4.18 BUILDING CONSTRUCTION (446)

4.18.1 Building Construction Paper 1 (446/1)

1   TOOLS

- Builders' square
- Mason's square.

$$2 \text{ x } \tfrac{1}{2} = 1 \text{ mark}$$

EQUIPMENT

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

$$\text{Any } 2 \text{ x } \tfrac{1}{2} = 1 \text{ mark}$$

2.   Types of foundation:

- Shallow foundation.

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

$$1\tfrac{1}{2} \text{ marks}$$

   Examples: - Strip foundation.   -   Raft foundation.
            - Natural foundation.   -   Poled foundation.
         Accept any other correct example. $\text{Any } 2 \text{ x } \tfrac{1}{2} = 1 \text{ mark}$

- Deep foundation

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

   Examples: - Deep strip foundation.   - Pile foundation.
            - Pad foundation.
         Accept any other correct example. $\text{Any } 2 \text{ x } \tfrac{1}{2} = 1 \text{ mark}$

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.

$$\text{Any } 4 \text{ x } 1 = 4 \text{ marks}$$

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, transforms 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 worm in a construction site are:

          (i)   should be hard, not to break easily.
          (ii)   should have soft inner padding.
          (iii)   should have strapping.
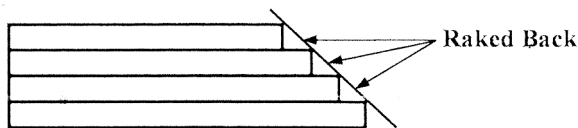
<div align="right">Any 2 x 1 = 2 marks</div>

   (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.

<div align="right">Any 2 x 2 = 4 marks</div>

8.   (a)

Raked Back

   (b)

Toothed End
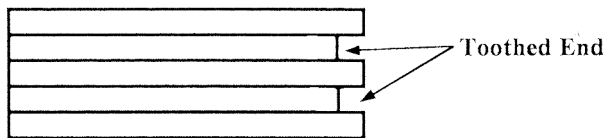
<div align="right">Sketch 2x 1 = 2 marks
Labels 2 x 1 = 2 mark
4 marks</div>

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.

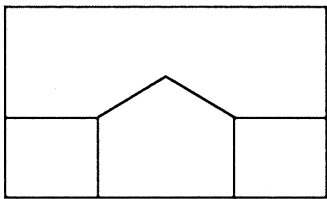<div align="right">2 marks</div>

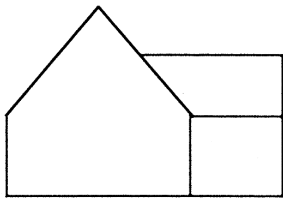   (b)   Joint A: Weather struck pointing. It drains off rain water easily.

           Joint B: Concave pointing. It gives a decorative beautiful finish.
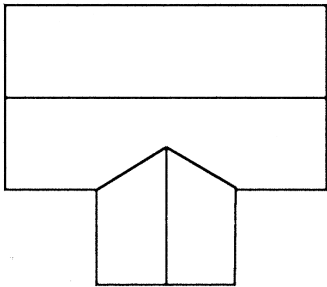
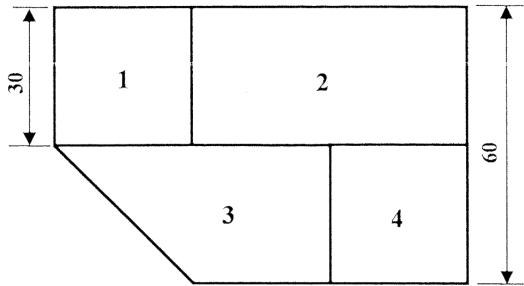<div align="right">2 x 1 = 2 marks</div>

10.

FRONT ELEVATION
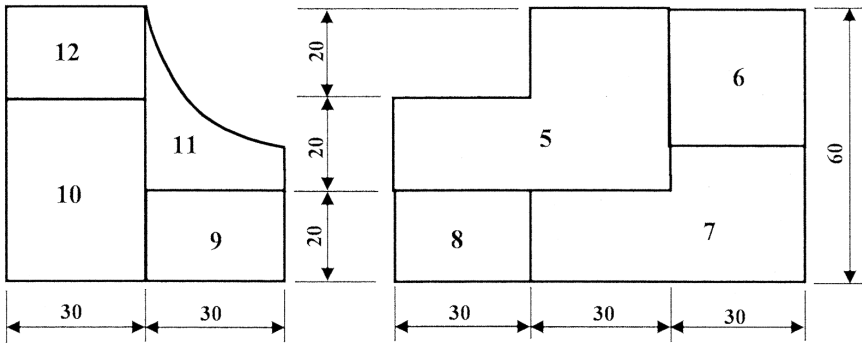
END ELEVATION

PLAN

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

11.

30

60

1

2

3

4

PLAN

12

11

10

9

30

30

END ELEVATION

20

20

20

6

5

8

7

30

30

30

60

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

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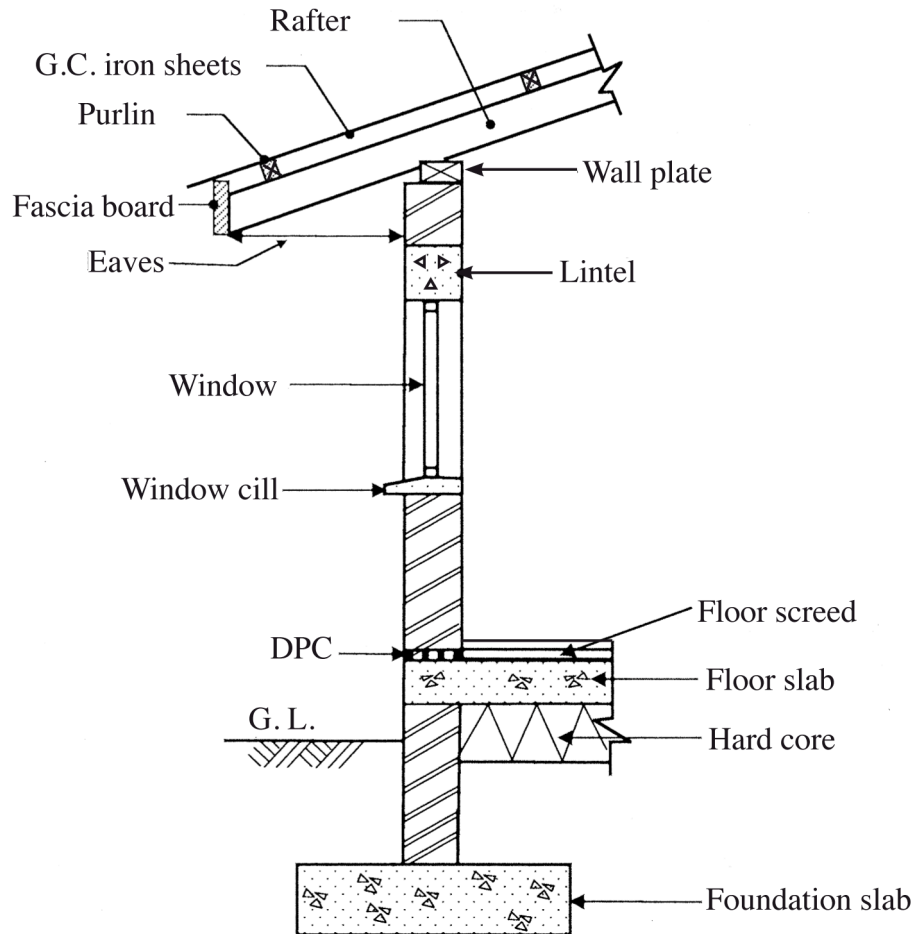
Sketch	=	5 marks
Labels (any 10 x $\frac{1}{2}$)	=	5 marks
(Accept other eaves detail)		
TOTAL	=	10 marks

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

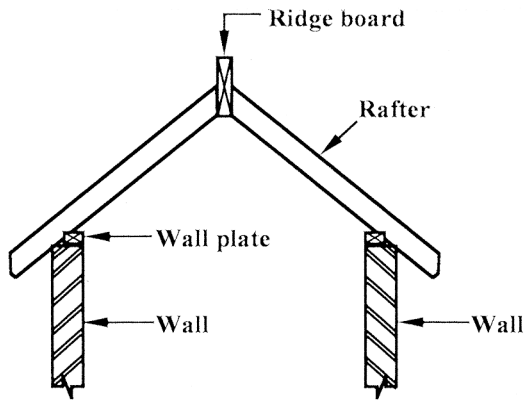- Can either be manual or electrical and is used for heating water.

(iv)   Rising mains

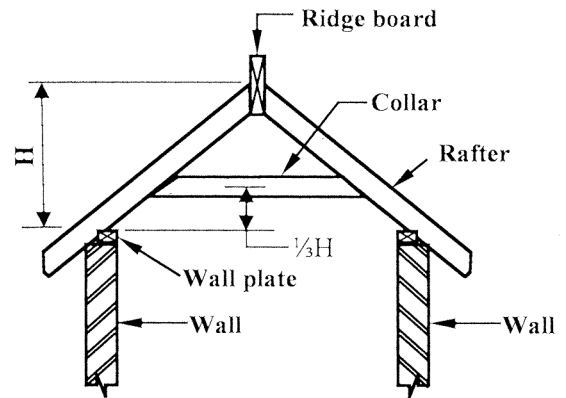- Connects the meter to the overhead storage tank and the kitchen valve.
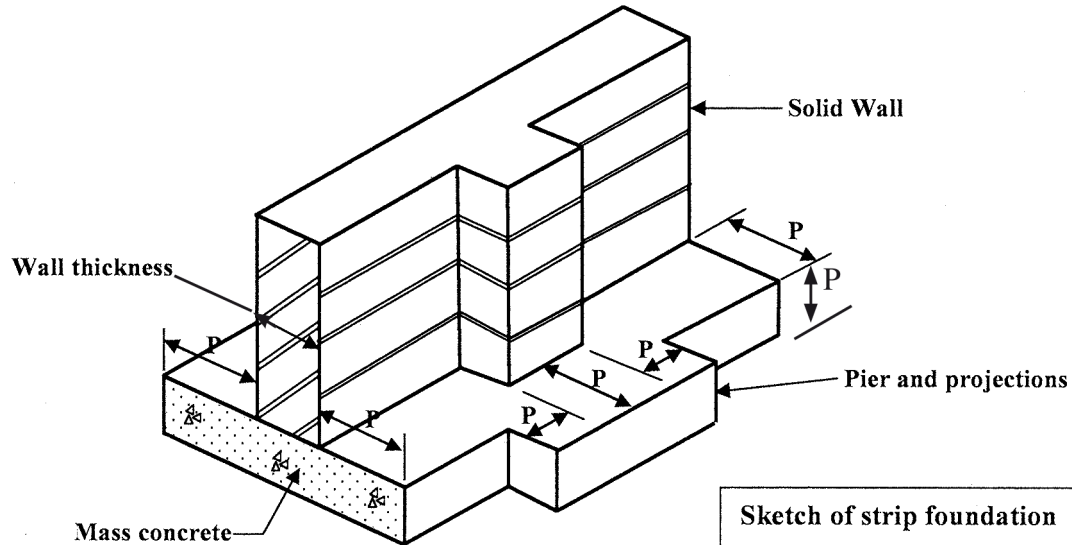
4 x 2 = 8 marks

14.

(a)

COUPLE ROOF

COLLAR ROOF

Sketch: 2×2	= 4 marks
Labels: any 4×2×½	= 4 marks
TOTAL	= 8 marks

(b)

Sketch of strip foundation	= 3 marks
Labels: Any 2×2	= 2 marks
Projections: Any 4×½	= 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.
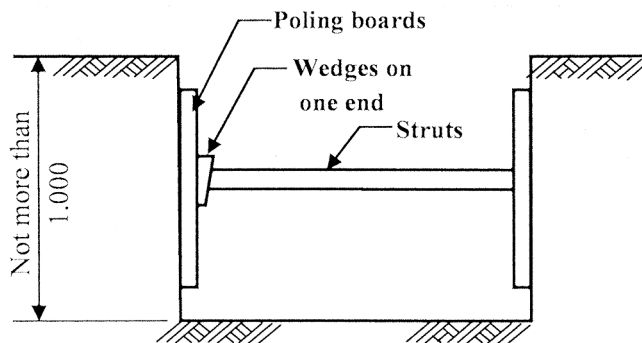
Any 2 x 1 = 2 marks

Hard core:

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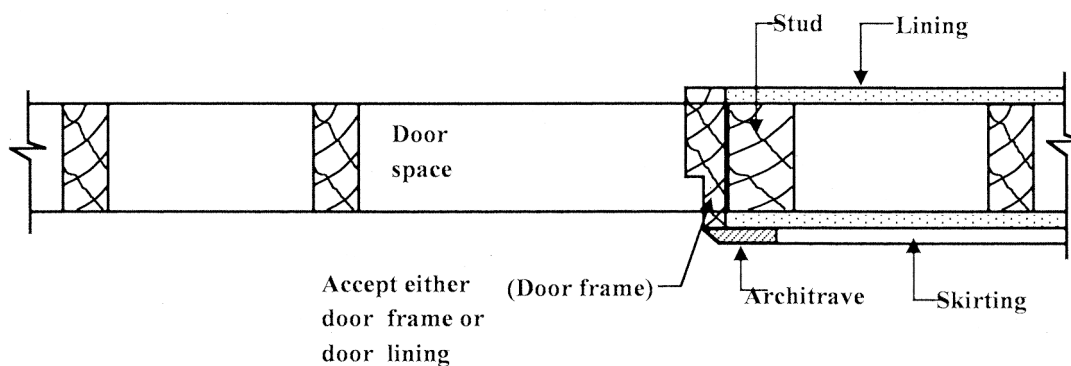- raises the ground floor level.

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

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