EC - LEARNER SUPPORT MATERIAL: CIVIL TECHNOLOGY WOODWORKING: GRADE 11

CONTENT TO BE COVERED:

TOPICS:

1. **JOINING (Generic) + (SPECIFIC)**

Identify and explain the use of:

- Bolts and nuts
- Rawl bolts
- Plastic plugs
- Rawl plugs

Methods of joining the following items:
Alternate methods of fixing window panes onto casement members and fixed frames.
Application, uses and drawings of the following woodworking joints (exploded and assembled views):
• Haunched mortise and tenon joint
• Twin mortice and tenon joint
• Double bare face tenon

2. **CASEMENT (Specific)**

Sketch of vertical section through the transom, bottom rail of fanlight and top rail of casement with glass and putty in position Identification of parts and the drawing of the external elevation of a double casement with fanlights and two horizontal glazing bars in the casement within a frame

3. **DOORS(Specific)**

External doors:
Application, drawing of front elevations, horizontal and vertical sections and constructional details of the following doors:

- Three panel door with raised and fielded panels with high lock rail
- Four panel door with low lock rail, raised panels and diminishing stile
- Framed ledge, brace batten doors with lock and bottom rails 22 mm thick

Application, drawing of front elevations, horizontal and vertical sections and constructional details of an entrance door with a shaped top rail and fixed sidelights within a frame.
Sketches showing differentiation between a door frame and jamb lining

4. **WALL PANELLING AND CUPBOARDS (Specific)**

a) Front elevation and vertical section showing methods of installing strip boards (tongue and groove boards) as wall panelling from floor to ceiling.
b) A horizontal section showing how the joint between two strip boards are joined.
c) A vertical section showing the rough grounds and the finish at the top of the panelling.

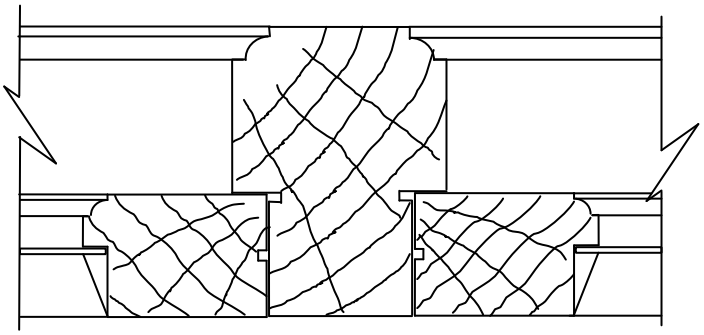
d) A vertical section showing the finish at the bottom of the panelling with a moulded skirting and quadrant.
e) Working drawings of a built-in and free-standing cupboard up to ceiling height to include:
    - Front view with doors
    - Front view without doors
    - Vertical cross-section showing drawer construction, hanging rail and shelves

EXAMPLE 1: QUSETION 1: CASEMENTS, DOORS AND WALL PANELLING

1.1 Give ONE reason why a carpenter should use seasoned timber to make a door. (1)

1.2 Draw one quarter of a log to show how quarter-sawn boards are obtained. (2)

1.3 The drawing **BELOW** shows the horizontal sectional view of a mullion with two adjacent casement stiles and glass in position. Label any **SIX** parts of the drawing. (6)



1.4 Name ONE machine that may be used to form rebates on frame members. (1)

1.5 Use drawing instruments and draw 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. (4)

1.6 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.

ASSESSMENT CRITERIA	**MARK**	**LM**
Top rail	1	
Stiles	2	
Bottom rail	1	
Correct scale	2	
TOTAL	**6**	

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)

1.7 Name ONE joint that may be used to join the stiles to the top rail of a door. (1)

1.8 Name the safety equipment you will use to protect your eyes when using an electric drill. (1)

1.9 Calculate the size of the plywood that will be required for the panel of the door in QUESTION 10.6 if the panel is set in a 12 mm groove of each member of the door.

Write down the following formula as a guide for your calculation:

Width of panel = _____ - (____ + _____) + ____ = _____

Length of panel = _____ - (____ + _____) + ____ = _____ (8)

[30]

ANSWER: EXAMPLE 1: QUSETION 1: CASEMENTS, DOORS AND WALL PANELLING

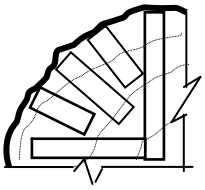
QUESTION 10: CASEMENTS, DOORS AND WALL PANELLING

1.1

- 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)

1.2

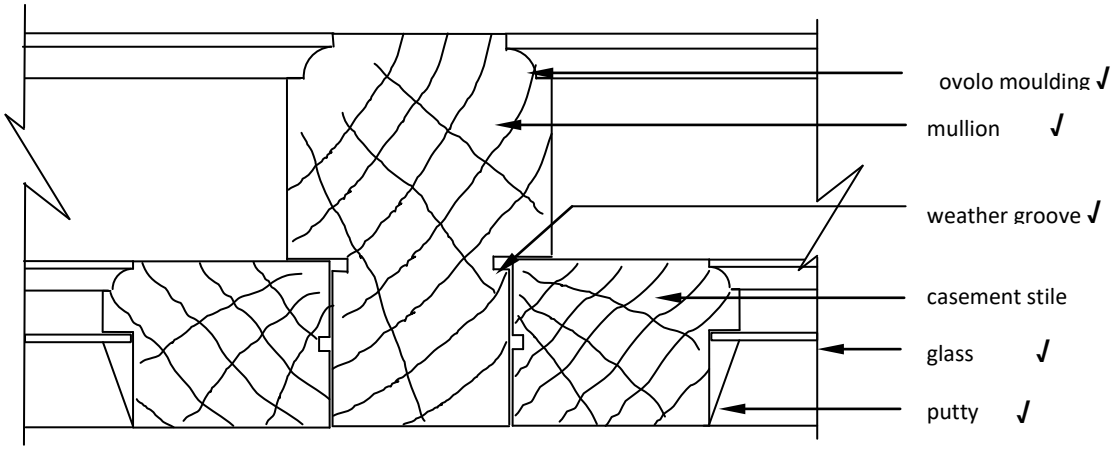


√

√

CONVERSION: QUARTER-SAWN METHOD (2)

1.3



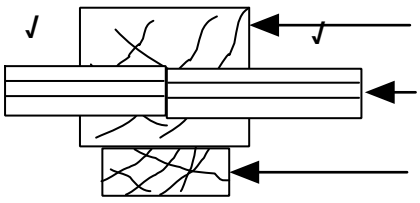
ANY OF THE ABOVE OR ANY OTHER ACCEPTABLE LABEL (6)

1.4

- Router √
- Table saw
- Spindle moulder

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

1.5



ground √

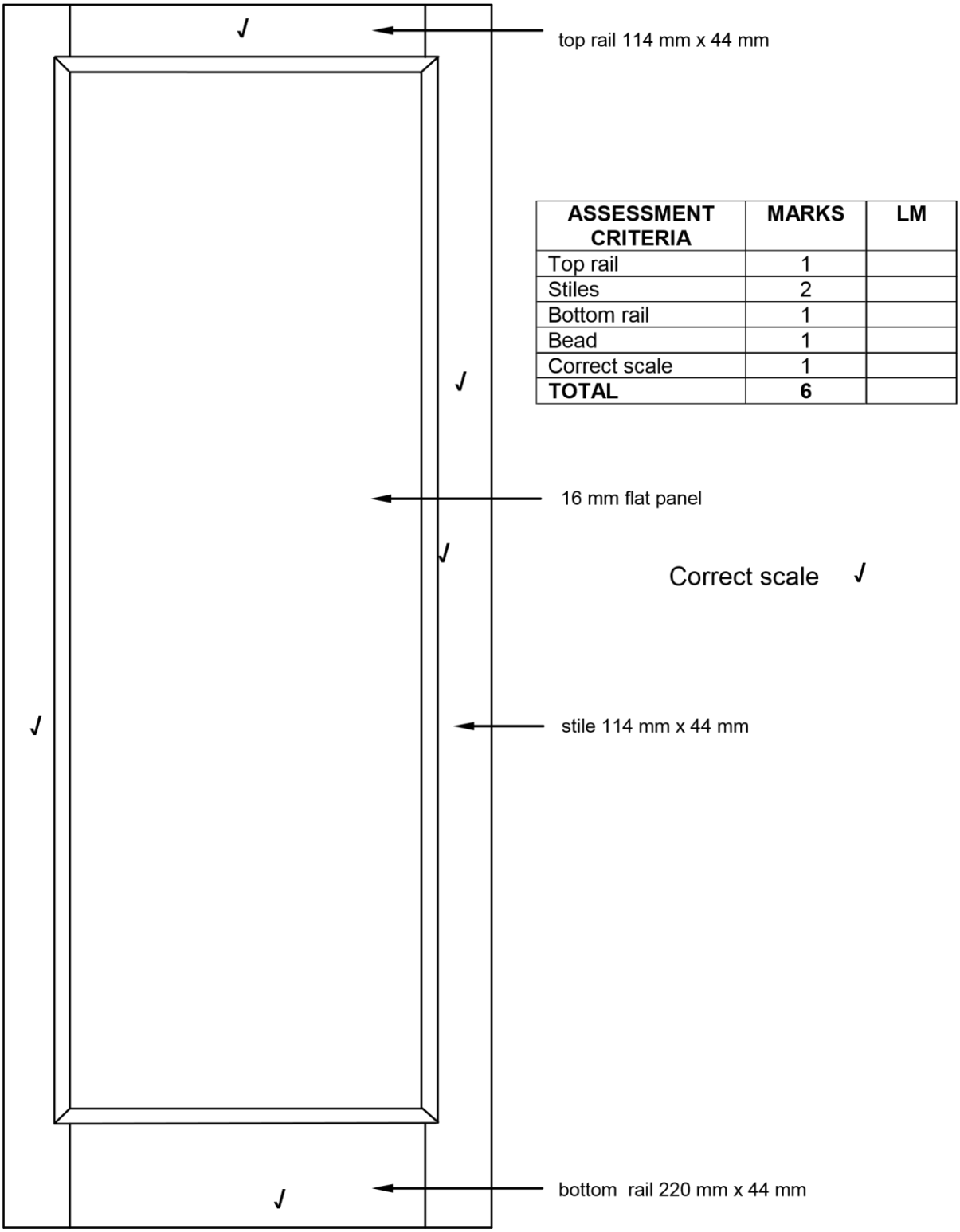
plywood panel √

cover strip √

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

(4)

1.6



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

FRONT ELEVATION OF A ONE-PANEL DOOR

SCALE 1: 10

NOT TO SCALE: USE A MASK TO MARK THIS QUESTION. (6)

1.7 • 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)

1.8 • Safety goggles √

• Face shield

ANY ONE OF THE ABOVE (1)

1.9 √ √ √ √

Width of panel = 813 mm - (114 mm + 114 mm) + 24 mm = 609 mm (4)

√ √ √ √

Length of panel = 2 032 mm - (114 mm + 220 mm) + 24 mm = 1 722 mm (4)

OR

√ √ √ √

Width of panel = 813 mm - (2/114 mm + (2/12 mm) = 609 mm

√ √ √ √

Length of panel = 2 032 mm - (2/114 mm + 2/12 mm) = 1 722 mm

[30]

EXAMPLE 2: QUESTION 2: JOINING, WINDOWS, DOORS AND WALL PANELLING (SPECIFIC)

2.1 What is the function of a fixing lug on a metal doorframe? (1)

2.2 Name THREE methods to fix a shelf to a wall. (3 x 1) (3)

2.3 Answer the following questions on the joint construction in **FIGURE 2.3.**

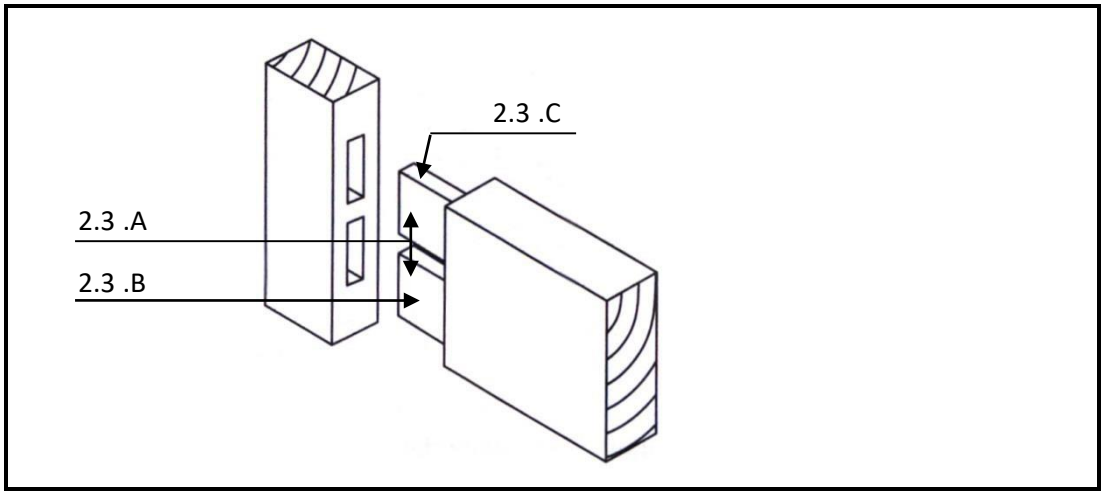


FIGURE 2.3

2.3.1 What is the name of the joint? (1)

2.3.2 In what type of construction will you use this joint? (1)

2.3.3 What part is **2.3.A?** (2)

2.3.4 What type of cheek is **2.3.B** and **2.3.C?** (2)

2.3.5 If hand tools are used to make this joint, what type of chisel will be used to chisel the hole? (1)

2.4 **FIGURE 2.4** on shows the incomplete horizontal view of a stile lipped and partially rebated into the mullion of a casement with glass.

Complete in good proportion the different parts of the stile of the adjacent left view:

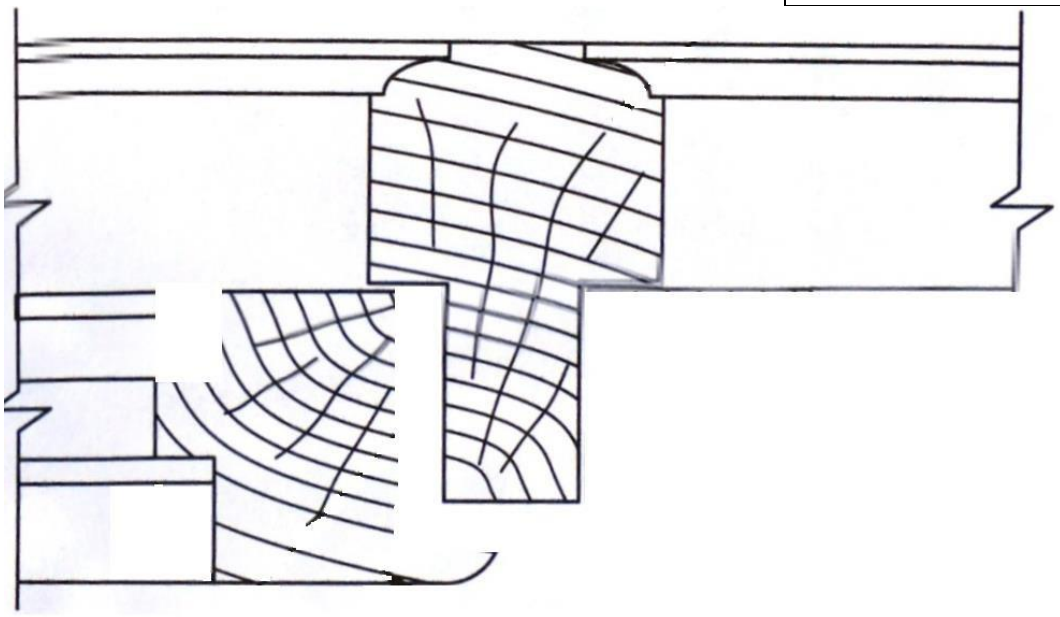
2.4.1 Ovolo moulding (2)

2.4.2 Putty for the glass (1)

2.4.3 Complete the lip of the stile (2)

2.4.4 Drip groove (2)

Ovolo mould	2	
Putty	1	
Edge of stile	2	
Drip groove	2	
TOTAL	**7**	



2.5 Motivate why a minimum space of 2 mm is allowed between the edge of the panel door and the edge of the groove. (2)

2.6 Make a neat drawing in good proportion of the back view of the framed, ledged and braced batten door. (6)

2.7 Name FOUR advantages of plywood for wall panelling. (4)
[30]

ANSWER: EXAMPLE 2: QUESTION 2: JOINING, WINDOWS, DOORS AND WALL PANELLING (SPECIFIC)

2.1 To be built into brickwork/Fix door frame to wall (1)

2.2

- Floating shelves
- Steel rail brackets
- Dowels
- Wall plug, supporting pins and screws (Any 3) (3)

2.3. 2.3.1 Double mortise and tenon joint (1)

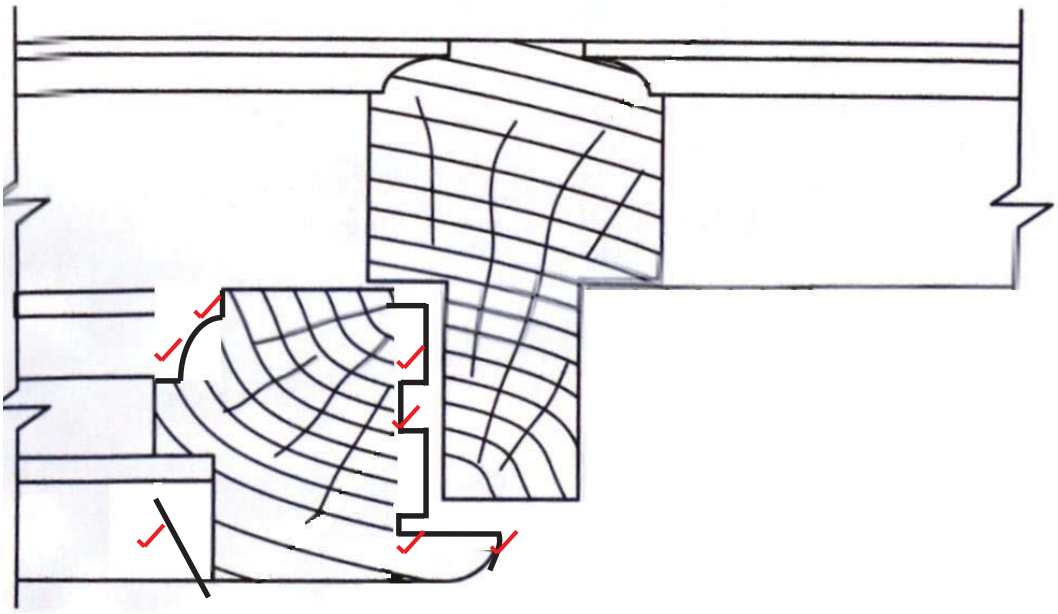
2.3.2 Doorframes (1)

2.3.3 Tenons (2)

2.3.4 2.3. B – Face cheek 2.3.C – Edge cheek (2)

2.3.5 Mortise chisel (1)

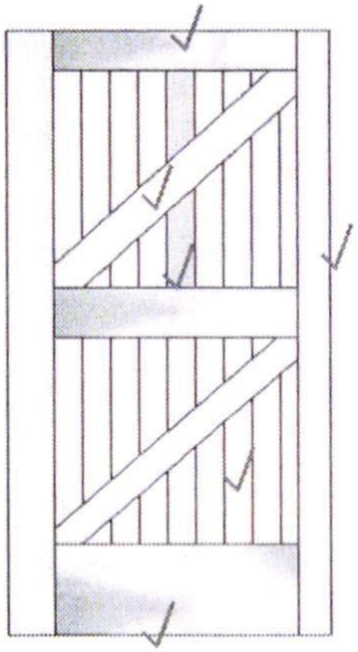
2.4 (7)



Ovolo mould	2	
Putty	1	
Lip of stilel	2	
Drip groove	2	
TOTAL	**7**	

2.5 For shrinkage and expansion (2)

2.6 Z-framed, ledged and braced batten door



(6)

2.7

- It gives a pleasing, decorative and durable appearance
- It conceals cracks in walls
- Panelling does not require the entire wall to be plastered
- Does not expand and shrink in the same way as solid timber
- Provides good insulation
- Requires no framework (4 x 1) (4)

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EXAMPLE 3: QUESTION 3: JOINING, WINDOWS, DOORS AND WALL PANELLING (SPECIFIC)

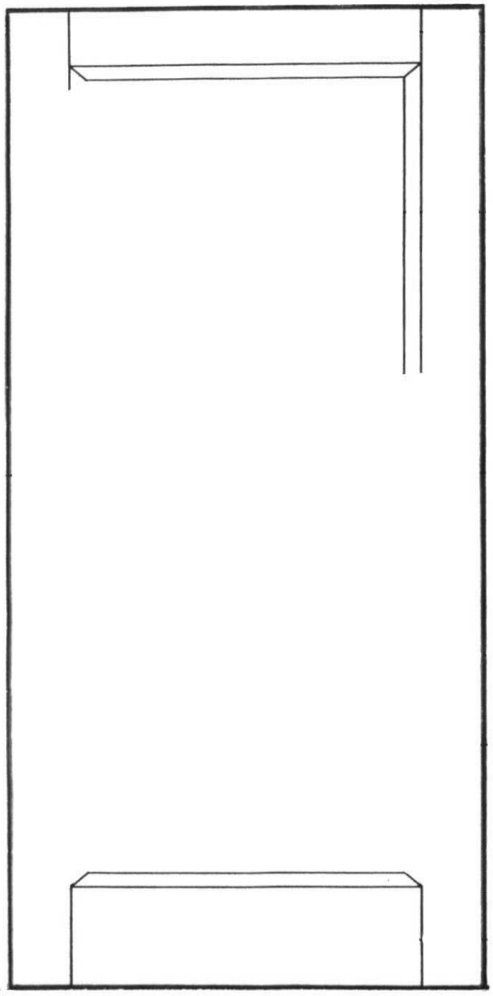
3.1 **FIGURE 3.1** shows the incomplete front view of a flat two-panel door with middle/lock rail.

3.1.1 Complete the drawing. (14)

3.1.2 Fill in the missing measurements. (3)

3.1.3 Identify at least THREE different parts of the door. (3)

3.1 Incomplete front elevation of a two-panel door with middle / lock rail. **(20)**



ASSESMENT CRITERIA	MARKS	CANDIDATE'S MARKS
Top rail	2	
Top flat panel	2	
Middle/Lock rail	3	
Quadrant/Quarter-round	2	
Bottom flat panel	2	
Bottom rail	1	
Measurements	3	
Scale	2	
Parts x 3	3	
TOTAL:	**20**	

3.2 Explain ONE use for each of the following:

3.2.1 Drip groove in a window (1)

3.2.2 Putty for the glass (1)

3.3 **FIGURE 3.3** below shows a sectional view of a tongue and groove wall panel from the floor to the ceiling, fastened to a 110 mm thick wall. Study the picture and answer the questions that follow.

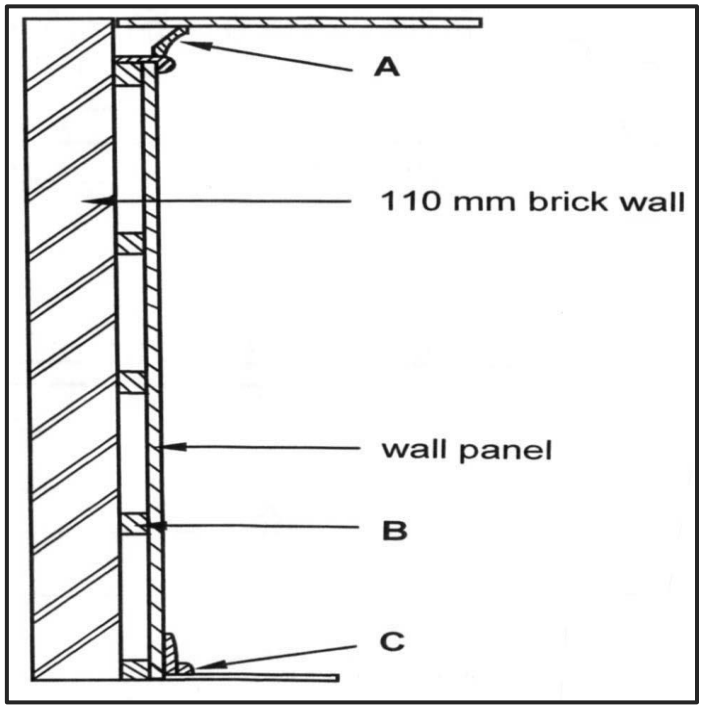


FIGURE 3.3

3.3.1 Identify the parts **A** to **C**. (3)

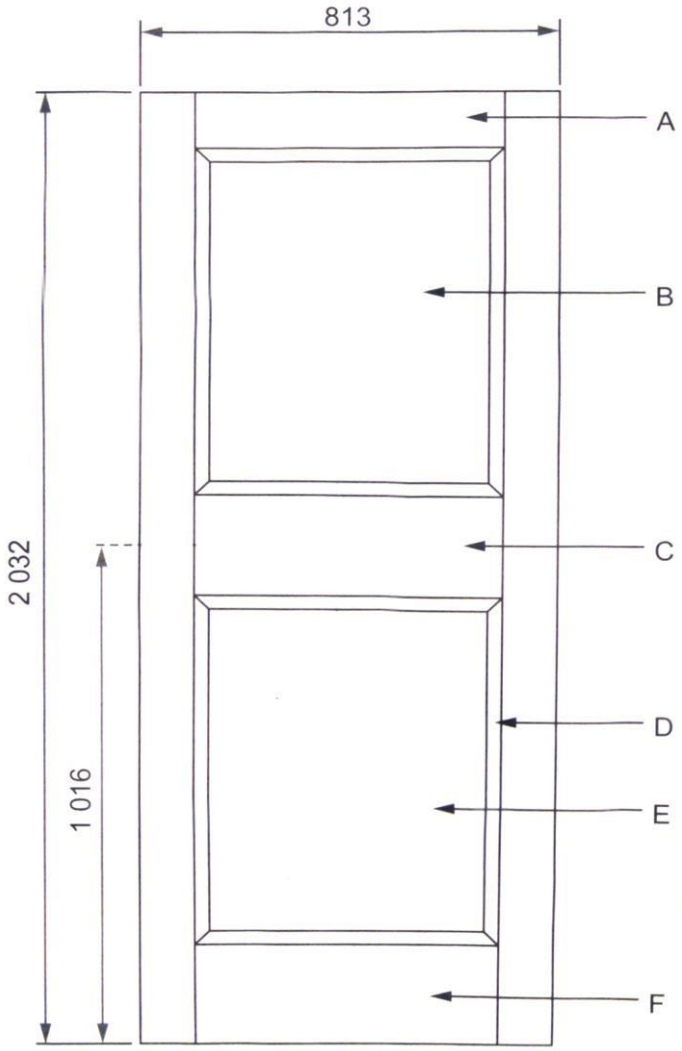
3.3.2 Give THREE reasons for panelling a wall. (3)

3.4 Recommend any TWO wooden board products that can be used as sides for formwork. (2)

[30]

ANSWER: EXAMPLE 3: QUESTION 3: JOINING, WINDOWS, DOORS AND WALL PANELLING (SPECIFIC)

3.1 Front elevation of a two-panel door with middle / lock rail.



NOT TO SCALE

ASSESMENT CRITERIA		MARKS	CANDIDATE'S MARKS
Top rail	(A)	2	
Top flat panel	(B)	2	
Middle/Lock rail	(C)	3	
Quadrant/Quarter-round	(D)	2	
Bottom flat panel	(E)	2	
Bottom rail	(F)	1	
Measurements		3	
Scale		2	
Parts x 3		3	
TOTAL:		**20**	

3.2 3.2.1 Prevents rainwater from being blown into the casement and penetrating the room. (1)

3.2.2 To hold or secure the glass / to prevent the glass from falling out of the frame. (1)

3.3 3.3.1 A – Cornice

B – Horizontal grounds
C – Quadrant mould (3)

3.3.2

- It gives a pleasing, decorative and durable appearance.
- It conceals cracks in the walls.
- Panelling does not require the entire wall to be plastered.
- It can be fixed directly to the walls.
- It provides insolation
- Keeps the room cool in the summer and warm in the winter.
- Expansion and shrinkage are minimal**.** **(Any THREE)** (3)

3.4 Shutter boards

- Plywood
- Blockboard **(Any TWO)** (2)

[**30]**