

23.0 BUILDING CONSTRUCTION (446)



23.1 Building Construction Paper 1 (446/1)

SECTION A

1 (a) Tools/equipment for setting out corners:

- (i) site square
- (ii) builders square
- (iii) dumpy level
- (iv) theodolite

(Any 2 x 1/2 = 1 mark)

(b) Types of foundations:

Name of foundation	Type of soil
Natural	Rock
Strip	Hard/firm soil
Pad	Hard/firm soil
Pile	Weak soil
Raft	Peat, wet clay soil

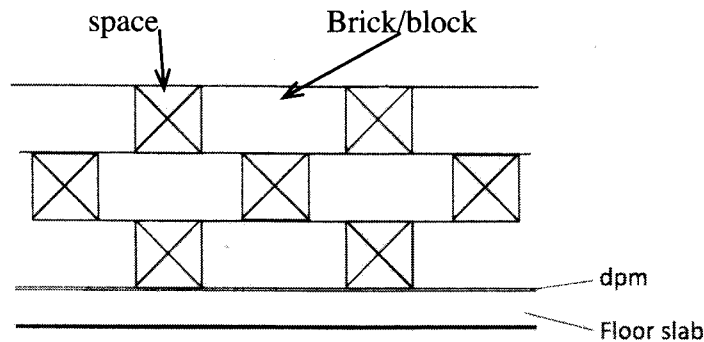
(Any 2 x 1/2 = 1 mark)

2 (a) Reasons for discouraging the use of fine aggregates:

- (i) to reduce drying shrinkage
- (ii) to check against reduced strength
- (iii) to reduce the amount of cement used

(Any 2 x 1/2 = 1 mark)

(b) Honey comb wall:



Spaces - 1/2 mark  
 Correct bonding - 1/2 mark  
 Labels Any 4 x 1/2 = 2 marks  
Total = 3 marks

3 (a) Functions of over site concrete:

- (i) provide a firm base on which to lay floor finishes
- (ii) provide a level surface
- (ii) prevent growth of vegetation
- (iv) prevent ingress of moisture from soils below
- (v) thermal insulation
- (vi) sound proofing

(Any 4 x 1/2 = 2 marks)

- (b) **Damp Proof Course (DPC)** is used in a building to provide a barrier to the passage of moisture from an external source into the fabric of a building vertically/through the wall.

**Damp Proof Membrane (DPM)** is used to prevent the passage of moisture from the lower part of ground to the upper surface of the floor. (2 x 1 = 2 marks)

4. (a) **Scaffolds**

- (i) A scaffold is a temporary structure which is erected to provide access/enable the workers, materials and equipment get to heights which cannot be reached from the ground. (1 x 1 = 1 mark)
- (ii) Independent e.g. tower, trestle (types 2 x 1/2 = 1 mark)  
Dependent e.g. putlog, cantilever (example 2 x 1/2 = 1 mark)  
(Total = 3 marks)

(b) **Four factors that will influence the positioning of a pit latrine on a site**

- (i) wind direction  
(ii) slope of land  
(iii) distance to wells  
(iv) Security to the users

(4 x 1/2 = 2 marks)

5. (a) **Two tools used for landscaping**

- (i) jembe  
(ii) panga  
(iii) rake  
(iv) fork  
(v) Mattock

(Any 2 x 1/2 = 1 mark)

(b) **Function of parts of a window sill**

- A - Joggel - for mixing window frames and water seals  
B - Slope - for shedding off water  
C - Throat - for dripping off water

(Naming 3 x 1/2 = 1 1/2 marks)  
(Functions 3 x 1/2 = 1 1/2 marks)

6. (a) (i) **Items of safety wear worn on site:**

- (i) helmet  
(ii) overall  
(iii) overcoat/apron  
(iv) boots  
(v) muffs  
(vi) goggles

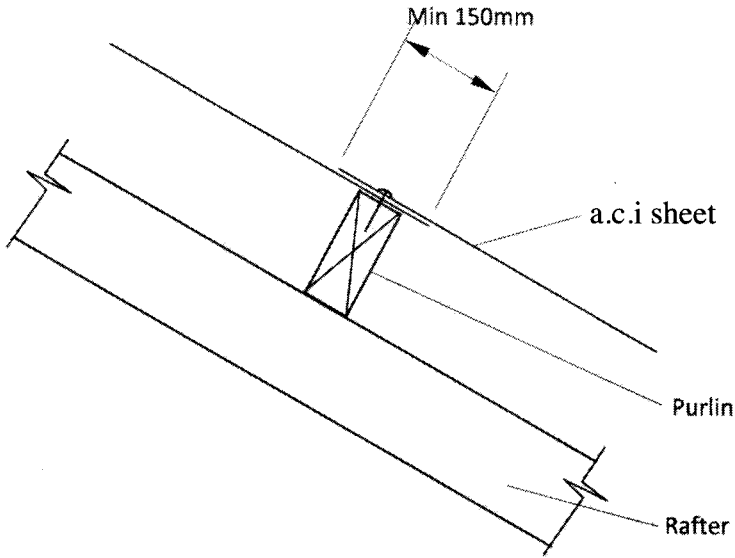
(Any 2 x 1/2 = 1 marks)

(ii) **Types of inspection before work commences in a deep trench:**

- (i) collapse of the trench sides  
(ii) cracks on the trench sides  
(iii) timber supports to the trench sides  
(iv) water in the trench bottom  
(v) levelling

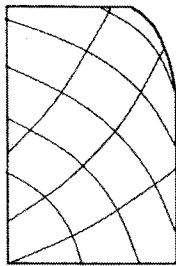
(Any 2 x 1 = 2 marks)

(b)

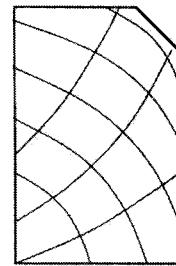


Sketch = 1 mark  
Lap 150 min =  $\frac{1}{2}$   
Nail Position =  $\frac{1}{2}$   
(Total = 2 marks)

7. (a) **SKIRTINGS - treatment to edges**



Rounded



Chamfered

Sketching = 1 mark  
Naming = 1 mark  
(2 marks)

(b) **Reasons for determining rating of bulbs:**

- (i) function of the room
- (ii) decoration of the room
- (iii) size of the room
- (iv) size of openings in the room.

(Any 2 x 1 = 2 marks)

8. **Procedure of laying terrazzo:**

- (i) prepare the background
- (ii) lay the cement-sand screed
- (iii) lay the dividing strips
- (iv) mix, place and compact the terrazzo
- (v) grind and clean the floor finish

(3 marks)

9. **Functions of roof truss members:**

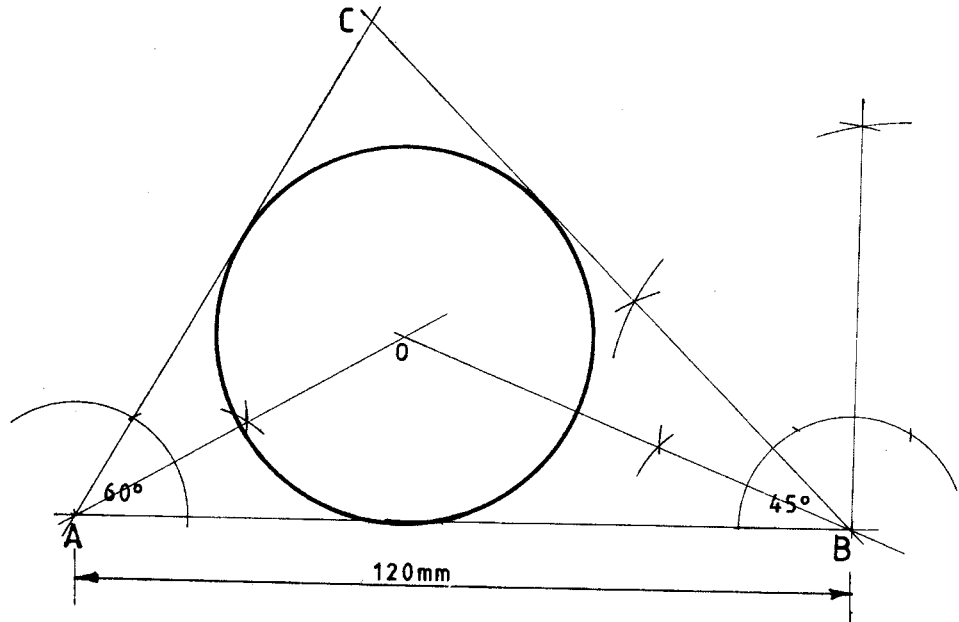
- (a) Rafters
  - (i) distribute loads from roof to load bearing walls
  - (ii) provides the pitch for the roof
  - (iii) holds other members together

(Any 2 x 1 = 2 marks)

- (b) Tie beam
- (i) tying the truss
  - (ii) fixing of branding and ceiling
  - (iii) supporting the water cistern
  - (iv) supporting service pipes for water and electricity

for (Any 2 x 1 = 2 marks)

10.



Construction

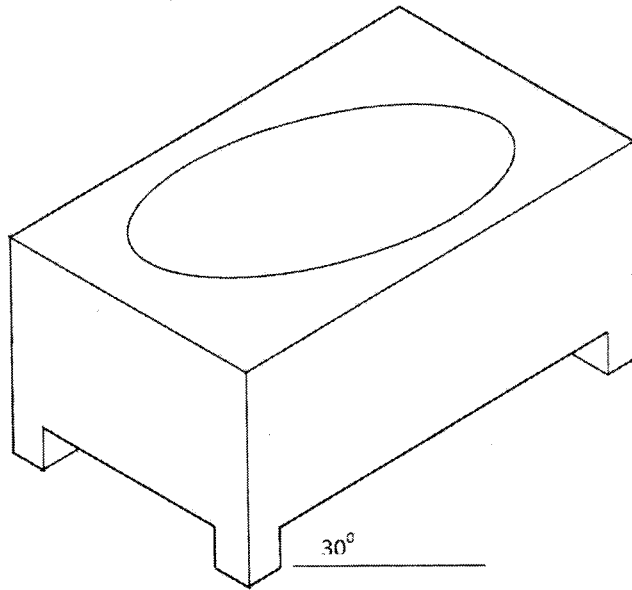
Line AB = 120 mm	= 1/2 mk
$\hat{C}AB = 60^\circ$	= 1/2 mk
$\hat{C}BA = 45^\circ$	= 1/2 mk
Point C	= 1/2 mk
Bisectors at A & B	= 1 mk
Inscribed circle	= 1 mk
	4 mks

11.

- 6 surfaces		Any 6 x 1/2 =	3 marks
- Construction details			2 marks
- Isometric			1 mark
- Ellipse	- major axis	2 offsets (2 x 1/2) =	1 mark
	- minor axis	2 offsets (2 x 1/2) =	1 mark
	- smooth curve of ellipses		2 marks
- Taper on 4 edges		4 x 1/2 =	2 marks
- Correct scale	(1:1)		1 mark
- Outlines (bold)			1 mark
- Lowest point 'X'			1 mark
			15 marks

TOTAL

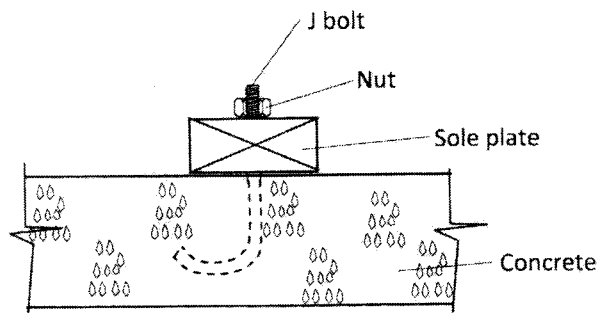
15 marks



**SECTION B**

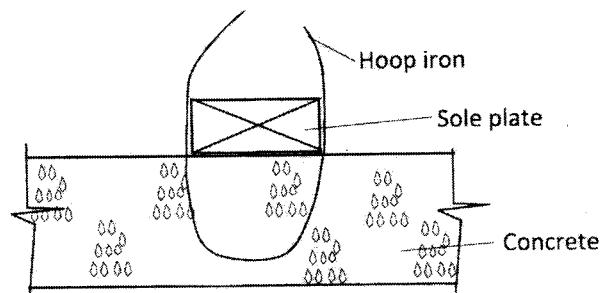
**12. (a) Methods of anchoring the sole plate of a timber wall frame:**

(i) using J-bolt



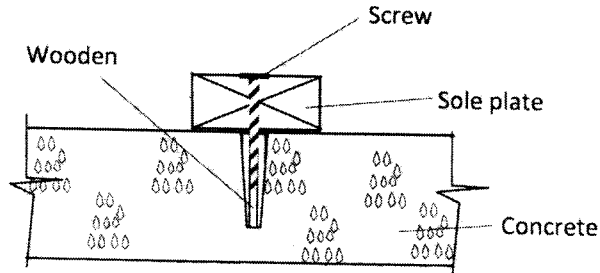
- mark the position of the sole plate
- cap the J-bolt in position during concreting
- mark the position of bolt on the sole plate and drill
- plug and fix sole plate with nuts

(ii) using strap/hoop irons:



- hoop irons are cast in site during the concreting stage
- sole plate is positioned
- hoop irons are stretched and nailed onto the sole plate

(iii) using wooden plug:



- drill holes on the concrete bed to accommodate the wooden plugs
- drive wooden plugs into the holes
- position the sole plate and secure onto wooden plugs with nails or screws

Name =  $\frac{1}{2}$

Sketch =  $2\frac{1}{2}$

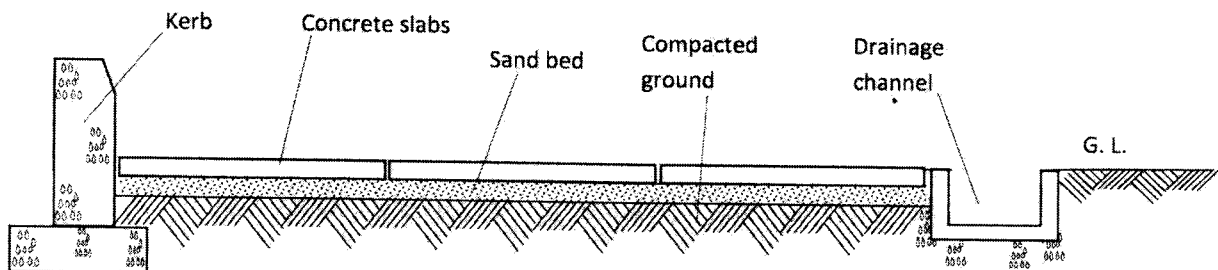
Labels =  $2 \times \frac{1}{2} = 1$

Explanation =  $3 \times \frac{1}{2} = 1\frac{1}{2}$

5 $\frac{1}{2}$

Any 2 x 5 $\frac{1}{2}$  = (11 marks)

(b) **Public Footpath**



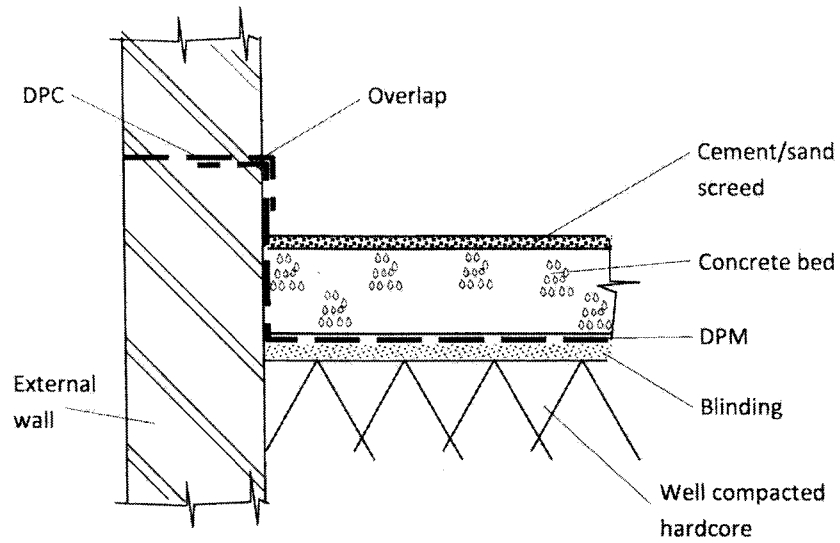
- compact the levelled natural ground
- lay kerbs and drainage channel
- lay and compact sand bedding to required fall
- lay paving slabs
- fill joints with mortar

Sketch = 2 marks

Explanation = 2 marks

(Accept other appropriate sketches) = 4 marks

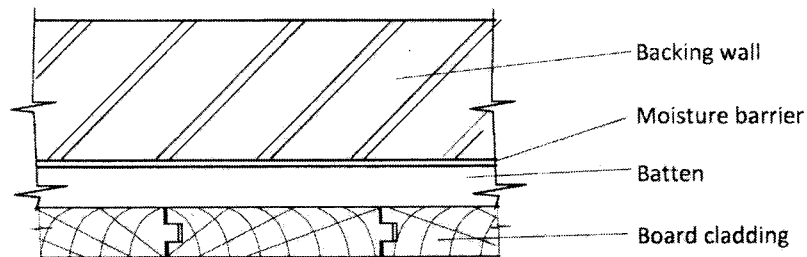
13. (a) **Damproofing details at function of floor slabs and external wall**



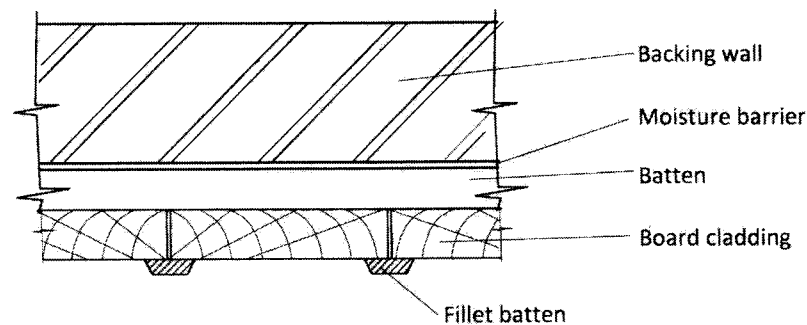
Sketch =  $2\frac{1}{2}$   
 Labels Any  $4 \times \frac{1}{2} = 2$   
 Damproofing - Correct DPC position =  $\frac{1}{2}$   
 - Correct DPM position =  $\frac{1}{2}$   
 - Overlap =  $\frac{1}{2}$   
6 marks

(b) **Methods of providing vertical timber cladding**

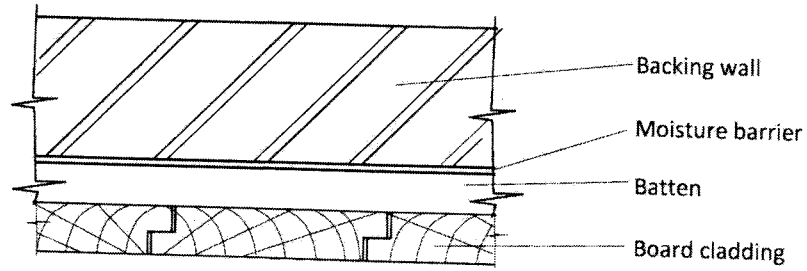
(i) **Tongue and groove**



(ii) **Using butt joint**



(iii) **Using rebated joint**



ANY TWO METHODS SKETCHED

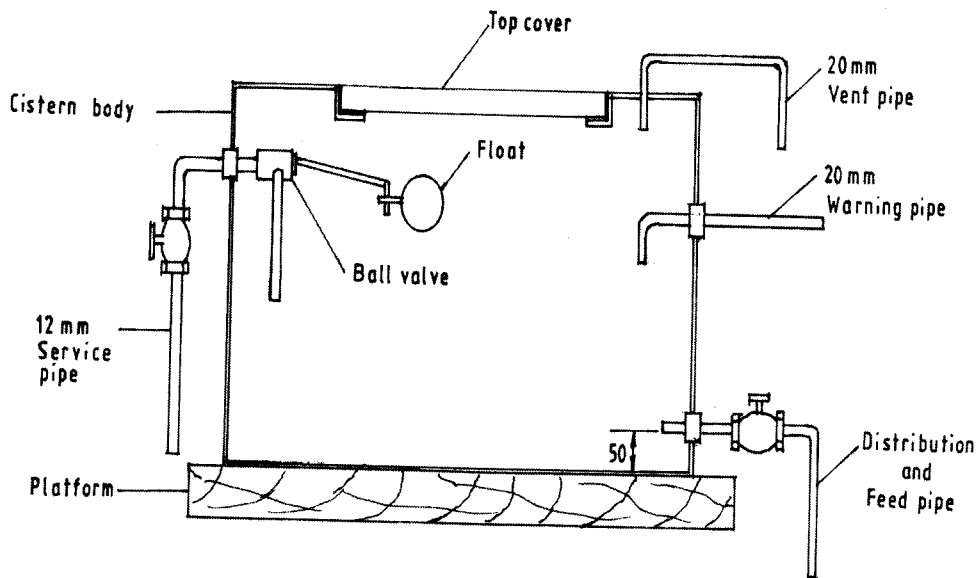
Method -  $2 \times \frac{1}{2} = 1$  mark

Sketch  $2 \times 2 = 4$  marks

Labels Any  $4 \times 2 \times \frac{1}{2} = 4$  marks

Total 9 marks

14. (a)

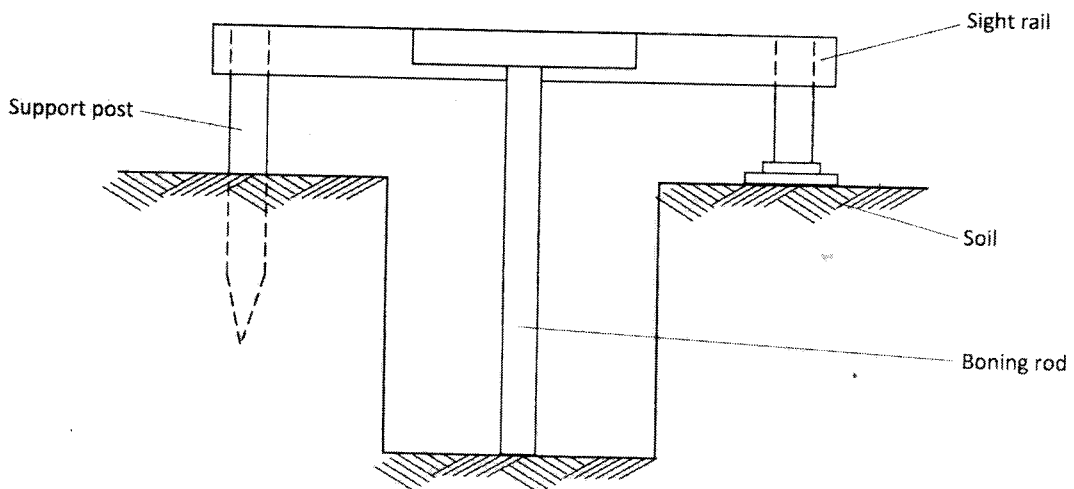


Sketching = 5 marks

Labelling Any  $8 \times \frac{1}{2} = 4$  marks

9 marks

(b)





Explanation

- (i) Establish level at sight rail
- (ii) Establish level at sighting rod
- (iii) Use travelling rod to establish intermediate levels

Sketching = 3 marks

Labels  $3 \times \frac{1}{2} = 1\frac{1}{2}$

Explanation -  $3 \times \frac{1}{2} = 1\frac{1}{2}$

6 marks

15. (a) **Procedure of obtaining a representative sample of sand:**

- (i) select a large sample from a given heap and pour it on a flat surface
- (ii) divide the sample into four equal parts (quarters)
- (iii) select diametrically diagonally opposite quarters and reject the test
- (iv) mix and pour the selected sample to form a cone
- (v) repeat the quartering procedure until a representative sample is obtained

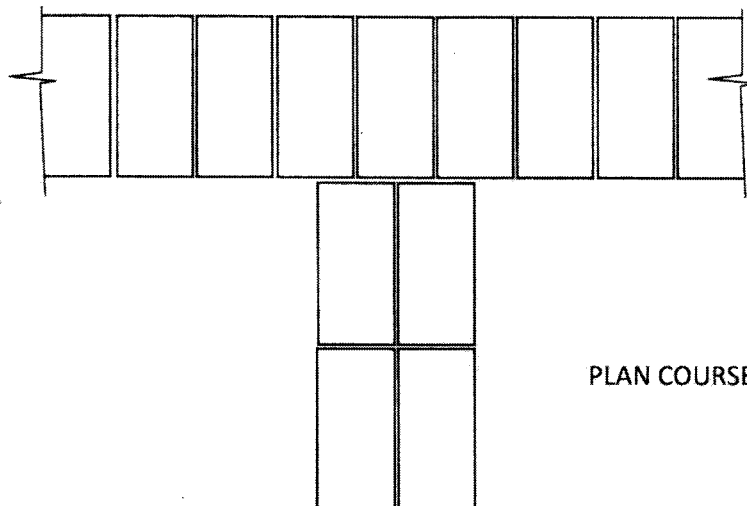
(5 marks)

(b) **Procedure of fixing trusses into position to form a roof:**

- (i) mark the position of the trusses
- (ii) place the trusses in the marked positions
- (iii) fix the end trusses plumb
- (iv) brace the trusses
- (v) tie the strings for alignment in order to align the remaining trusses into position
- (vi) fix the intermediate trusses into position with appropriate braces as you maintain the plumpness

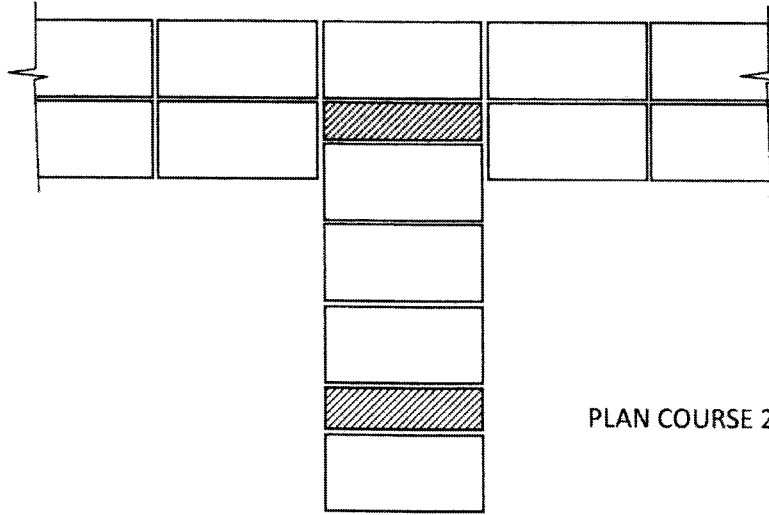
(4 marks)

(c)



PLAN COURSE 1

correct courses bonded ( $3 \times 2 = 6$  marks)



PLAN COURSE 2