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SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

CIVIL TECHNOLOGY: WOODWORKING

MAY/JUNE 2024

MARKS: 200

TIME: 3 hours

This question paper consists of 14 pages and 8 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 the 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, 3.2, 3.3, 3.4, 5.5, 5.7, 6.6 and 6.7 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: OHS&A, MATERIALS, TOOLS, EQUIPMENT AND JOINING
(GENERIC)**

Start this question on a NEW page.

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.12) in the ANSWER BOOK, e.g. 1.1.13 D.

1.1.1 Water-based paint ...

- A can be applied to wet wood.
- B allows moisture to penetrate surfaces.
- C takes days to dry.
- D gives an elastic and flexible finish. (1)

1.1.2 Zinc can be applied to metals to

- A increase the thickness of the metal.
- B add strength to the original metal.
- C prevent rust.
- D All the above-mentioned (1)

1.1.3 ... improves the engineering and mechanical properties of metal.

- A Curing
- B Electroplating
- C Galvanising
- D Painting (1)

1.1.4 Toe boards are attached to a scaffold platform to ...

- A fix the scaffold platform to it.
- B stabilise the scaffold.
- C prevent tools from falling off.
- D prevent workers from falling off. (1)

1.1.5 The maximum height for a trestle scaffold:

- A 6 m
- B 3 m
- C 8 m
- D 10 m (1)

1.1.6 Suspended scaffolds can be made of ...

- A fibreglass.
- B steel.
- C graphite.
- D fibre cement. (1)

- 1.1.7 A ... can be used to dispose of waste material.
- A conveyer belt and chute
 - B ladder
 - C scaffold
 - D None of the above-mentioned (1)
- 1.1.8 Properties that define a builder's hoist:
- A It is a lifting device
 - B The type of power
 - C The size of the cables
 - D Only A and B (1)
- 1.1.9 Workers must not use ... stairways that will be a temporary part of the structure when carrying materials.
- A straight
 - B timber
 - C spiral
 - D half landing (1)
- 1.1.10 Stairways must not be installed more than ... degrees from the horizontal.
- A 50
 - B 30
 - C 40
 - D 75 (1)
- 1.1.11 When a ladder is placed against a wall, the angle must be at a ratio of ...
- A 1 : 3
 - B 1 : 4
 - C 1 : 5
 - D 1 : 6 (1)
- 1.1.12 A/An ... ladder must never be used near electrical cables.
- A aluminium
 - B timber
 - C synthetic
 - D fibreglass (1)

- 1.2 You have been tasked to install a bathroom cabinet against a wall.
- 1.2.1 Name the joining fixture you will use to secure the cabinet. (1)
- 1.2.2 Motivate why you will use this joining fixture. (2)
- 1.2.3 Explain how you will install the cabinet with pre-drilled holes by using the joining fixture in QUESTION 1.2.1. The positions of the holes have been marked on the wall. (3)
- 1.3 You have been asked by a contractor to install a shower in a bathroom.
- 1.3.1 Name the tool to detect existing water pipes in the wall. (1)
- 1.3.2 Name the tool to ensure that the top of the cubicle is level. (1)
- [20]**

QUESTION 2: GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)

Start this question on a NEW page.

FIGURE A and FIGURE B on the next page show drawings that appear on a building plan. Analyse the drawings and complete the table on ANSWER SHEET 2.

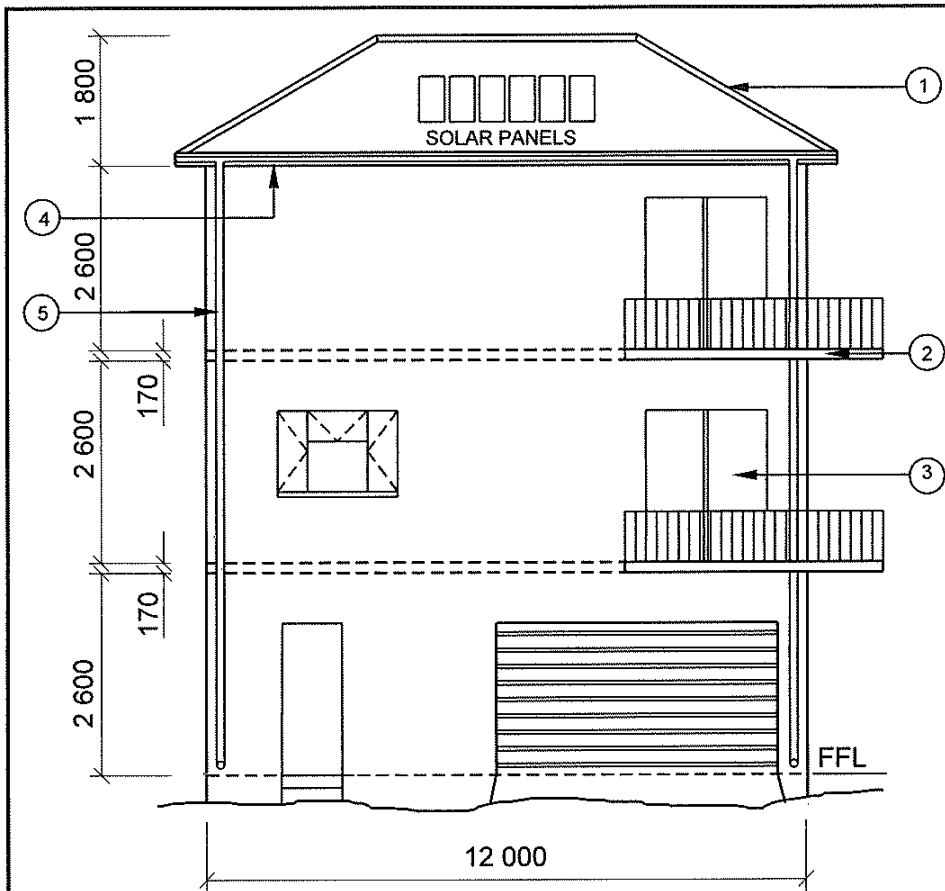


FIGURE A

NOTES:
Contractors must verify all dimensions and levels on site before commencing work.

Architects to be notified of any discrepancies immediately.

Finishing of walls: Stone cladding

Sliding doors are installed with laminated safety glass

Dimensions of sliding doors: 2 100 mm x 1 800 mm

Concrete stairs according to engineer's specifications

Balusters: To be made of 40 mm x 40 mm steel tubing and a height of 1 200 mm

Architect's signature

Client's signature

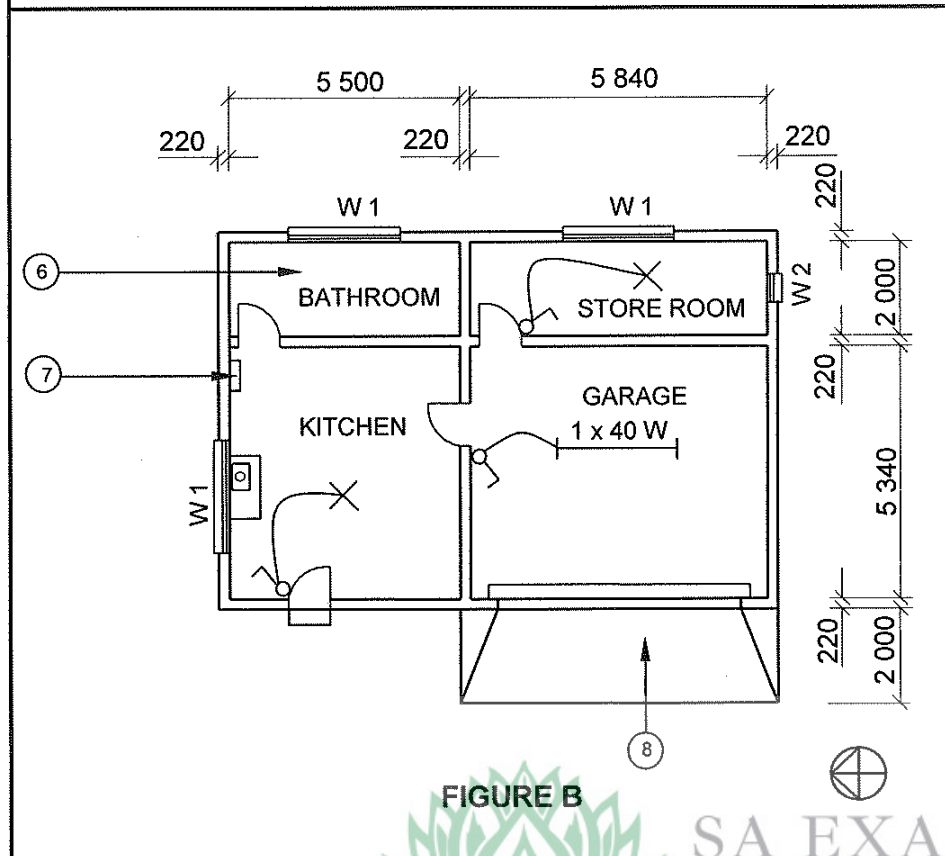


FIGURE B

REVISION 1	DATE: 20/02/2024	DRAWING OF BALUSTRADES
PRINTED BY: FOX PRINTERS		DATE OF PRINT: 22/04/2024
DRAWING TITLE: GROUND FLOOR AND WEST ELEVATION		
PROJECT: PROPOSED DWELLING OF MR P XHOSA PLOT 46, PROTEA STREET, PHOENIX		
PROJECT NO.: GR 320-224	DRAWING NO.: 446P5	
DATE: 16/04/2024	DRAWN: JN KRIEL	CHECKED: E BUYS
ELEVATION AND FLOOR PLAN		SCALE 1 : 100
REFERENCE CODE QP 6 - 2024		
WINDOW SCHEDULE		

[40]

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

Start this question on a NEW page.

- 3.1 FIGURE 3.1 below shows a vertical section through a double casement where the rails are lipped and rebated into the frame window with a fanlight. C is part of the casement.

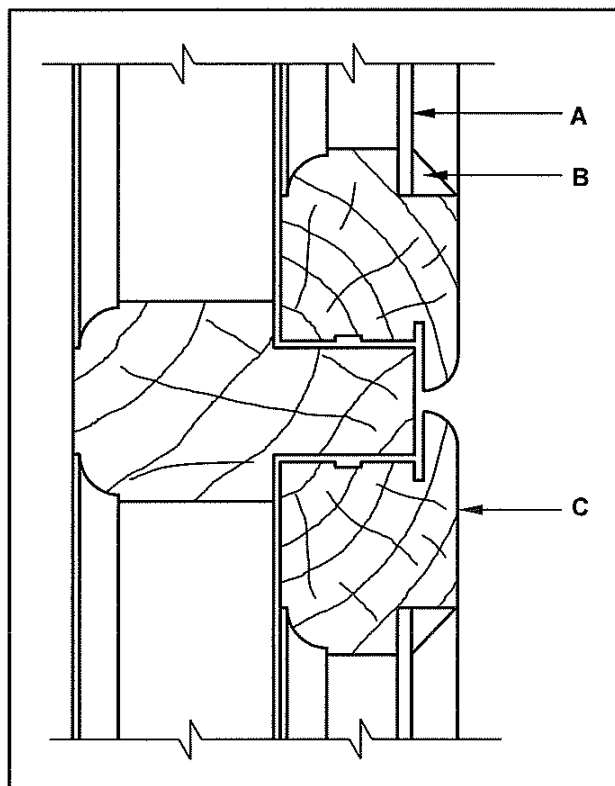


FIGURE 3.1

- 3.1.1 Identify part A and C. (2)
- 3.1.2 Describe the function of B. (1)

3.2 FIGURE 3.2 below shows a line diagram of a South African (Howe) roof truss.

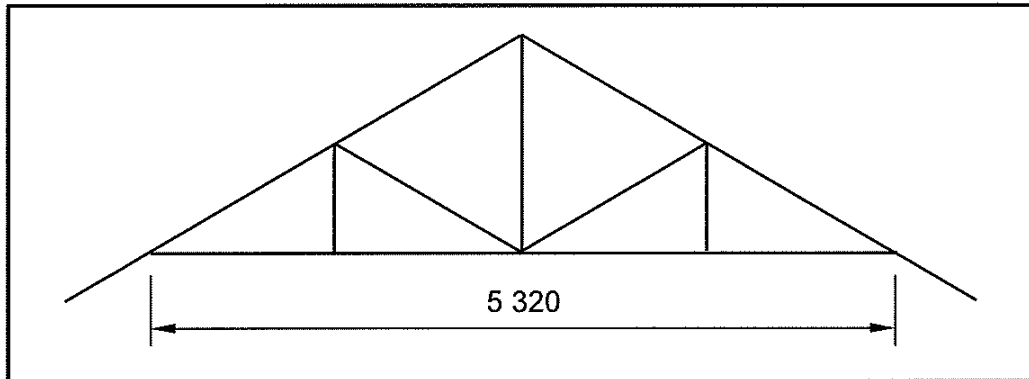


FIGURE 3.2

Use the following specification:

- The roof has SEVEN South African (Howe) roof trusses.

Use ANSWER SHEET 3.2 and calculate the following:

- 3.2.1 The total number of queen posts (3)
- 3.2.2 The total number of tie beams (2)
- 3.2.3 The total length of timber required for the tie beams (3)

NOTE: A mark will be awarded for the correct use of the dimension paper. (1)

3.3 Use ANSWER SHEET 3.3 and draw the front view of the middle section of the wall panelling indicating TWO tongue and groove boards that are partly removed to reveal TWO horizontal rough grounds. (4)

3.4 ANSWER SHEET 3.4 shows the front view of the framework of a freestanding cupboard without the doors. Project the detail of the freestanding cupboard and draw a sectional left view on cutting plane A-A.

Use the following specifications:

- The cupboard is made of 16 mm melamine boards.
- The drawer bottom is made of 3 mm hardboard.
- The back is made of 3 mm hardboard.

DO NOT show any hidden detail on the drawing.

(14)
[30]

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

Start this question on a NEW page.

- 4.1 Choose a description from COLUMN B that matches the item in COLUMN A. Write only the letter (A–H) next to the question numbers (4.1.1 to 4.1.5) in the ANSWER BOOK, e.g. 4.1.6 J.

COLUMN A		COLUMN B	
4.1.1	Table saw	A	a V-block must be used to drill holes into cylindrical parts
4.1.2	Band saw	B	grip the handle with your right hand to pull the rotating blade towards you
4.1.3	Combination belt and disc sander	C	ensure that the blade guides and blade supports are in the right position
4.1.4	Spindle moulder	D	when drum sanding is done, feed the work with the direction of the rotating bit
4.1.5	Drill press	E	only use half of the capacity of the machine when cutting thin wood
		F	the stock should be fed slowly into the cutters
		G	ensure that the splitter is in position when doing rip cutting
		H	always move the work slowly across the table and against the abrasive material

(5 x 1)

(5)

- 4.2 Change the underlined word(s) in the following to make the statements correct. Write the appropriate word(s) next to the question numbers (4.2.1 to 4.2.5) in the ANSWER BOOK.

4.2.1 The letter next to the SABS symbol indicates the grading method and the colour indicates the strength. (1)

4.2.2 Traditional wax, made by adding thinners to beeswax, has been replaced by ready-made polishes. (1)



- 4.2.3 Lacquer penetrates and feeds the wood. (1)
- 4.2.4 Timber is preserved to protect it from being infested by rodents. (1)
- 4.2.5 When selecting timber for skirting, you must consider whether it should have a strip at the back. (1)
- 4.3 Explain how you would construct the frame of a trap door, finished off with timber cover strips. (5)
- 4.4 State TWO advantages and TWO disadvantages of a thatched roof. Tabulate your answer. (4)
- 4.5 Explain how you will install a thatched roof. (4)
- 4.6 FIGURE 4.6 below shows two different fixtures used in roofing. (4)

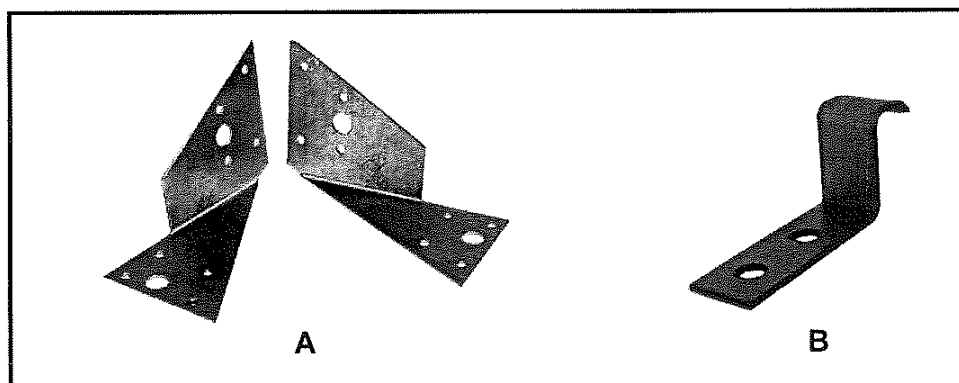


FIGURE 4.6

- 4.6.1 Identify A and B. (2)
- 4.6.2 State TWO uses of A and B respectively. (4)
- 4.7 Name ONE essential part that must be used with roofing fasteners to prevent leakage at the screw or nail. (1)
- 4.8 Truss hangers are used to join members of a roof together. Name the angles that truss hangers are manufactured in. (2)
- 4.9 Due to birds nesting under the open eave of your roof, you want to change the open eave of the roof to a closed eave. List FOUR members that you need to add to the construction in order to make it a closed eave. (4)

- 4.10 Safe handling and care is of utmost importance when using the jigsaw illustrated in FIGURE 4.10 below.

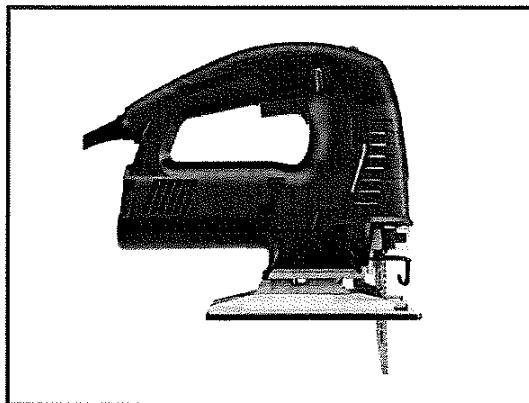


FIGURE 4.10

- 4.10.1 What determines the cutting speed of the machine? (1)
- 4.10.2 Explain why it is important to perform precuts when using the jigsaw. (1)
- 4.10.3 Explain, in TWO steps, the procedure to cut out a circle in a piece of wood after the circle has been marked out. (2)
- [40]

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

Start this question on a NEW page.

- 5.1 Name the material that can be used for soleplates for dead shores. (1)
- 5.2 The soleplates spread the transferred load over a wider area. Name the part that transfers the load onto the soleplates. (1)
- 5.3 Differentiate between *dead shores* and *double flying shores* regarding the use of steel dogs. (2)
- 5.4 Which member will be used to enable height adjustments when working with shores? (1)
- 5.5 ANSWER SHEET 5.5 shows an incomplete horizontal sectional view of formwork for a round column. Draw ONE half of the formwork for the round column where horizontal clamps are used to tighten the yokes/collars. Print the label of the yoke/collar. (8)
- 5.6 FIGURE 5.6 below shows part of a rib when working with centering. (1)

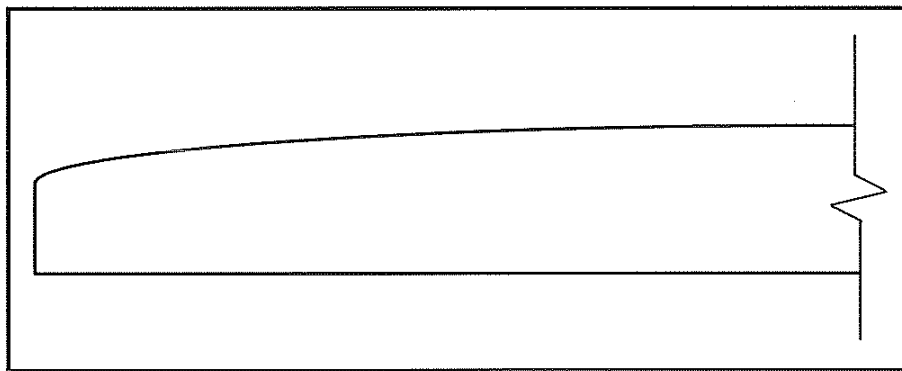


FIGURE 5.6

- Use your ANSWER BOOK and re-draw TWO ribs to differentiate between *open* and *closed laggings* to support a segmental arch. Print the title under each drawing. Show at least THREE laggings in each drawing. (6)
- 5.7 ANSWER SHEET 5.7 shows a drawing of an exploded isometric view of a long and short shoulder mortise and tenon joint. The rail is completed with hidden detail and the stile is incomplete. (11)
- Project the measurements from the given detail on the rail and complete ALL hidden detail of the mortise (hole) and the stile. [30]

QUESTION 6: SUSPENDED FLOORS, STAIRCASES, IRONMONGERY, DOORS AND JOINING (SPECIFIC)

Start this question on a NEW page.

- 6.1 Name TWO types of doors that can be locked with cut cupboard locks. (2)
- 6.2 What is important to mention when buying a cut cupboard lock or a straight cupboard lock? (1)
- 6.3 FIGURE 6.3 shows the steps of marking out of the mortises of a double stub mortise and tenon joint for the lock rail of a three-panel door. (1)

NOTE: The short dash lines indicate the width of the lock rail.

Explain what is done in the steps shown in A–D below.

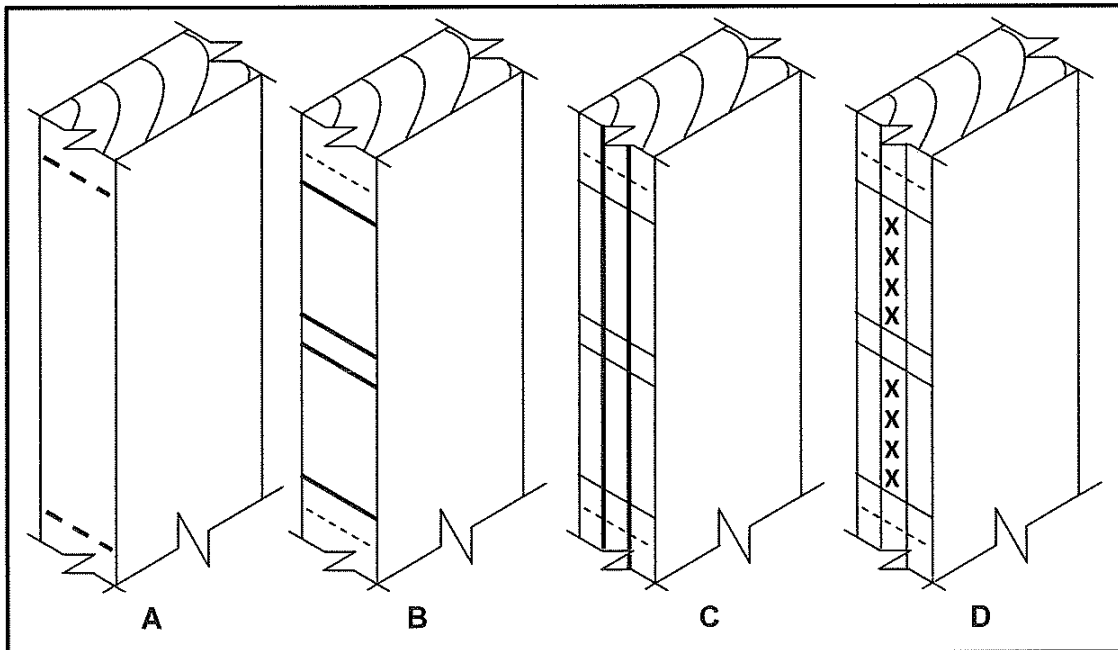


FIGURE 6.3

- (4)
- 6.4 In the ANSWER BOOK, differentiate by means of drawings between the horizontal sectional views of a door frame and a jamb (vertical lining). (6)
- 6.5 In the ANSWER BOOK, differentiate by means of two-dimensional drawings between the front views of a raised panel and a raised and fielded panel. (4)
- 6.6 ANSWER SHEET 6.6 shows the top view of a stairwell at a school where a staircase between two floors needs to be installed. Draw the layout of the stairs with a half-landing and an open well between the two flights of stairs. Indicate the rise of the stairs and the newel posts on the drawing. A indicates the lower floor level. (9)



6.7 ANSWER SHEET 6.7 shows the floor plan of a storeroom with a very high ceiling. You have to install a suspended timber floor to make use of the available space. Use ANSWER SHEET 6.7 to design and draw a two-dimensional drawing of the top view of the suspended timber floor.

Use the following specifications:

- The size of the material used for the floor joists is 114 mm x 38 mm.
- The floor joists must be built into the walls.
- Eight floor joists, equally spaced, are used for the floor.
- Staggered struts should be used as support.
- Folding wedges need to be installed on both sides in order to tighten the struts.
- There must be a clearance between the wall and the floorboards.
- Draw **ONLY TWO** floorboards in the bottom right corner to show the effect of the floorboards installed.

(14)

[40]

TOTAL: 200

