{ m}^2 - 1,89 \text{ m}^2 - 2,4 \text{ m}^2$
			$= 73,68 \text{ m}^2 \checkmark$
			Area of walls after deductions
2/	$73,68 \text{ m}^2 \checkmark$		Number of bricks required <input type="checkbox"/>
	50 \checkmark	7 368 bricks \checkmark	50 bricks per m^2 for a half-brick wall

(1)

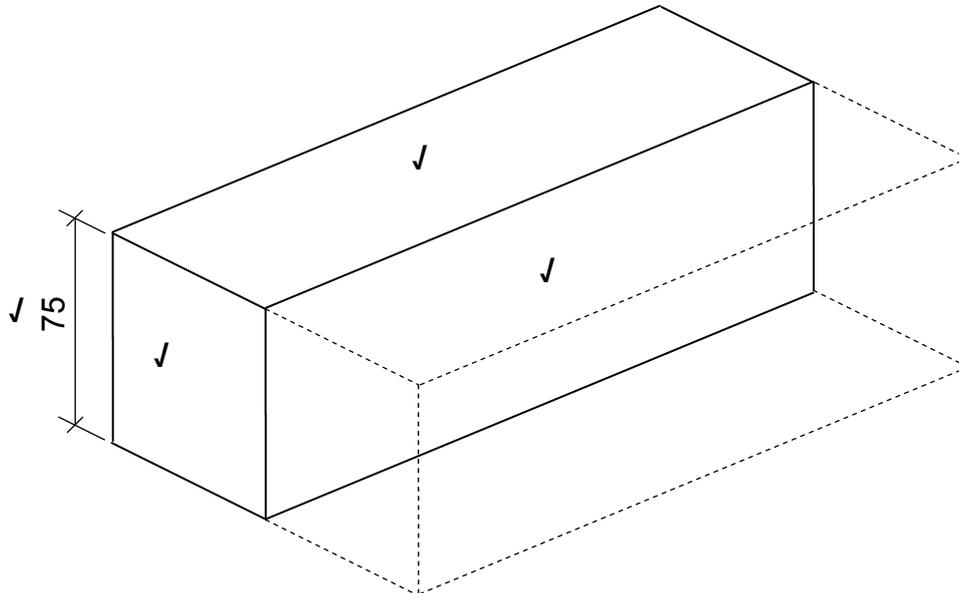
(3)

3.5	3.5.1	Timber	(1)
	3.5.2	Epoxy	(1)
	3.5.3	Water	(1)
	3.5.4	Contact	(1)
	3.5.5	PVC adhesives	(1)
3.6	3.6.1	<ul style="list-style-type: none"> • Adheres well to most materials, e.g. plastics, rubber, paper, particle board, wood, etc. ✓ • Sticks to most non-porous materials • Rubbery and has a creamy colour • Flexible, yet keeps bonded surfaces together • Flammable • Water-resistant • Dries quickly and can bond immediately <p>ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER.</p>	(1)
	3.6.2	<ul style="list-style-type: none"> • Water-based ✓ • For interior or 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 <p>ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER</p>	(1)
	3.6.3	<ul style="list-style-type: none"> • Heat resistant ✓ • Conductive or insulating • Rubbery • Low heat conductivity • Resist chemicals/low chemical reactivation • Low toxicity • Forms waterproof joints because it repels water • Excellent to use in electrical connection because of its insulating properties • May exhibit defoaming/anti-foaming properties <p>ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER</p>	(1)
			[30]

TOTAL SECTION A: 100

SECTION B: CONSTRUCTION**QUESTION 4: EXCAVATIONS AND FOUNDATIONS**

4.1



ASSESSMENT CRITERIA	MARKS	LEARNER'S MARK
Front view	1	
Top view	1	
Left view	1	
One dimension	1	
Application of scale 1 : 2	1	
TOTAL:	5	

NOT TO SCALE: USE A MASK TO MARK THIS QUESTION.

(5)

4.2

- Security gates ✓
- Fences ✓
- Water pipes ✓

(2)

4.3

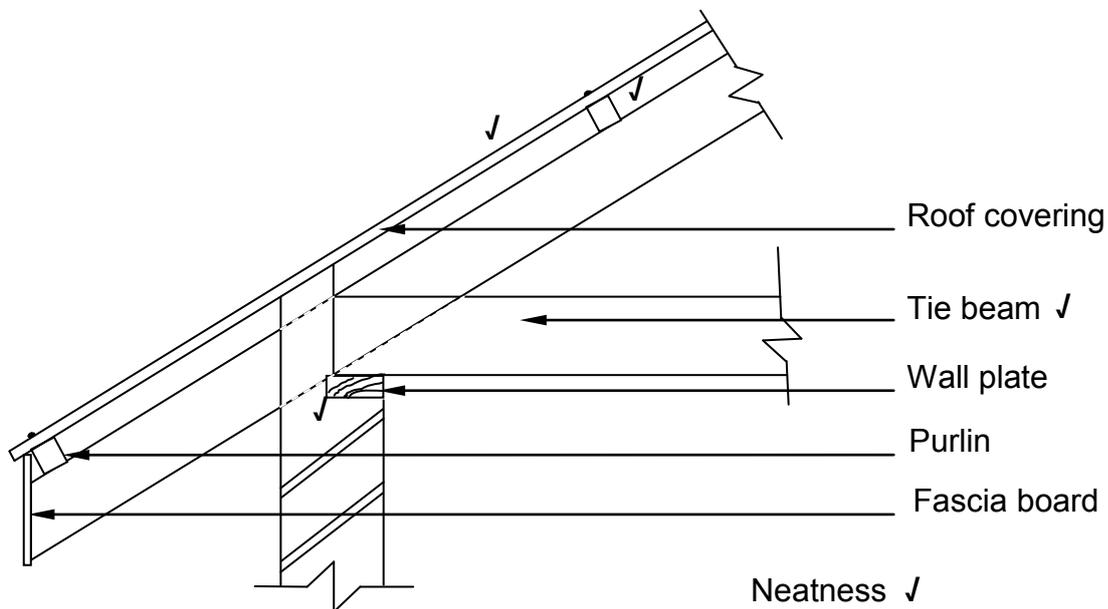
MATERIAL	COLOUR	USE
Copper	Reddish ✓	Water pipes ✓ Electrical wiring Electrical conductors Decorative articles Tubing Hot-water pipes and fittings Flashings
Lead	White/Silver ✓	Solder ✓ Plumbing Casting of sculptures Roof flashings

(4)

- 4.4 4.4.1
- Safety shoes ✓
 - Ear protection ✓
 - Safety goggles
 - Hard hat
 - Gloves
 - Overall
- ANY TWO OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER** (2)

- 4.4.2
- Compacting displaced and loose soil ✓
 - Tamping fillings for a hard-core layer underneath concrete floors ✓
- (2)

4.5



ASSESSMENT CRITERIA	MARK	LEARNER'S MARK
Any correct labels	1	
Roof covering drawn correctly	1	
Wall plate drawn correctly	1	
Purlin drawn correctly	1	
Neatness	1	
TOTAL:	5	

(5)

- 4.6 4.6.1
- Area of wall = $l \times b$
 = $2 \text{ m} \times 15 \text{ m}$ ✓
 = 30 m^2 ✓
- (2)

- 4.6.2
- Total number of bricks = 30×100 ✓
 = 3 000 bricks ✓
- (2)

- 4.7
- In situ cast-concrete suspended floor ✓
 - Rib and block floor
 - Hollow-core pre-cast floor slabs
- (2)
- 4.8
- Excavated earth on the edge of a trench may cause the sides to collapse ✓
 - Poor soil conditions (precautions should be taken in respect of poor soil) ✓
 - Buildings, utilities or heavy traffic routes nearby and any source of vibration may cause sides of trenches to collapse.
 - Whether the ground was disturbed before
 - Nearness of streams, old sewers and underground cables
 - The availability of adequate equipment, protective gear, shoring materials and warning signs and lights
- ANY TWO OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER**
- (2)
- 4.9
- 4.9.1 Pad foundations are generally used to transfer loads from a column, pier or heavy machinery to the ground. ✓
- (1)
- 4.9.2 These piles are frequently used to counter ground movement (the expanding and contraction of clay soil)
- (1)
- [30]**

QUESTION 5: FORMWORK, CONSTRUCTION STEEL AND CAVITY WALLS

- 5.1
- Always hold the power float by the handles provided ✓
 - Wear suitable clothing, avoid loose garments
 - Wear protective gloves and foot wear
 - Driving and rotating parts should be covered
- ANY TWO OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER** (2)

- 5.2
- Use in well-ventilated areas ✓
 - Keep open flames away from it
 - Use safety goggles to protect your eyes
 - Use safety gloves to protect your hands
 - Use a respiratory mask
- ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER** (1)

5.3

5.3.1

A	B	C	D
			Length of lintel needed above the door opening
			Width of door = 900 mm
			Length of lintel = opening + 2(overhang)
			= 900 mm + 2(150) mm ✓
			= 1 200 mm ✓

(2)

5.3.2

			Internal measurements of the interior walls
			Internal length of long walls = 10 400 mm – 2/220 mm
			= 9 960 mm ✓
			Internal length of short walls = 4 400 mm – 2/220 mm
			= 3 960 mm ✓
			Area of floor covering needed
1/	9,96 m ² ✓		Internal length of long wall = 9 960 mm
	3,96 m ² ✓	39,44 m ² ✓	Internal length of short wall = 3 960 mm

(3)

- 5.4
- 5.4.1
- A- H-beam ✓
 - B- I-beam ✓
 - C- Channel iron ✓
- (3)

5.4.2 **H-beam**

Used:

- In construction and civil engineering where structures require good stability ✓
- For bridges
- For shipbuilding
- For conveying machinery
- As columns or beams when steel constructions are erected

(1)

I-beam

Used:

- As beams when steel structures are erected ✓
- When building factories.
- For shipbuilding
- For bridge building
- For framed structures

(1)

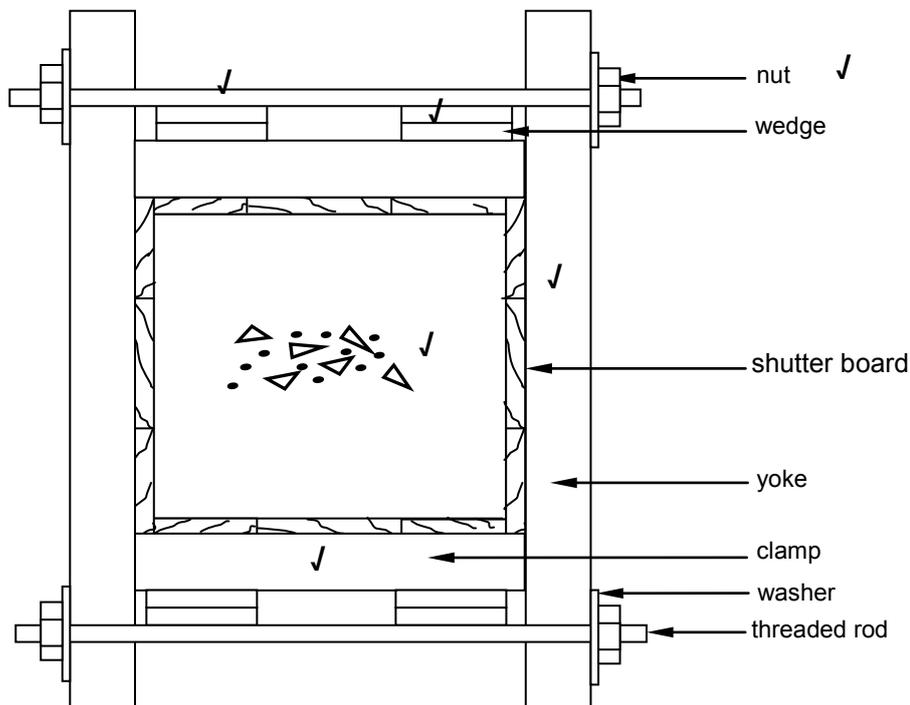
Channel iron

Used:

- In the construction industry ✓
- Frames of steel structures
- Columns
- Beams
- Roof structures

(1)

5.5



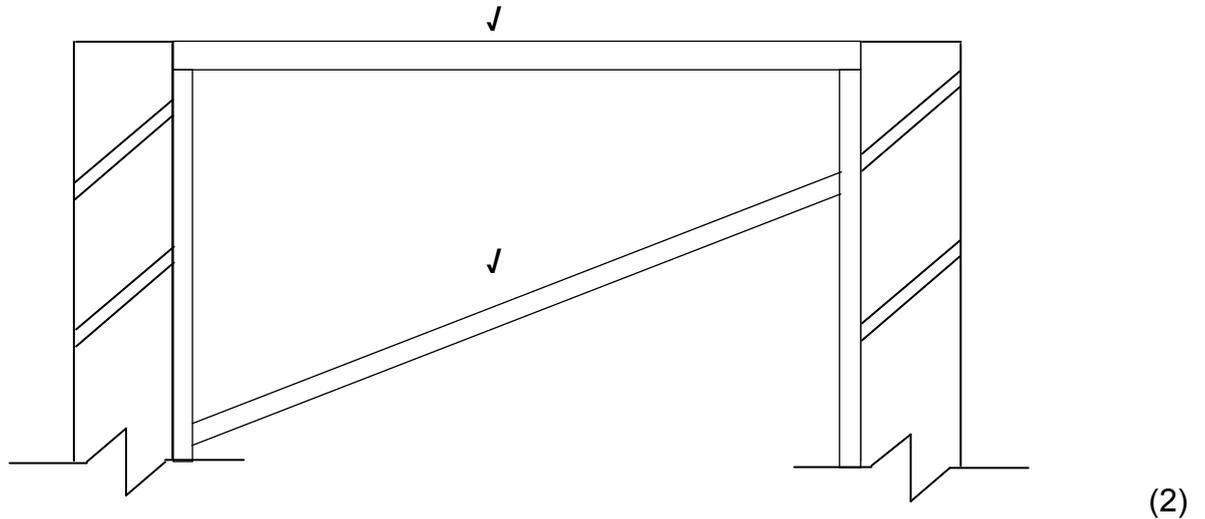
ASSESSMENT CRITERIA	
16 mm Ø threaded rod	1
Yokes	1
Clamps	1
Wedges	1
Labels	1
Application of scale	1
TOTAL	6

(6)

5.6 5.6.1 Portable vibrator (poker and drive unit) (1)

- 5.6.2
- A spare concrete vibrator should be on standby ✓ (1)
 - Hand compaction is an alternative option

5.7



- 5.8
- A- Butterfly pattern ✓ (2)
 - B- Double triangle pattern ✓

- 5.9
- The walls must be connected using wall ties that are set 900 mm horizontally ✓
 - 450 mm vertically apart, as closely as possible to any opening ✓
 - Must also be placed at 300 mm intervals along the junctions and openings of the wall

(2)
[30]

QUESTION 6: BRICKWORK, STAIRCASES AND ROOFCOVERING**CONSTRUCTION**

- 6.1
- Safety goggles ✓
 - Overall ✓
 - Safety gloves
 - Safety shoes
 - Dust mask
- (2)
- 6.2
- Component ✓
 - Number ✓
 - Unit ✓
 - Length
 - Breadth
 - Thickness
 - Subtotal
 - Total
 - Material
- ANY THREE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER**
- (3)
- 6.3
- Timber window frames can be joined into brickwork with steel ties. ✓
 - Long nails can also be hammered into the sides of the stiles. ✓
 - Metal straps, lugs and screws can also be used to join frames to a wall.
- ANY TWO OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER**
- (2)
- 6.4
- Claw hammer ✓
 - Cross-cut saw ✓
 - Tape measure ✓
 - Square
 - Shifting spanner
 - Spanners
- ANY THREE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER**
- (3)
- 6.5
- Wire nail ✓
- (1)

6.6

ASSESSMENT CRITERIA		LM
Header course	2	
Stretcher course	2	
Queen closer	1	
Proportion and line work	2	
Label: Header	1	
Label: Queen closer	1	
TOTAL	9	

LM = Learner's mark

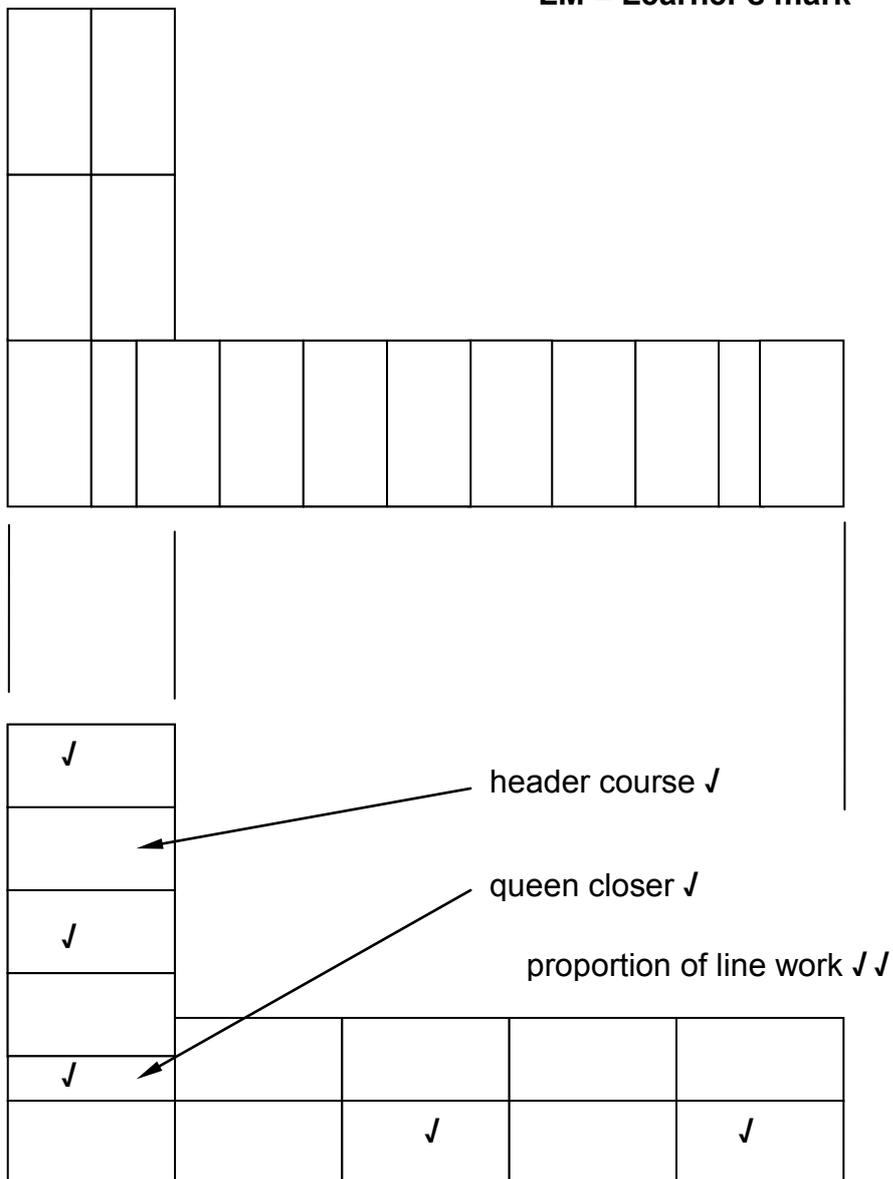
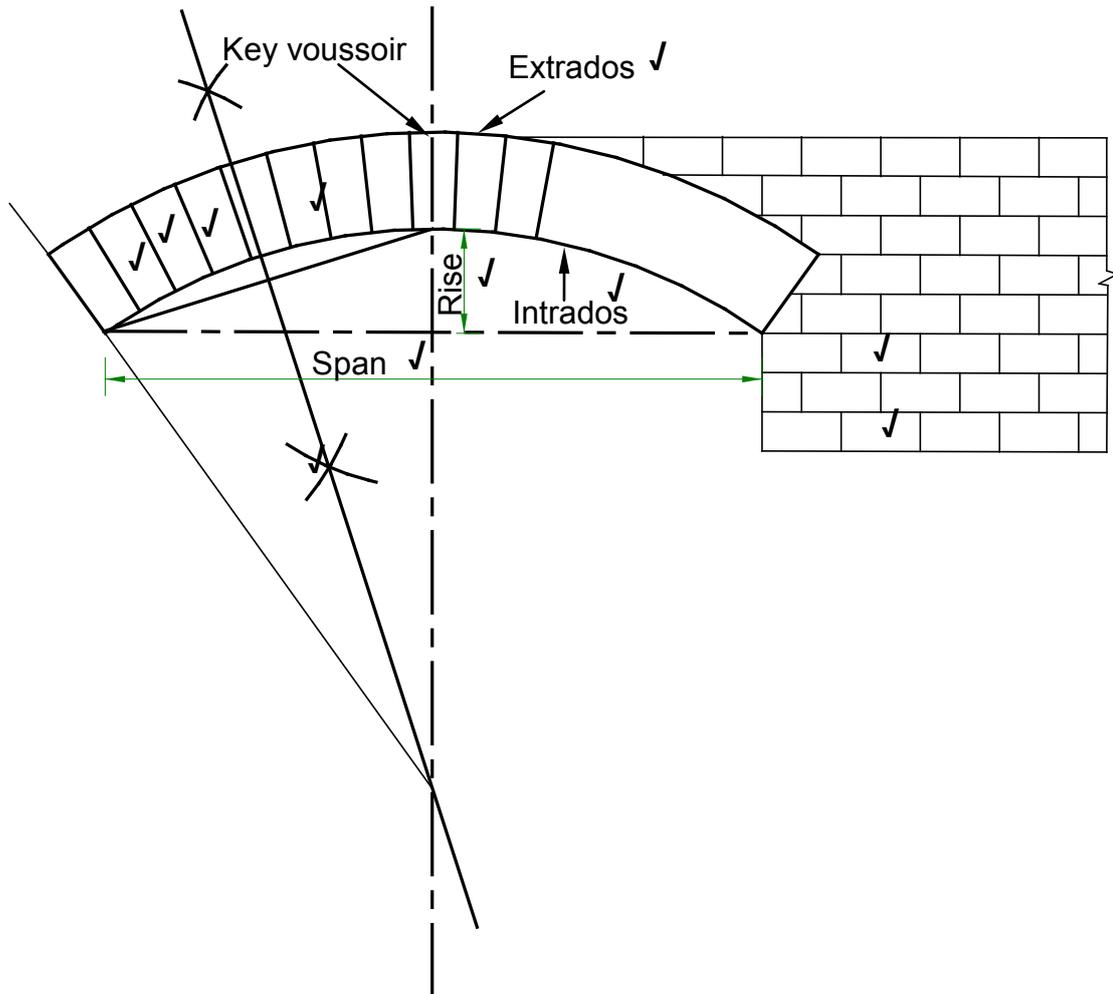


FIGURE 6.6

(9)

- 6.7 6.7.1 Rise (1)
- 6.7.2 75–200 mm (1)
- 6.7.3 Stringer (1)
- 6.7.4 Tread/Going (1)
- 6.7.5  (2)
- 6.8 The purpose of roof covering is to:
- Resist weather conditions, such as wind and rain ✓
 - Keep heat, rain and cold out of the house ✓
 - Provide shade from direct sunlight
 - Keep the interior of the house cool
 - Provide the occupants with security as well as privacy
 - Prevent birds, insects and rodents from entering the house
 - Enhance the appearance of the building
- ANY TWO OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER** (2)
- 6.9 • Corrugated iron roof sheeting ✓
- IBR (Inverted box rib) ✓ (2)

6.10



1 mark will be given if voussoirs are vertical lines.

ASSESSMENT CRITERIA	MARKS	LEARNER'S MARK
Voussoirs	3	
Key voussoir	1	
Surrounding brickwork	2	
Rise (indicate and label)	1	
Span (indicate and label)	1	
Intrados (indicate and label)	1	
Extrados (indicate and label)	1	
TOTAL	10	

(10)
[40]

TOTAL SECTION B: 100

SECTION C: CIVIL SERVICES**QUESTION 7: CONSTRUCTION IN CIVIL SERVICES, COLD-WATER AND HOT-WATER SUPPLY**

7.1 Placing of concrete refers to the pouring ✓, pumping ✓ or spraying of concrete into place. (2)

7.2

- Mechanical compacting (poker and drive unit) ✓
- Hand compaction ✓

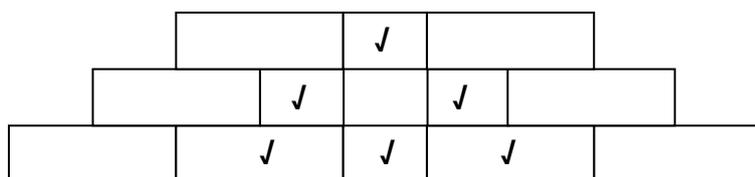
(2)

7.3

- To protect it from drying out too quickly. ✓
- To ensure that there is sufficient water in the concrete for the hydration process to continue to ensure that the concrete reaches its specified strength.

(1)

7.4



(6)

7.5 7.5.1 Vacuum breaker ✓ (1)

7.5.2 Brass ✓ (1)

7.5.3 2 ✓ (1)

7.5.4 Copper ✓ (1)

7.5.5 1 ✓ (1)

7.6

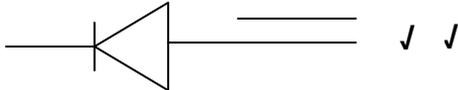
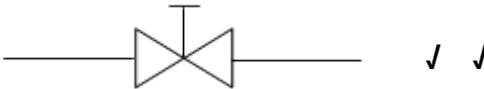
- Rust resistant ✓
- Easy to bend
- Strong
- Does not fade in sunlight
- Easily and solidly joined using a soldered coupling
- Bacteria cannot grow in copper pipes
- Extremely durable

(1)

7.7

- Sharp objects can penetrate the pipe ✓
- Constitutes a high fire hazard if it catches fire
- Cannot stack more than FIVE coils on top of each other
- Must be stored in the shadiest place on site
- If stacked incorrectly, the bottom coils may be damaged
- Cannot be thrown from a delivery vehicle
- Rodents and animals can easily damage the pipes

(1)

- 7.8 A compression fitting ✓ will be the best option because it will be very difficult to solder a joint where the water cools down the copper because it cannot be totally shut off. (1)
- 7.9 7.9.1 Full-way valve/Gate valve ✓ (1)
- 7.9.2 A- Hand wheel ✓
B- Gland nut ✓
C- Valve body ✓ (3)
- 7.10
- A drip tray has been compulsory since June 2001; it must be connected to a 50 mm drain pipe. ✓
 - Vacuum breakers must be installed. 300 mm copper pipes above the geyser. ✓
 - The temperature and the pressure safety valve must have a steel or a copper pipe connected to it. The pressure rating of this valve MUST match the pressure rating of the geyser.
 - The weight of the geyser must be supported by the roof trusses and the geyser should have at least two legs.
 - An electric isolator switch should be installed at least 1 metre from the geyser. The geyser must be earthed.
 - There should be a cover over the thermostat and the element.
 - The geyser inlet and outlet pipes should be lagged.
 - The geyser must be SABS approved.
- ANY TWO OF THE ABOVE** (2)
- 7.11 7.11
- 
- (2)
- 7.1.2
- 
- (2)
- 7.12
- Safety hazard as the tubes can explode due to extra heat that cannot be pumped out in time ✓
 - Low working ability because of less solar energy
 - No guarantee that the water will be hot at all times
 - Damage due to boiling conditions
 - Corrosion of the components
 - Initially requires high capital investment
 - If one glass tube breaks, the system must be shut down
- ANY ONE OF THE ABOVE** (1)

[30]

QUESTION 8: GRAPHICS, ROOF WORK AND STORM WATER.

- 8.1
- Never touch the element of a soldering iron as it is hot (it can burn you). ✓
 - The cleaning sponge must be kept wet while you are soldering. ✓
 - Always return the soldering iron to its holder or stand.
 - Never put the hot iron on the work bench.
 - When working with flux and solder, wear eye protection (solder can splash or splatter).
 - Cleaning solvents must be kept in a bottle to prevent inhalation.
 - Work in a well-ventilated area as lead can give off fumes during soldering; a mask can therefore be worn if preferred.
 - Avoid breathing in the fumes by keeping your head to one side of the work instead of directly above the work.

ANY TWO OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER FOR EACH

(2)

- 8.2
- Used to join/solder two pieces of metal or pipes together ✓
 - To cover the tip of the soldering iron with a thin layer of tin or solder ✓

(2)

- 8.3
- Floor tiles ✓
 - Wall tiles
 - Baths, washbasins and water closets
 - Where materials are needed that require resistance against high temperatures

(1)

- 8.4
- 8.4.1
- A- Pop rivet gun ✓ (1)
 - B- Grooving tool ✓ (1)
 - C- Sheet-bending machine ✓/Box and pan bending machine (1)

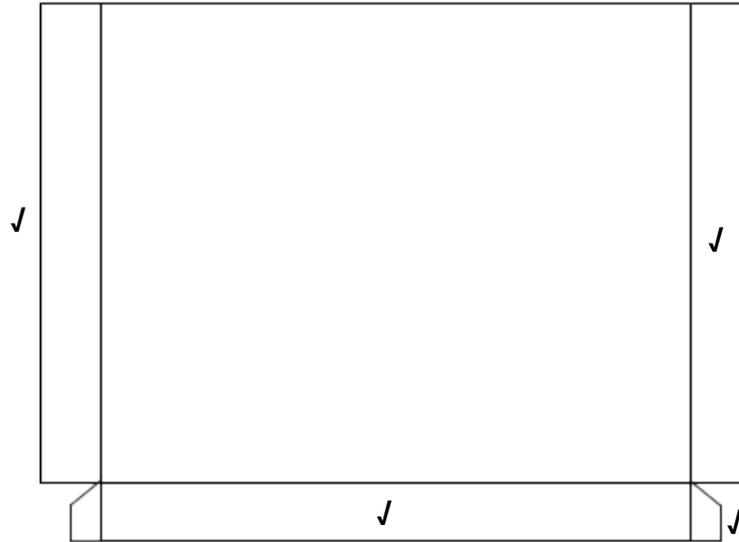
- 8.4.2
- A- Securing rivet pins in thin sheets/sheet metal ✓ (1)
 - B- Straightening a rolled seam joint ✓ (1)
 - C- Bending sheet metal to specific shapes/specifications ✓ (1)

8.5



(2)

8.6



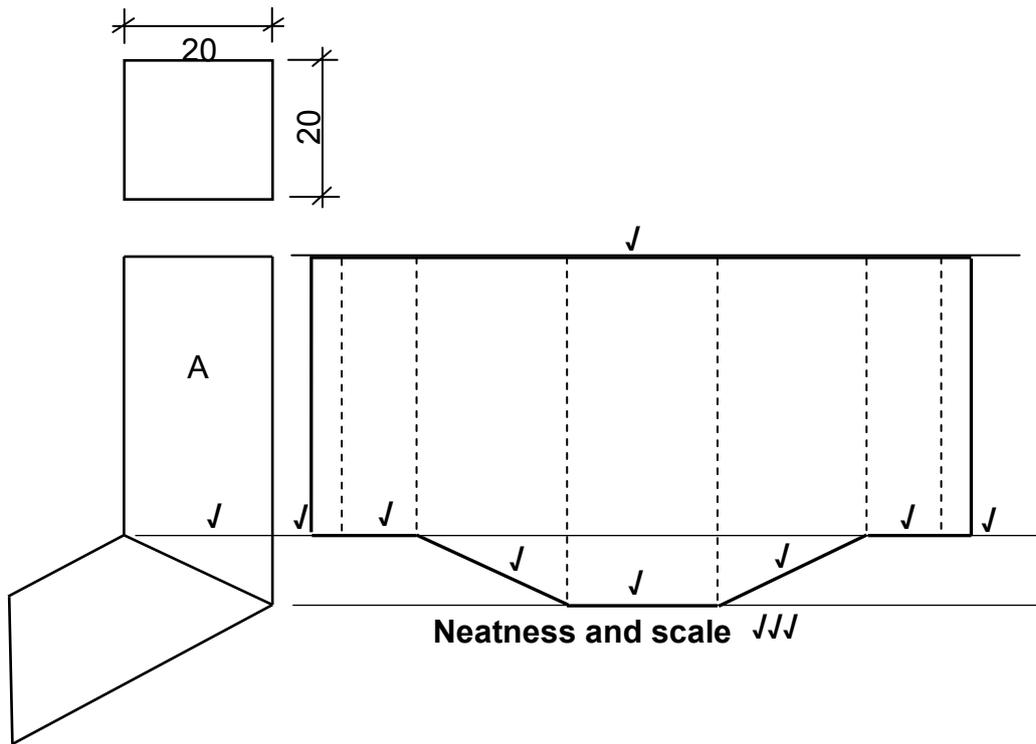
(4)

8.7

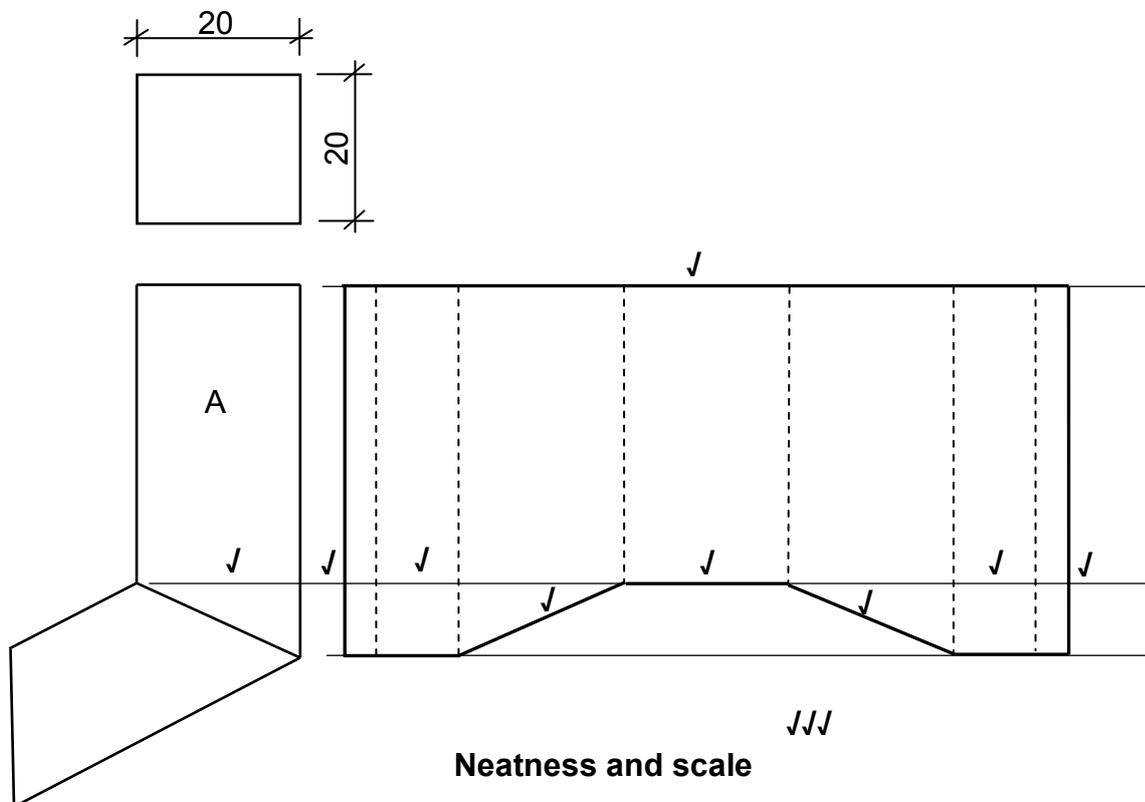
Storm water is a large quantity of run-off water from rain, hail and/or snow that flows over the ground and has to be carried away to prevent flooding or dangerous pooling. ✓

(1)

8.8



OR

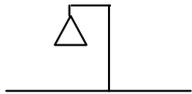


NOT TO SCALE: USE A MASK TO MARK THIS QUESTION.

(12)
[30]

QUESTION 9: DRAINAGE (SEWERAGE) AND SANITARY FITMENTS.

- 9.1
- Always wear rubber gloves and rubber boots when working with raw sewage. ✓
 - Always wear a respiratory mask when working with raw sewage to prevent inhalation of germs. ✓
 - Wash your hands with soap and disinfectant after working with raw sewage.
 - Always cover open wounds and cuts with appropriate plaster to prevent contact with bacteria and germs.
 - Always disinfect the area where raw sewage was spilled with a suitable disinfectant to prevent infections to people that may cross that area.
 - Never smoke or use open flames in confined areas where raw sewage is present. (2)
- 9.2
- Half round file ✓ (1)
- Flat file (1)
- 9.3
- 9.3.1 Water closet ✓ (1)
- 9.3.2 Ceramic ✓ (1)
- 9.3.3 Gully ✓ (1)
- 9.3.4 Rodding eye ✓ (1)
- 9.3.5 2 ✓ (1)
- 9.3.6 190 mm x 100 mm ✓ = 19 000 mm = 19 m ✓ (tolerance of 1 m to either side) (2)
- 9.4
- Dry-fit parts first to make sure the pipes are fitted in the right direction. ✓
 - Apply a light coat of PVC glue to the fitting and the pipe. ✓
 - Slightly twist and push parts into position. ✓
 - Remove all excess glue on the outside of the joint. (3)
- 9.5
- Soil water is effluent that contains human excreta. ✓ (2)
- Waste water is water that is discharged from a bath, shower, wash basin or sink. ✓
- 9.6
- 9.6.1 Invert level ✓ (1)
- 9.6.2 Unplasticised Polyvinyl Chloride ✓ (1)
- 9.6.3 Wash trough ✓ (1)
- 9.6.4 Waste pipe ✓ (1)

9.7 9.7.1  √√ (2)

9.7.2  √√ (2)

9.8 9.8.1 When water is discharged from fixture C the soil water will discharge into the discharge stack A. √ The vertical acceleration of the water in the discharge stack will cause a vacuum to form behind it √ sucking water from water traps in the same system. √ The vent stack B will allow air to enter the system √ to prevent the syphon action caused by the acceleration of water in the discharge stack. √ (5)

9.8.2 Soil pipes – 110 mm √
Waste-water discharge pipes – 50 mm √ (2)

9.9	WASTE FIXTURES	SOIL FIXTURES
	Sink √	Urinal √
	Bath √	

(3)

- 9.10
- Traps should be self-cleaning. √
 - The interior surface should be smooth with no sharp angles. √
 - The trap should function without any moving parts √
 - The material the trap is made of should not deteriorate as a result of the liquids flowing through it.
 - Traps should be watertight.
 - The seal should not be deeper than necessary to minimise resistance to the flow.
 - It must be designed in such a way that water flowing through the trap should not build up a momentum sufficient to unseal the trap.
 - The inlets and outlets should be connected easily to the fitting and outlet waste pipe.
- (3)

9.11	CISTERN	FLUSH VALVE
	<ul style="list-style-type: none"> • Parts are replaceable √ • Most parts are made of plastic √ • Strong flushing action • Can be installed close to the wall • Neat appearance • Can be manufactured in different colours if made from ceramics • Mechanism can be adjusted to save water • Easy to service • Low noise levels 	<ul style="list-style-type: none"> • Less pipework √ • Fewer components √ • Saves time as it is easy to install • Easy flushing mechanism • Look elegant • Saves water • Takes up little space • Can be flushed repeatedly as there is no cistern that needs to fill up

(4)

[40]

TOTAL SECTION C: 100

SECTION D: WOODWORKING

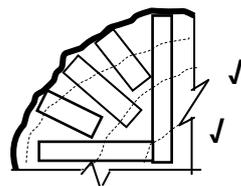
QUESTION 10: CASEMENTS, DOORS AND WALL PANELLING

- 10.1
- Seasoned timber will not react to moisture in the atmosphere. ✓
 - Seasoned timber is easier to work with.
 - Seasoned timber is lighter.
 - Seasoned timber will respond to finishing methods and glues.
 - Seasoned timber is resistant to attacks by insects and fungi.

ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER

(1)

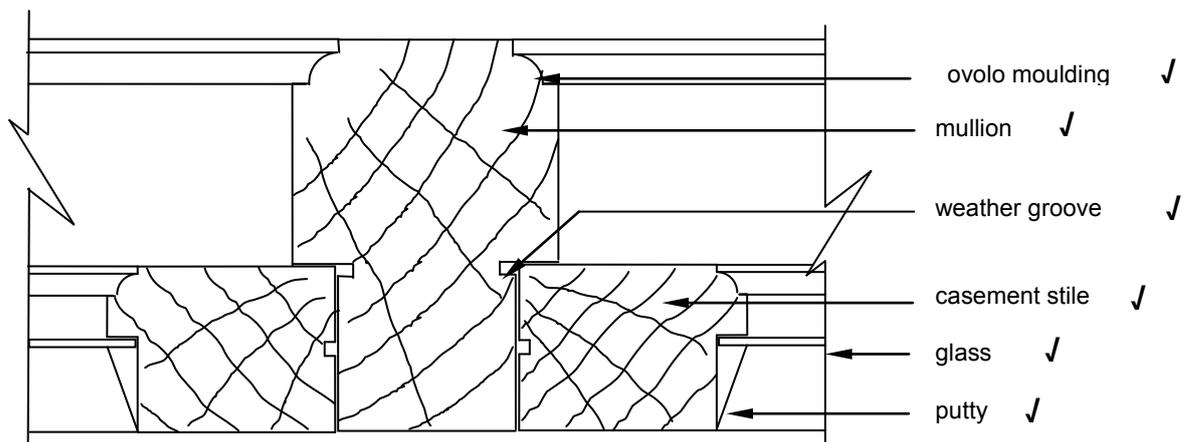
10.2



CONVERSION: QUARTER-SAWN METHOD

(2)

10.3



ANY OF THE ABOVE OR ANY OTHER ACCEPTABLE LABEL

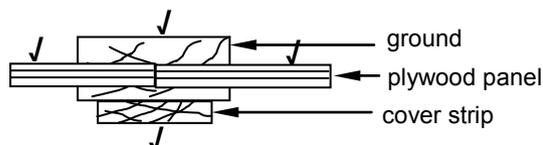
(6)

- 10.4
- Router ✓
 - Table saw
 - Spindle moulder

ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER

(1)

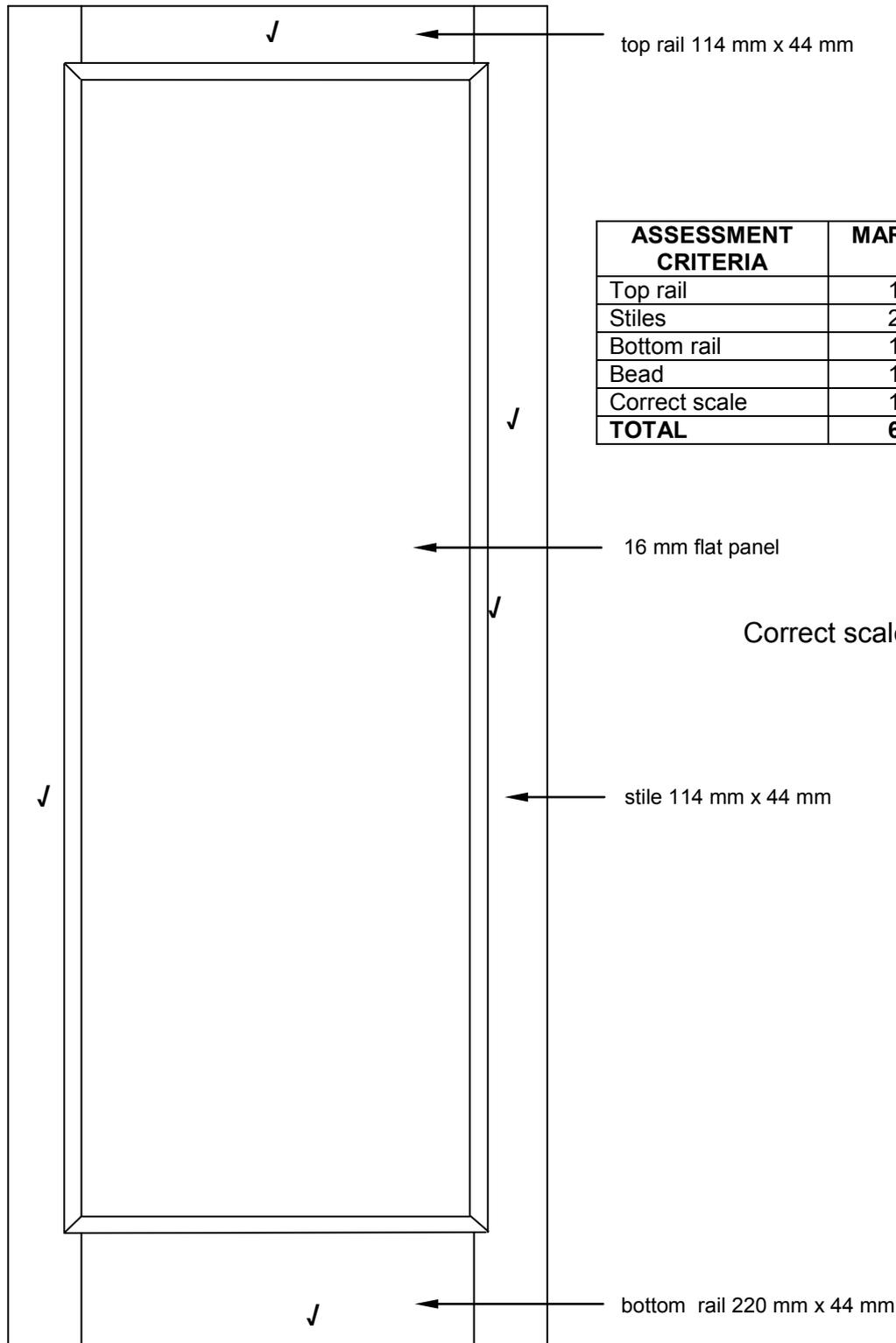
10.5



ASSESSMENT CRITERIA	MARKS	LM
Ground	1	
Panels	2	
Cover strip	1	
TOTAL	4	

(4)

10.6



ASSESSMENT CRITERIA	MARKS	LM
Top rail	1	
Stiles	2	
Bottom rail	1	
Bead	1	
Correct scale	1	
TOTAL	6	

Correct scale ✓

FRONT ELEVATION OF A ONE-PANEL DOOR

SCALE 1 : 10

NOT TO SCALE: USE A MASK TO MARK THIS QUESTION.

(6)

- 10.7
- Through mortice and tenon joint. ✓
 - Haunched mortice and tenon joint
 - Long and short shouldered mortice and tenon joint
 - Bare-faced mortice and tenon joint
- ANY ONE OF THE ABOVE** (1)

- 10.8
- Safety goggles ✓
 - Face shield
- ANY ONE OF THE ABOVE** (1)

- 10.9
- Width of panel = $813 \text{ mm} - (114 \text{ mm} + 114 \text{ mm}) + 24 \text{ mm} = 609 \text{ mm}$ (4)
- Length of panel = $2\ 032 \text{ mm} - (114 \text{ mm} + 220 \text{ mm}) + 24 \text{ mm} = 1\ 722 \text{ mm}$ (4)

OR

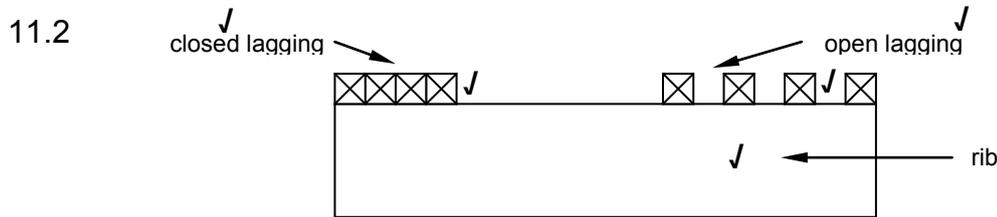
Width of panel = $813 \text{ mm} - (2/114 \text{ mm} + 2/12 \text{ mm}) = 609 \text{ mm}$

Length of panel = $2\ 032 \text{ mm} - (2/114 \text{ mm} + 2/12 \text{ mm}) = 1\ 722 \text{ mm}$

[30]

QUESTION 11: CENTERING, FORMWORK, SHORING

11.1 A centre is a temporary framework to support the voussoirs (bricks) of an arch while the arch is being built and is removed when the mortar joints have hardened. ✓ (1)



ASSESSMENT CRITERIA	MARKS	LEARNER'S MARK
Rib	1	
Closed lagging	1	
Open lagging	1	
Two labels	2	
TOTAL	5	

(5)

11.3

- Wear the appropriate safety apparel. ✓
- Concentrate at the point of operation.
- Do not let the cable come into contact with moving parts of the tool.
- Grip the tool with both hands.
- Maintain a sturdy stance.

ANY ONE OF THE ABOVE (1)

11.4 Band saw/Jig saw ✓ (1)

11.5 Formwork is a temporary support ✓ for concrete while it is being cast and is removed when the concrete has set or hardened. ✓
OR ANY OTHER ACCEPTABLE ANSWER (2)

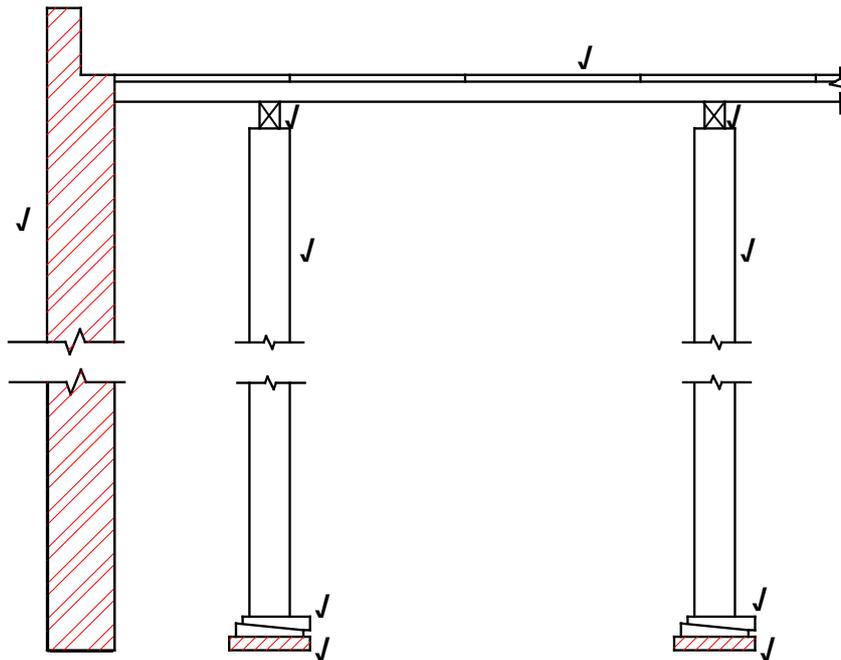
11.6

- Steel ✓
- Marine plywood
- Laminated board
- Block board timber

ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER (1)

11.7 It is desirable because it makes the striking of formwork easier. (1)

11.8



ASSESSMENT CRITERIA	MARKS	LEARNER'S MARK
Props	2	
Sole plate	2	
Wedges	2	
Bearers	1	
Joist	1	
Label: Props	1	
Label: Wedges	1	
TOTAL	10	

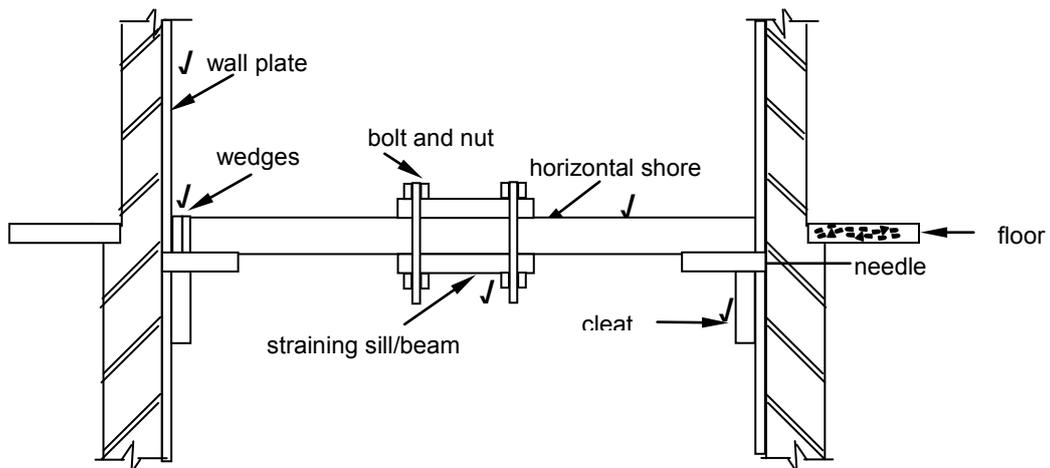
(10)

11.9

- Raking shores are installed when it is necessary to provide temporary lateral support to a building. ✓
- Raking shores are installed to support leaning or unstable walls and columns by transferring the weight to the raking strut/raker which then transfers the weight onto the sole piece embedded in the ground. ✓

(2)

11.10



ASSESSMENT CRITERIA	MARKS	LEARNER'S MARK
Wall plate	1	
Cleat	1	
Needle	1	
Horizontal shore	1	
Wedges	1	
Straining sill/beam	1	
TOTAL	6	

(6)
[30]

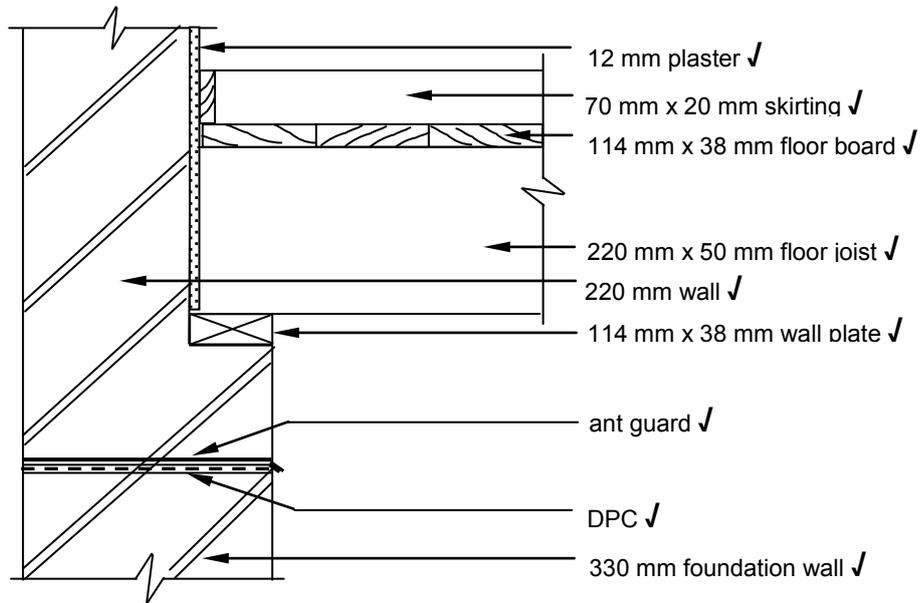
QUESTION 12: SUSPENDED FLOOR, CEILING, STAIRCASE, CUPBOARDS AND IRONMONGERY

- 12.1
- The timber will be protected against attacks by insects. ✓
 - The timber will last a long time.

ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER

(1)

12.2

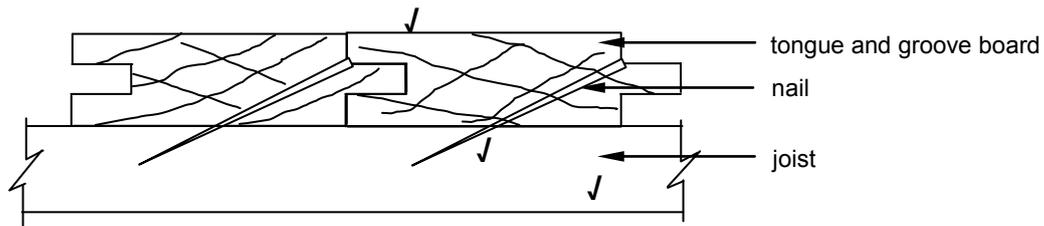


VERTICAL SECTION THROUGH A TIMBER SUSPENDED FLOOR ✓

ASSESSMENT CRITERIA	MARKS	LEARNER'S MARK
Foundation wall	1	
DPC	1	
Ant guard	1	
Wall plate	1	
Floor joist	1	
Floor boards	1	
Skirting	1	
External wall	1	
One label	1	
TOTAL	9	

(9)

12.3



ASSESSMENT CRITERIA	MARKS	LM
Tongue and groove board	1	
Secret nailing	1	
Joist	1	
TOTAL	3	

(3)

12.4

- Claw hammer ✓
- Cross-cut saw
- Level
- Square
- Builder's line
- Utility knife
- Measuring tape

ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER

(1)

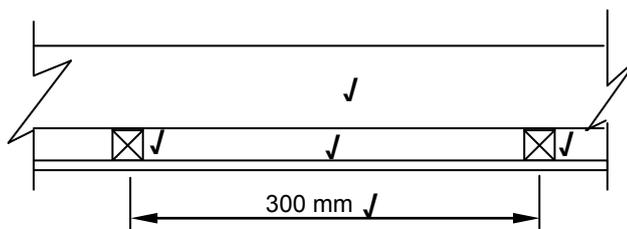
12.5

- Overall ✓
- Safety goggles
- Hard hat
- Safety gloves
- Safety shoes

ANY ONE OF THE ABOVE OR ANY OTHER ACCEPTABLE ANSWER

(1)

12.6



ASSESSMENT CRITERIA	MARKS	LM
Tie beam	1	
Branding	2	
Ceiling board	1	
Label: Brandering	1	
TOTAL	5	

(5)

12.7

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 cornice = $10 + 6 = 16 \text{ m}$ ✓

(3)

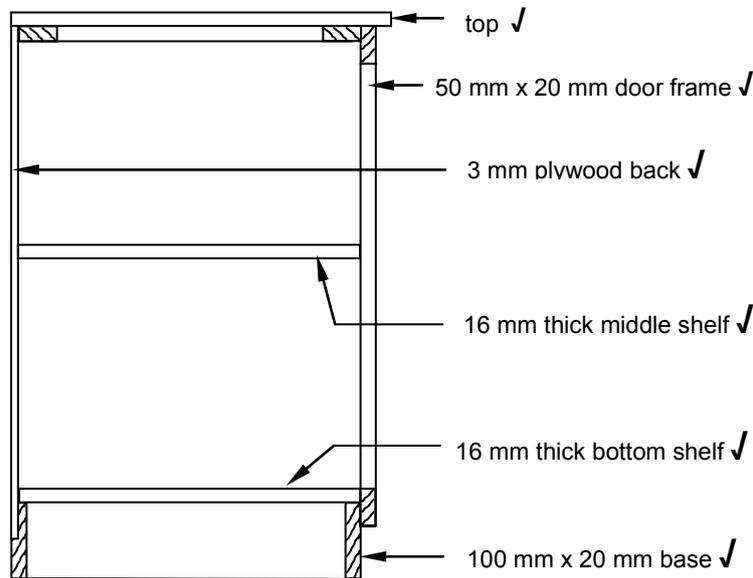
12.8

Rise is the vertical distance between two consecutive treads and a *riser* is a vertical board between two consecutive treads. ✓

(2)

- 12.9
- Outer string ✓
 - Inner string
- ANY ONE OF THE ABOVE** (1)

12.10 12.10.1



(6)

12.10.2 Hardboard (Masonite) ✓ (1)

- 12.10.3
- Melamine ✓
 - Solid timber
 - Supa wood (MDF)
 - Chip board
 - Laminated board
- (3)

- 12.11
- Piano hinge ✓
 - Butt hinge
 - Flush hinge
 - Tee hinge
- ANY ONE OF THE ABOVE** (1)

12.12 Handle ✓ (1)

12.13 12.13.1 Parliament hinge ✓ (1)

12.13.2 Barrel bolt ✓ (1)

[40]

TOTAL SECTION D: 100
GRAND TOTAL: 200