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 ½ = 1 mark)

(b) Types of foundations:

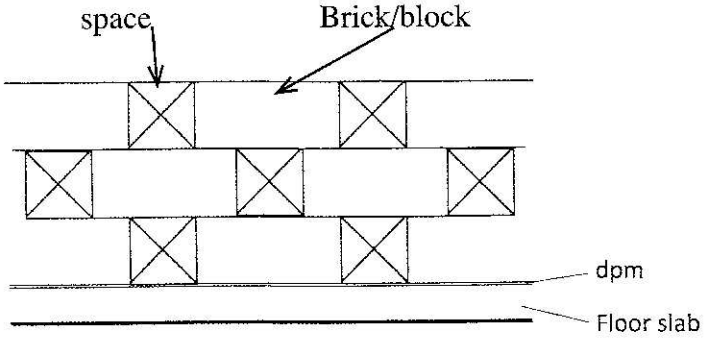
Name of foundation	Type of soil
Natural	Rock
Strip	Hard/firm soil
Pad	Hard/firm soil
Pile	Weak soil
Raft	Peat, wet clay soil
(Any 2 x ½ = 1 mark)	(Any 2 x ½ = 1 mark)

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 ½ = 1 mark)

(b) Honey comb wall:



Spaces - ½ mark
Correct bonding - ½ mark
Labels Any 4 x ½ = 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 ½ = 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 ½ = 1 mark)
Dependent e.g. putlog, cantilever (example 2 x ½ = 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 ½ = 2 marks)

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

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

(Any 2 x ½ = 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 ½ = 1½ marks)
(Functions 3 x ½ = 1½ marks)

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

(i) helmet
(ii) overall
(iii) overcoat/apron
(iv) boots
(v) muffles
(viI) goggles

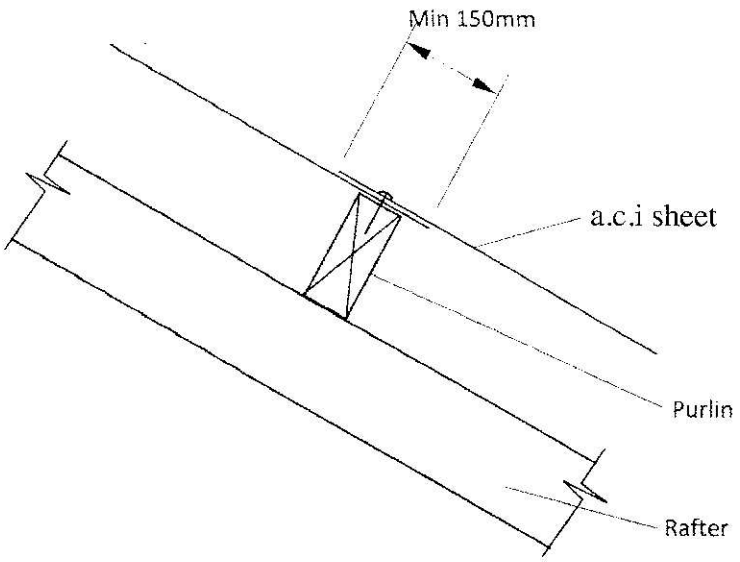
(Any 2 x ½ = 1 marks)

(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

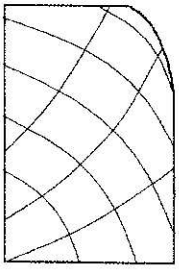
(Any 2 x 1 = 2 marks)

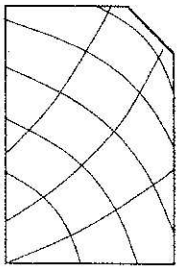
(b)



Sketch = 1 mark
Lap 150 min = ½
Nail Position = ½
(Total = 2 marks)

7. (a) SKIRTINGS - treatment to edges





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

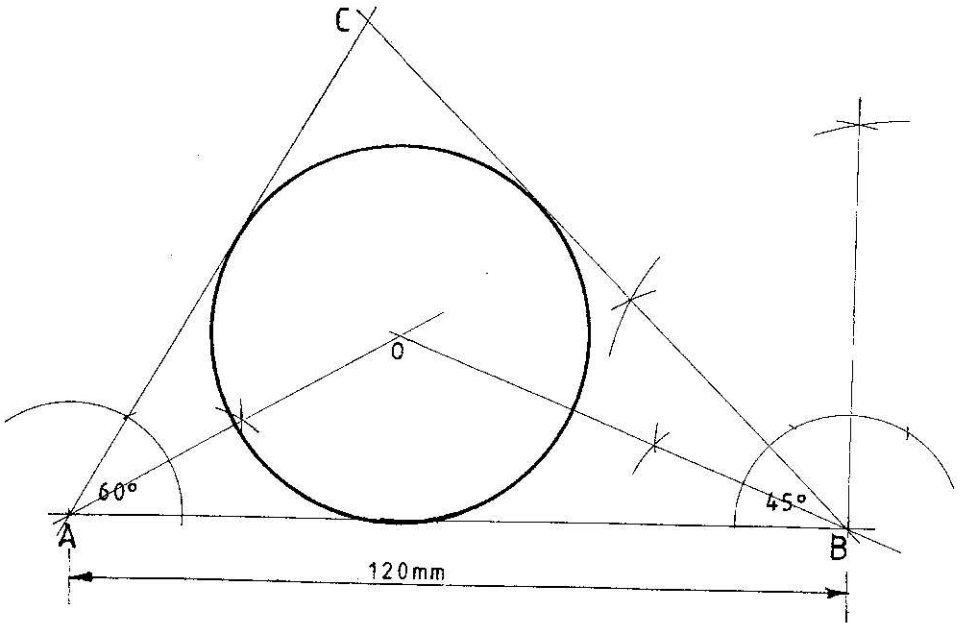
(ii) fixing of brandering and ceiling

(iii) supporting the water cistern

(iv) supporting service pipes for water and electricity

for (Any 2 x 1 = 2 marks)

10.

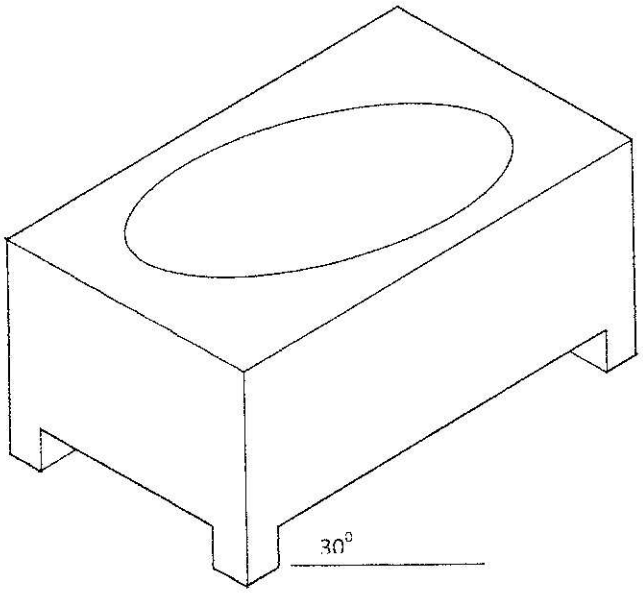


Construction

Line AB = 120mm	= ½ mk
$C\hat{A}B$ = 60°	= ½ mk
$C\hat{B}A$ = 45°	= ½ mk
Point C	= ½ mk
Bisectors at A&B	= 1 mk
Inscribed circle	= 1 mk
	4 mks

11.

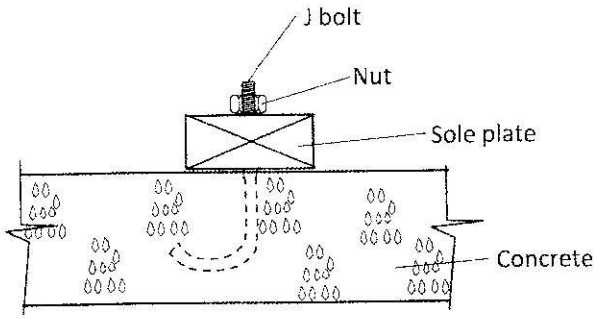
- 6 surfaces		Any 6 x ½ =	3 marks
- Construction details			2 marks
- Isometric			1 mark
- Ellipse	- major axis	2 offsets (2 x ½) =	1 mark
	- minor axis	2 offsets (2 x ½) =	1 mark
	- smooth curve of ellipses		2 marks
- Taper on 4 edges		4 x ½ =	2 marks
- Correct scale	(1:1)		1 mark
- Outlines (bold)			1 mark
- Lowest point 'X'			1 mark
	TOTAL		15 marks



SECTION B

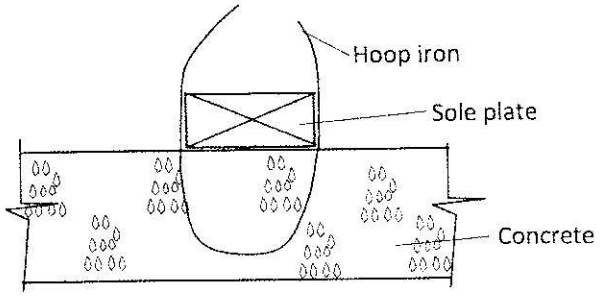
12. (a) Methods of anchoring the sole plate of a timber wall frame:

(i) using J-bolt



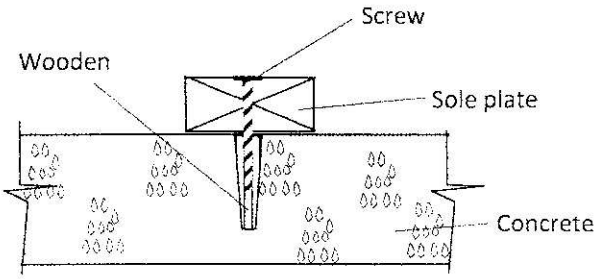
- mark the position of the sole plate
- cap the J-bolt in position during concreting
- mark the position of bolt on the sole plate and drill
- plug and fix sole plate with nuts

(ii) using strap/hoop irons:



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

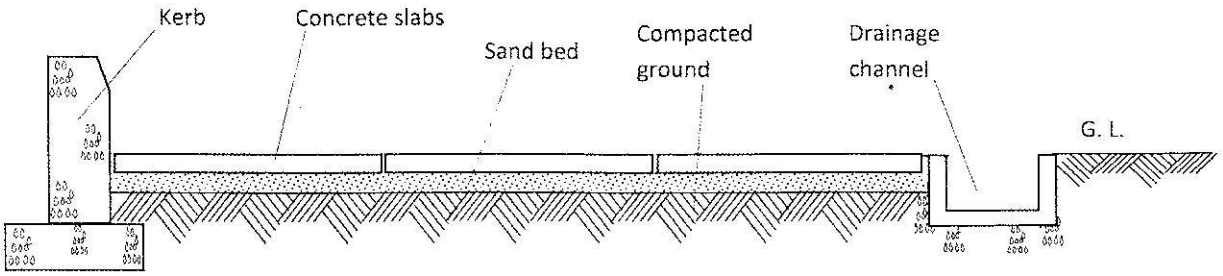
(iii) using wooden plug:



- 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 = ½
Sketch = 2½
Labels = 2 x ½ = 1
Explanation = 3 x ½ = 1½
5½
Any 2 x 5½ = (11 marks)

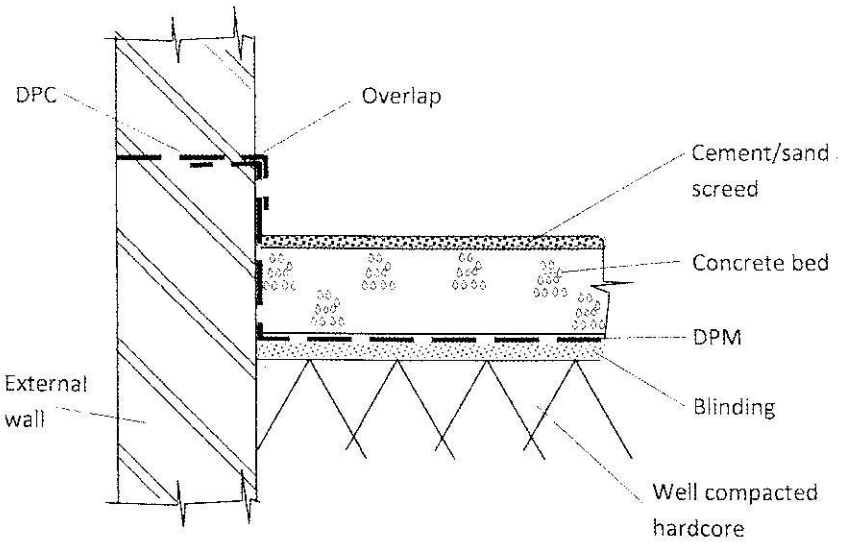
(b) Public Footpath



(i) compact the levelled natural ground
(ii) lay kerbs and drainage channel
(iii) lay and compact sand bedding to required fall
(iv) lay paving slabs
(v) fill joints with mortar

Sketch = 2 marks
Explanation = 2 marks
(Accept other appropriate sketches) = 4 marks

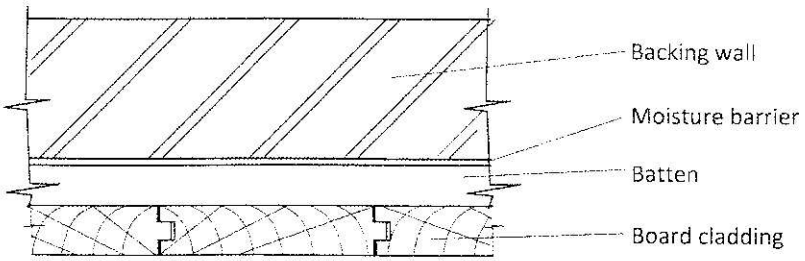
13. (a) Damproofing details at function of floor slabs and external wall



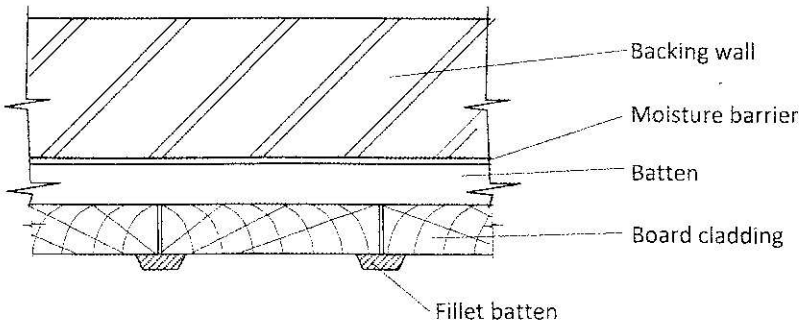
Sketch = 2½
Labels Any 4 x ½ = 2
Damproofing - Correct DPC position = ½
- Correct DPM position = ½
- Overlap = ½
6 marks

(b) Methods of providing vertical timber cladding

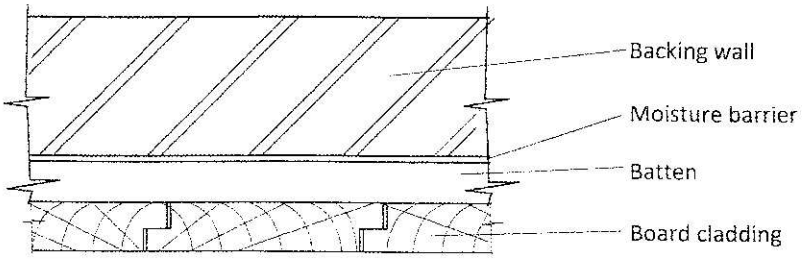
(i) Tongue and groove



(ii) Using butt joint

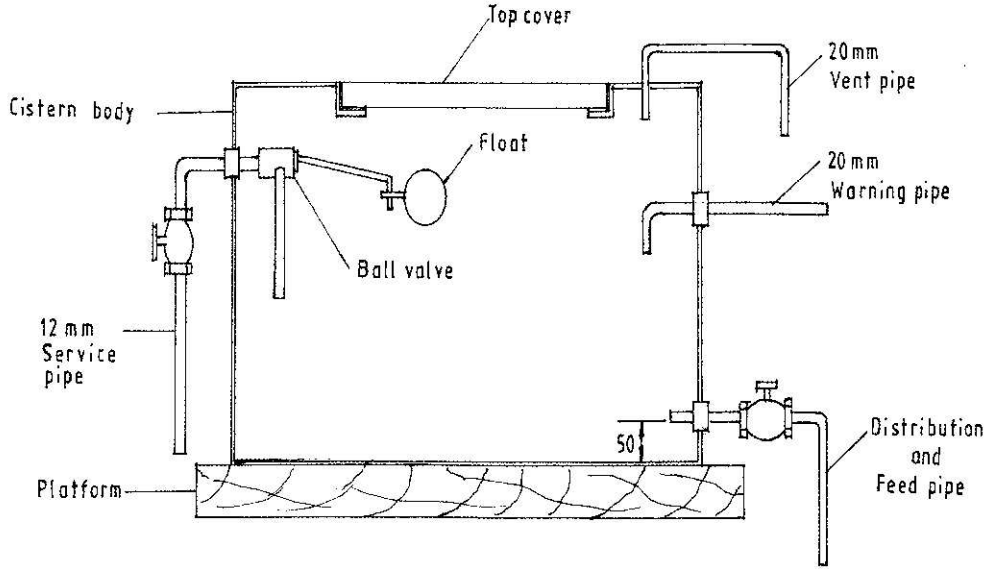


(iii) Using rebated joint



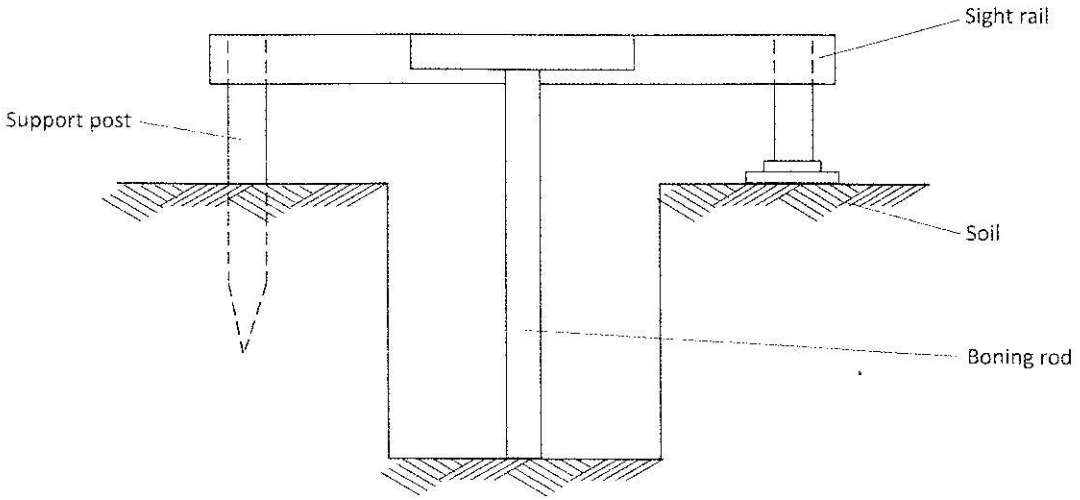
ANY TWO METHODS SKETCHED
Mthod - 2 x ½ = 1 mark
Sketch 2 x 2 = 4 marks
Labels Any 4 x 2 x ½ = 4 marks
Total 9 marks

14. (a)



Sketching = 5 marks
Labelling Any 8 x ½ = 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 x ½ = 1½
Explanation - 3 x ½ = 1½
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

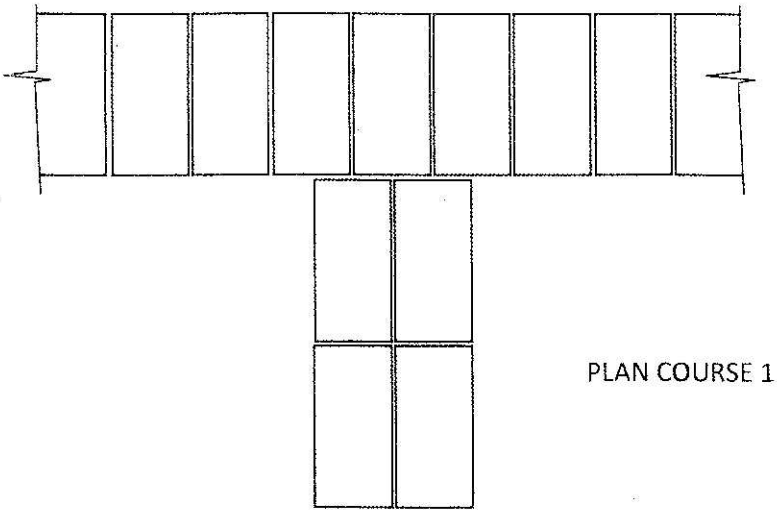
(5 marks)

(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

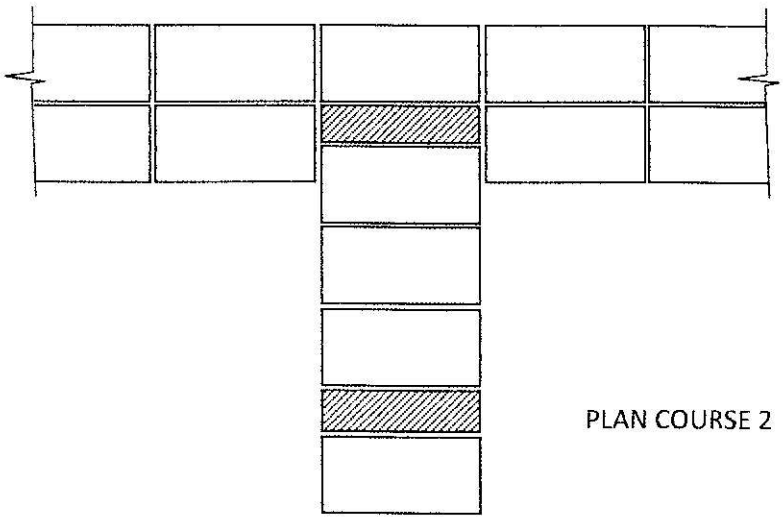
(4 marks)

(c)



PLAN COURSE 1

correct courses bonded (3 x 2 = 6 marks



PLAN COURSE 2