

4.18 BUILDING CONSTRUCTION (446)

4.18.1 Building Construction Paper 1 (446/1)

1 TOOLS

- Builders' square
- Mason's square.

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

EQUIPMENT

- Sight square.
- Dumpy level.
- Surveyor's square.

Any $2 \times \frac{1}{2} = 1$ mark

2. Types of foundation:

- Shallow foundation.

Are those foundation which transfer $\left(\frac{1}{2}\right)$ the loads to a subsoil $\left(\frac{1}{2}\right)$ at a point near the ground floor of a building. $\left(\frac{1}{2}\right)$

$1\frac{1}{2}$ marks

Examples: - Strip foundation. - Raft foundation.
 - Natural foundation. - Poled foundation.

Accept any other correct example.

Any $2 \times \frac{1}{2} = 1$ mark

- Deep foundation

These are foundations that transfer $\left(\frac{1}{2}\right)$ loads to a subsoil some $\left(\frac{1}{2}\right)$ distance below $\left(\frac{1}{2}\right)$ the ground floor of the building.

Any $2 \times \frac{1}{2} = 1$ mark

Examples: - Deep strip foundation. - Pile foundation.
 - Pad foundation.

Accept any other correct example.

Any $2 \times \frac{1}{2} = 1$ mark

3. Reasons why clay tiles are not commonly used as roof coverings.

- Expensive in terms of maintenance.
- Expensive to purchase.
- Not easily available.
- Needs an expert to lay.
- Needs keenness to transport since they are brittle.
- Shape and colour of tiles can be obtained in iron sheets.

Any $4 \times 1 = 4$ marks

4. **Four** undesirable effects of dampness in buildings.

- Paint peeling off.
- Humid atmosphere in rooms.
- Efflorescence effect.
- Effect on timber skirtings.
- Effect of carpets.
- Encourages wet rot.
- Encourages fungal growth on structure.

Any 4 x $\frac{1}{2}$ = 2 marks

5. (a) **Four** requirements of a drainage system.

- Should be self cleansing.
- Should be straight as possible between two points.
- Pipes used should be strong enough to resist the pressures placed on them.
- The bore should be laid true and smooth to ensure that water flows freely.
- Gradient should be correctly set such that water velocity is maintained which ensures solid matter will be floated along the pipe.
- Should operate without maintenance.

Any 4 x 1 = 4 marks

(b) Use of a goose neck bend.

It is used to relieve pressure likely to be exerted on the mains connection.

1 mark

6. (a) Limitations in starting a small business in building construction are:

- Taxes.
- Acquisition of equipment and machines.
- Local authority by-laws.
- Licences (registration)
- Starting up capital.
- Location of business.

Any 4 x $\frac{1}{2}$ = 2 marks

(b) - Standard: The upright member of a scaffold on to which ledgers, transoms and braces are fixed.

- Guard rail: A horizontal member above the platform which is fixed on the standards to prevent workers from falling off the scaffold.

2 x 1 = 2 marks

7. (a) Two requirements for an appropriate safety helmet to be worn in a construction site are:
- (i) should be hard, not to break easily.
 - (ii) should have soft inner padding.
 - (iii) should have strapping.

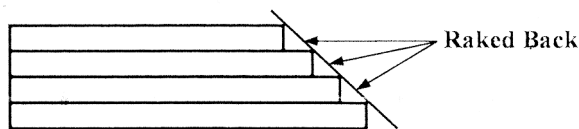
Any 2 x 1 = 2 marks

- (b) Ways through which moisture can enter a building:

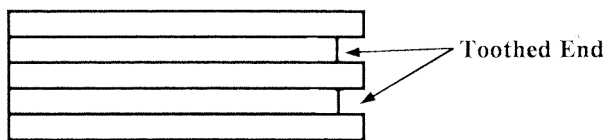
- (i) By rain penetrating the head of the wall and soaking down into the building below the roof level.
- (ii) By rain hitting against the external wall and soaking through the fabric into the building.
- (iii) By the ground moisture entering the building at or near the base and creeping up the wall by capillarity action and entering the building above the ground.

Any 2 x 2 = 4 marks

8. (a)



- (b)



Sketch 2x 1 = 2 marks

Labels 2 x 1 = 2 mark

4 marks

9. (a) Reconditioning of a cold chisel.

Grind the mushroomed head on the sides until flat with the stem of the chisel. Then grind the end a little to reveal a flat surface on which to hammer.

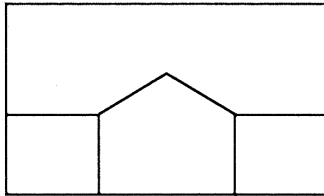
2 marks

- (b) Joint A: Weather struck pointing. It drains off rain water easily.

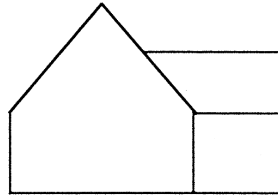
Joint B: Concave pointing. It gives a decorative beautiful finish.

2 x 1 = 2 marks

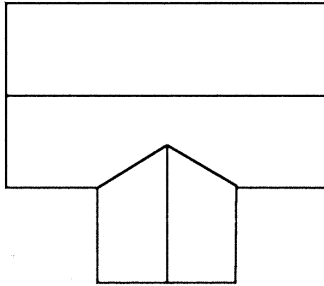
10.



FRONT ELEVATION



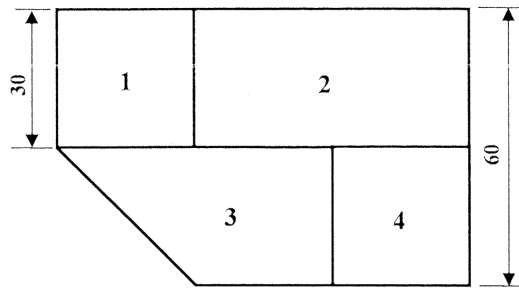
END ELEVATION



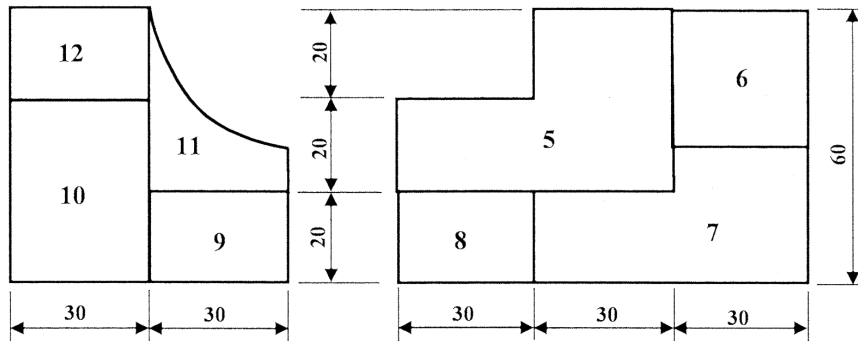
PLAN

3 Views (3×1) = 3 Marks
 Correct 1st Angle = 1 Marks
 Total = 4 Marks

11.



PLAN



END ELEVATION

FRONT ELEVATION

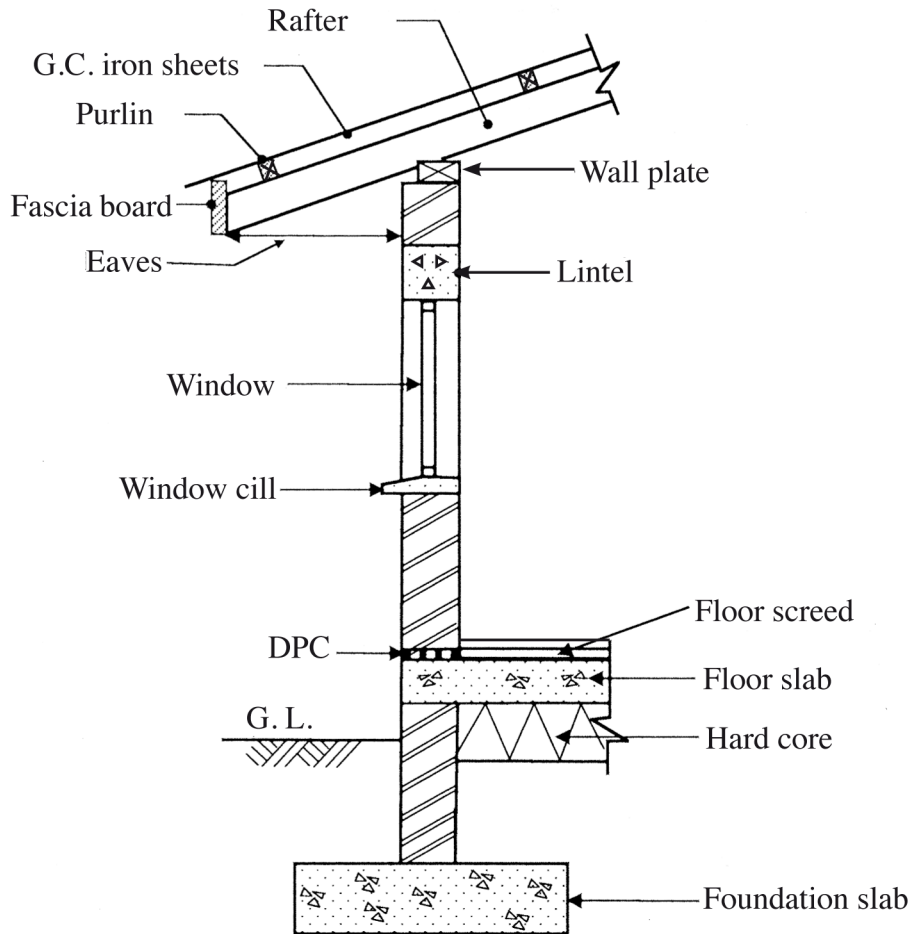
3rd angle projection = 1 mark
 12 faces @ $\frac{1}{2}$ = 6 marks
 6 dimensions @ $\frac{1}{2}$ = 3 marks
 Naming the views = 1 mark
 Curve correctly drawn = 1 mark
 Lines drawn correctly = 2 marks
Equal spacing of views = 1 mark
 TOTAL = 15 marks

12. (a) Functional requirements of walls are;

- Safely transfer imposed loads to the foundation.
- Prevent penetration of moisture from outside.
- Retain heat within.
- Insulate against heat from outside.
- Fire resistance.
- Resistant to weather elements like wind.

Any 5 x 1 = 5 marks

(b)



Sketch	=	5 marks
Labels (any 10 x $\frac{1}{2}$)	=	5 marks
<u>(Accept other eaves detail)</u>		
TOTAL	=	10 marks

13. (a) (i) Advantages of twisted bars over round bars.

- Twisted bars provides better grip due to increased surface area and also increases friction.
- Higher strength.

(ii) 8 Y 20 – 01 – 300 B
↑ ↑ ↑ ↑ ↑ ↑
A B C D E F

- A - Number of bars.
- B - Type of bar/shape of bar.
- C - Bar diameter.
- D - Bar mark diameter.
- E - Pitch of bars (centre to centre spacing).
- F - Position of bars (bottom)

6 x 1 = 6 marks

(b) Functions of the following:

(i) Cold water cistern

- Receives water from the water supply/rising main.
- Stores water for use in other water cistern.
- Supplies the water heater.

(ii) Water cylinder

- Stores hot water for use in the house.

(iii) Boiler

- Can either be manual or electrical and is used for heating water.

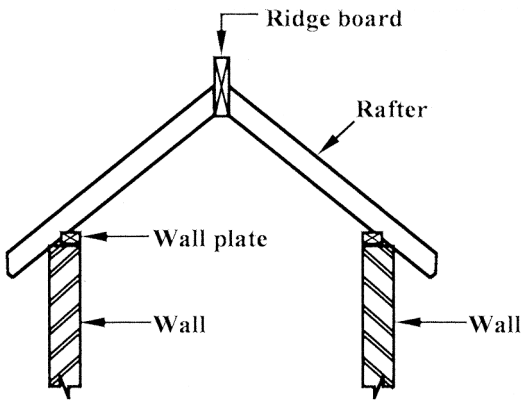
(iv) Rising mains

- Connects the meter to the overhead storage tank and the kitchen valve.

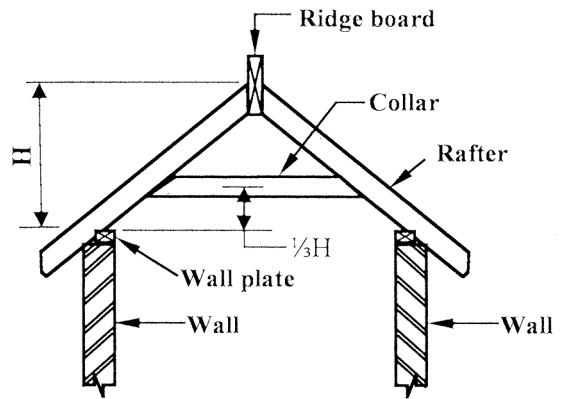
4 x 2 = 8 marks

14.

(a)



COUPLE ROOF



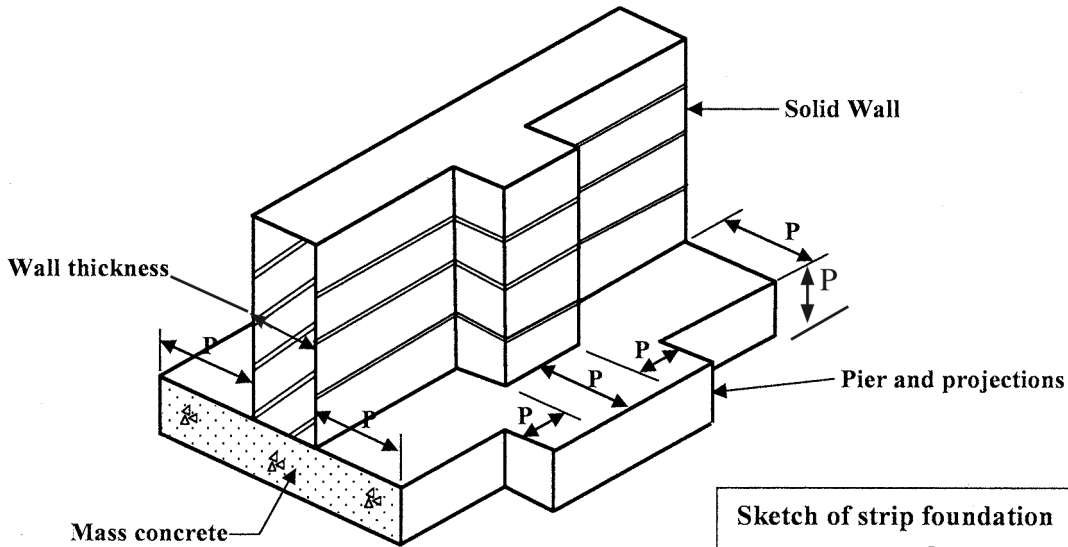
COLLAR ROOF

Sketch: 2×2 = 4 marks

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

TOTAL = 8 marks

(b)



Sketch of strip foundation = 3 marks

Labels: Any 2×2 = 2 marks

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

TOTAL = 7 marks

15. (a) Functions of

Blinding:

- provide a firm surface.
- prevent loss of cement grout
- provide a firm surface for laying reinforcement and dpm.

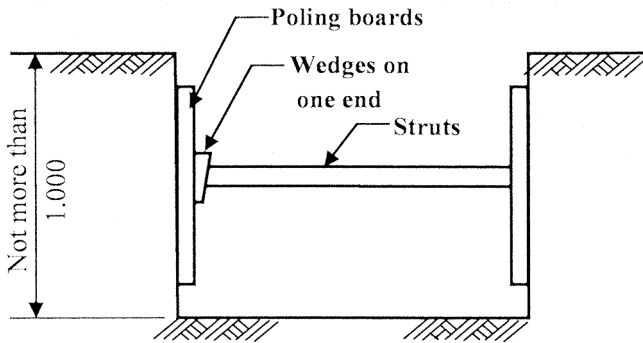
Any 2 x 1 = 2 marks

Hard core:

- act as backfill.
- reduces rising dampness by capillarity.
- raises the ground floor level.

Any 2 x 1 = 2 marks

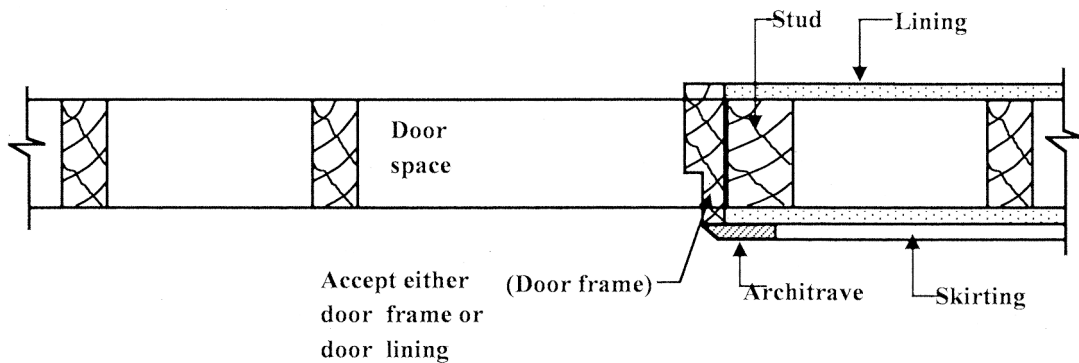
(b)



Timbering in hard soils

Sketch	= 3 marks
Labels: Any $4 \times \frac{1}{2}$	= 2 marks
TOTAL	= 5 marks

(c)



Sketch	= 4 marks
Labels: Any $4 \times \frac{1}{2}$	= 2 marks
TOTAL	= 6 marks