**MARKING SCHEME**

**BUNAMFAN CLUSTER EXAMINATION 2021**

**446/1**

**BUILDING CONSTRUCTION**

**PAPER 1**

**2 ½ Hours**

**December 2021**

**INSTRUCTIONS TO CANDIDATES**

(a) Write your **name** and **index number** in the spaces provided above.

(b) Sign and write the date of examination in the spaces provided above.

(c) Candidates should have the following for this examination:

- Drawing paper size A3

- Drawing Instruments

-Scientific Calculator

(d) This paper consists of two sections; A and B.

(e) Answer **all** questions in **section A** in the spaces provided.

(f) From **section B**, answer **question 11** on **A3 paper** and any **other three questions** in the spaces provided.

(g) All dimensions are in millimeters unless otherwise stated.

(h) This paper **consists of 11 printed pages**.

(i) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

(j) Candidates should answer the questions in English.

***For Examiner’s Use Only***

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Question** | **Maximum**  **Score** | **Candidate’s**  **Score** |
| **A** | **1-10** | **40** |  |
| **B** | **11** | **15** |  |
| **12** | **15** |  |
| **13** | **15** |  |
| **14** | **15** |  |
| **15** | **15** |  |
|  |

**Total Score**

**SECTION A** (40 marks)

*Answer* ***all*** *questions in this section in the spaces provided.*

1. (a) Define the term “shelter” (1 mark)

-Is an enclosure which excludes weather elements, provides security and privacy.

(Correct explanation 1 mark)

(b) Name two tools and two equipment used for setting out a right angle of a building.

-tools

-builders square

-Manson’s square

-equipment

-sight square

-dumpy level

-surveyor’s square

(Any 4x ½ =2 marks)

2. (a) Name two areas where a building line can be measured from.

-Existing building

-Kerb line (road)

-Center line of the road

(Any 2x ½ =1)

(b) Give two reasons why the current traditional houses are better than caves.

-better living conditions.

-caves had no option of design.

-caves are not found everywhere.

(Any 2x ½ =1)

3. (a) Give two components of a business plan.

-executive summary

-Business description

-Financial information.

-product and services

-Sales and marketing.

(Any 2x 1 =2)

(b) Outline three qualities of each of the following safety attire.

(i) Boots

-hard soles

-rubber soles

-metal toe caps

(ii) Helmet

-Hard material

-Covers the whole head

-Cushioned inside

-Neck strap.-bright coloured.

(Any 6x ½ =3)

4. (a) Describe the following types of foundations and give two examples in each case.

(i) Shallow foundation

-Are those foundations which transfer the loads to subsoil at a point near the ground floor of a building.

Examples-strip foundation

-natural foundation

-raft foundation

-poled foundation.

(ii) Deep foundations

These are foundations that transfer loads to subsoil some distance below the ground floor of the building.

Examples -pad foundation.

-Deep strip foundation

-Pile foundation

(Correct explanation 1 mark)

(Examples 4x ½ =2 marks)

Total= 3 marks

(b) State the function of a goose neck bend in a cold water service layout.

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

(Correct explanation 1 mark)

5. (a) State four places where vertical damp proof courses are used.

-Reveals on doors and window openings

-Retaining walls

-Internal faces of walls enclosing laundry and dry cleaning areas.

-On tanking in basements.

(Any 4x 1 =2marks)

(b) Describe two ways through which moisture can penetrate a building.

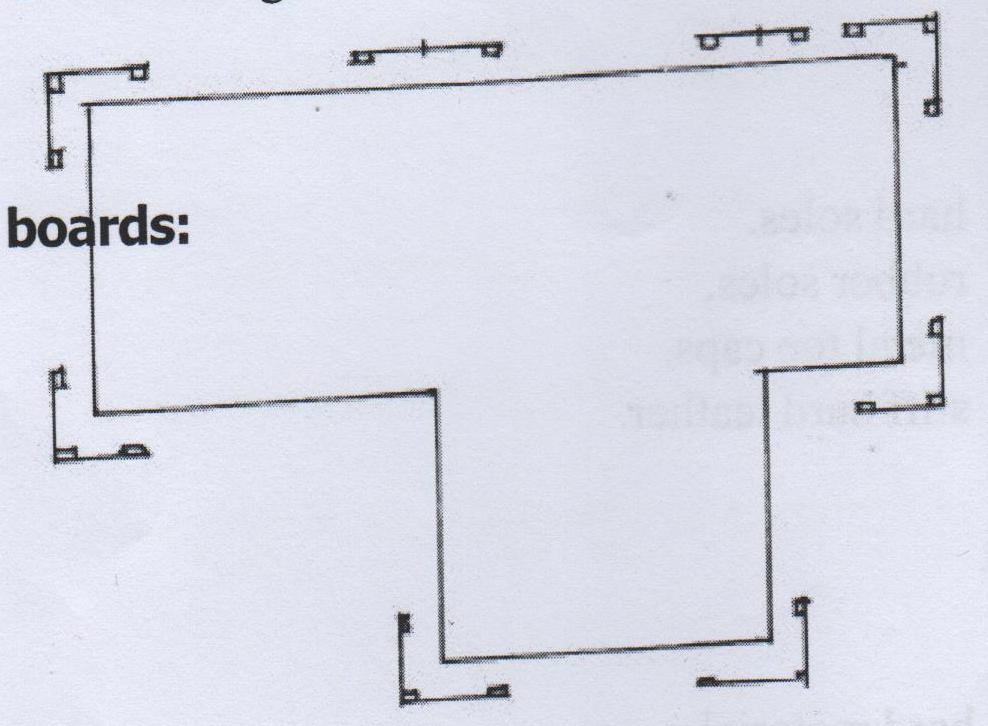
-By rain penetrating the head of the wall and soaking down into the building below the roof level.

-By rain hitting against the external wall and soaking through the fabric into the building.

-By the ground moisture entering the building at or near the base and creeping up the wall by capillary action and entering the building above the ground.

(Any 2x ½ =1nark)

6.

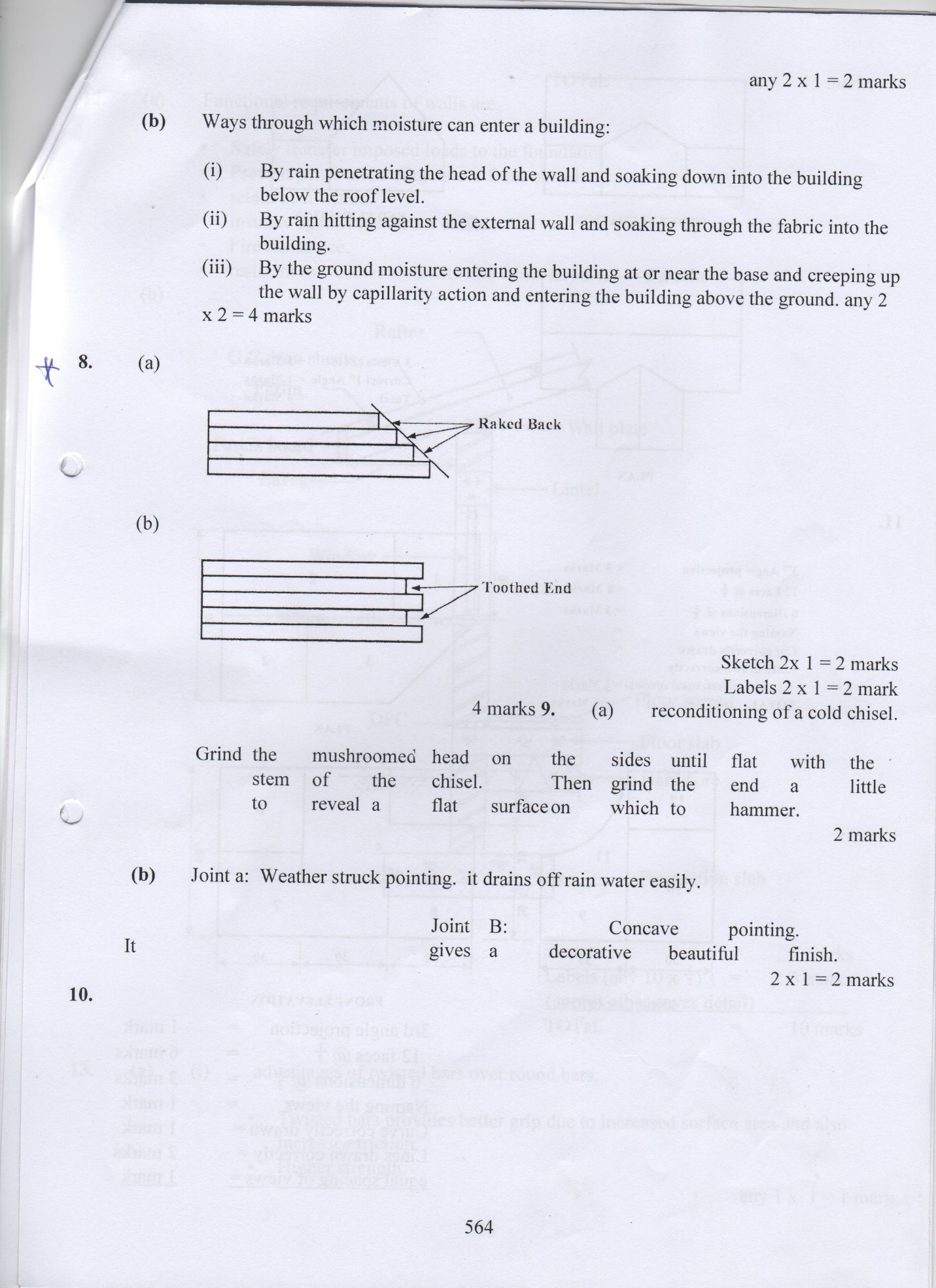


(Any 8x ½ =4 marks)

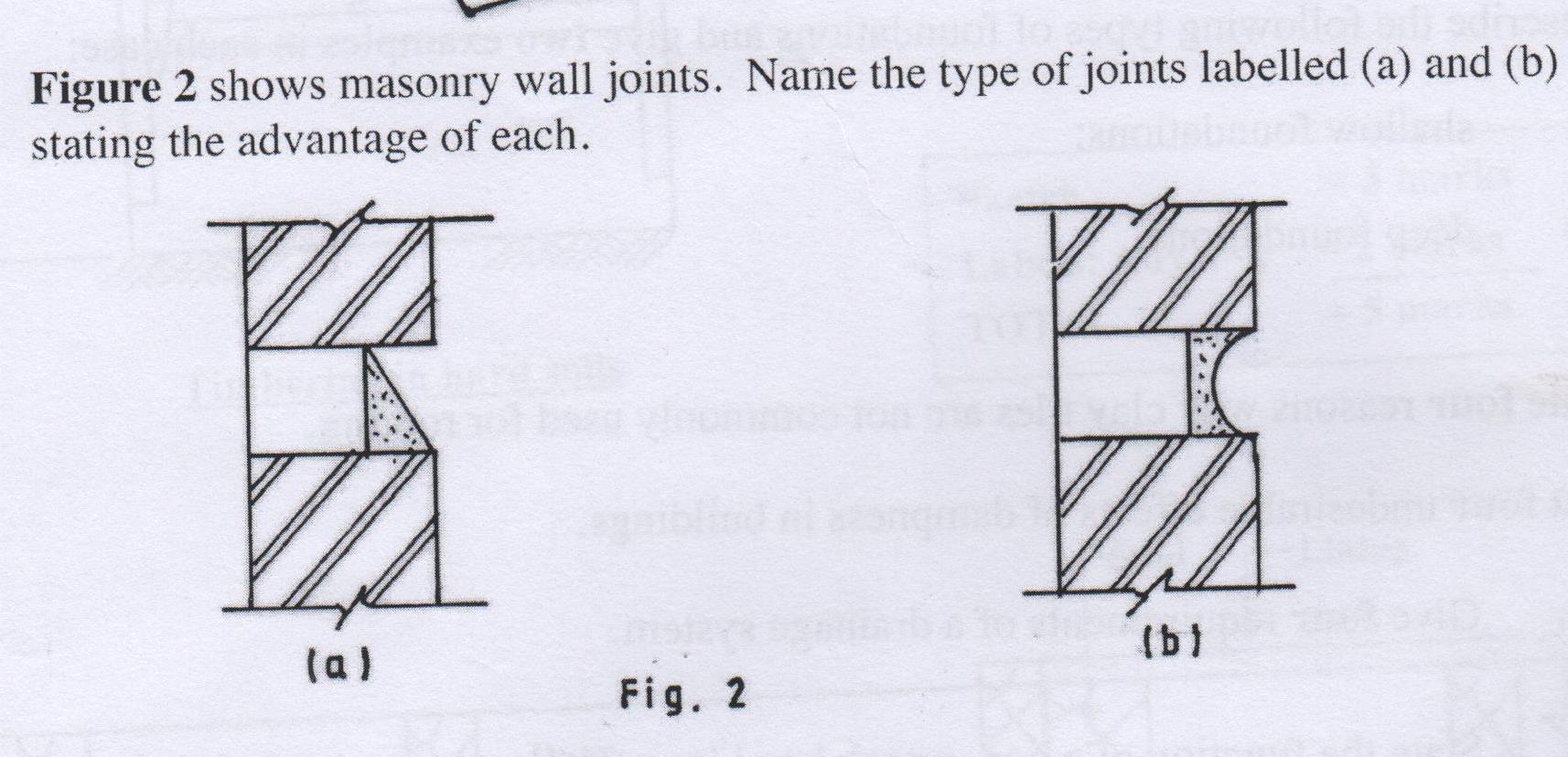
7. (a) Use labeled sketches to show the following features on a wall:

(i) Raking back

(ii) Toothing.



(b) Figure 2 shows masonry wall joints. Name the type of joints labeled (a) and (b) stating the advantage of each.



(a) Name: weather struck pointing,

Advantage: it drains off rain water easily

(b) Name: concave pointing.

Advantage: gives a decorative/ beatify finish

(Any 4x ½ =2 marks)

8. (a) list two roof covering materials for each of the following types of flat roofs.

(i) Concrete flat roof.

-build up roofing felt.

- Stone chippings mixed with tar,

-sloping screed.

(ii) Timber flat roof.

-Two coat asphalt,

- Aluminum paint on asphalt,

-Sheet metal work..

(Any 4x ½ =2 marks)

(b) State two conditions necessary when installing pipes to convey hot water.

- Pipe lengths should be short

- Related appliances should be kept in close proximity

- Joints should be water tight.

- Vertical pipes should be at 90 degrees to the horizontal

(Any 2x ½ =1 mark)

9. (a) Explain the use of pipe fittings in a pipe installation. (Give two)

- Make reduction to the diameter of pipes.

- Extend the length of pipe work.

-Change the diameter of pipe work.

-change direction

(Any 2x1 =2 marks)

(b) State two factors to be considered when sitting a septic tank.

- Possibility of connecting septic tank sewerage works later.

- Consider water table.

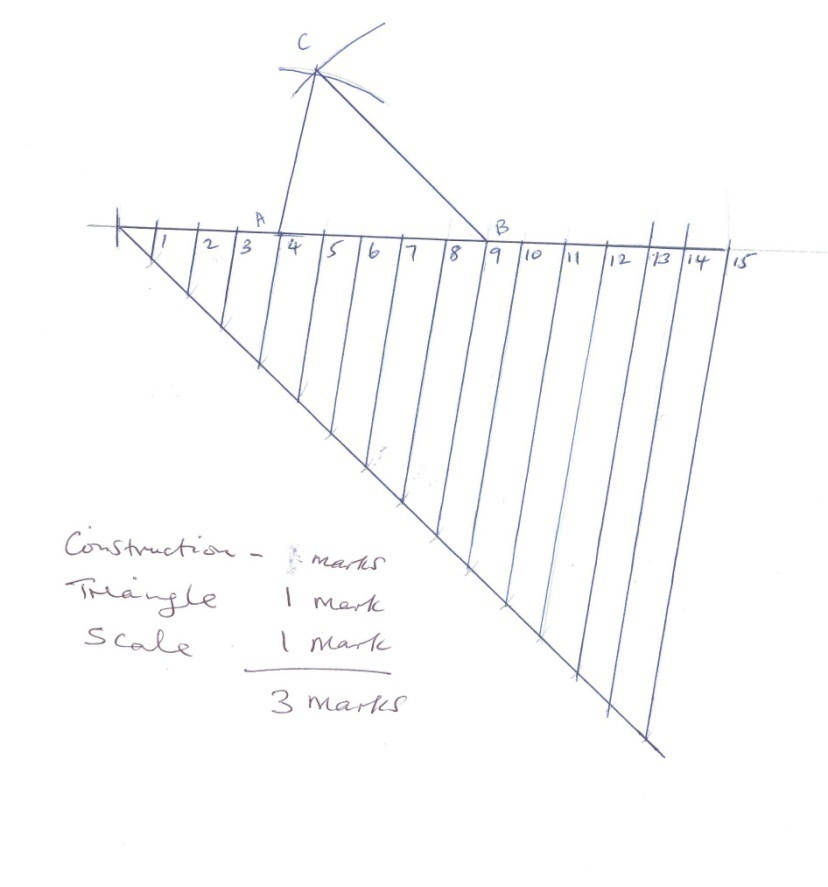
- Distance from houses.

- Nearby rivers, streams and flooding risks.

-Check availability of labour for maintenance and operation

(Any 2x1 =2 marks)

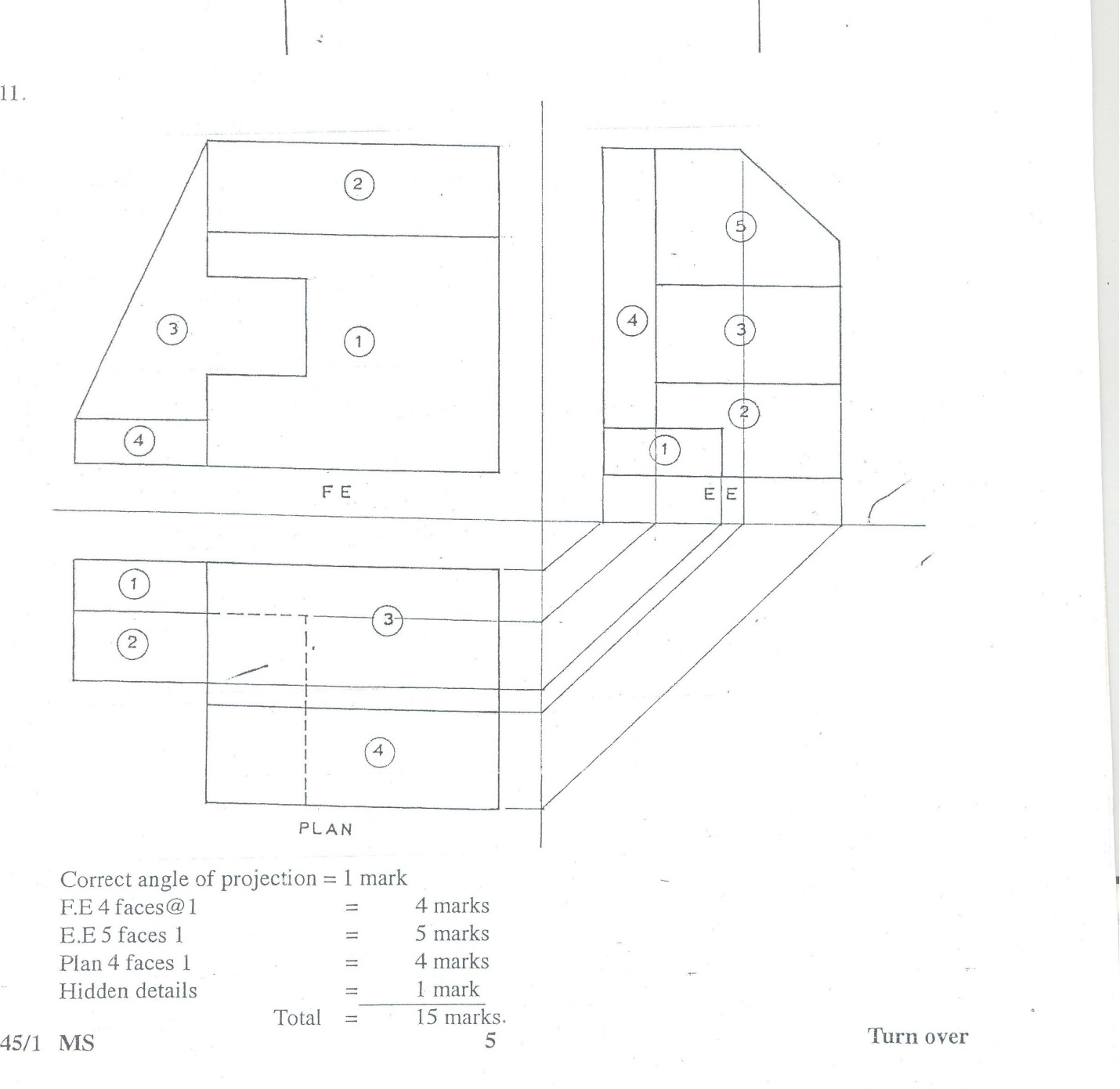
10.



**SECTION B (60 MARKS)**

*Answer* ***question*** *11 on the A3 paper provided and any other THREE questions from this section in the spaces provided. Candidates are advised to spend* ***not mope more than*** *25 minutes on question 11.*

11.



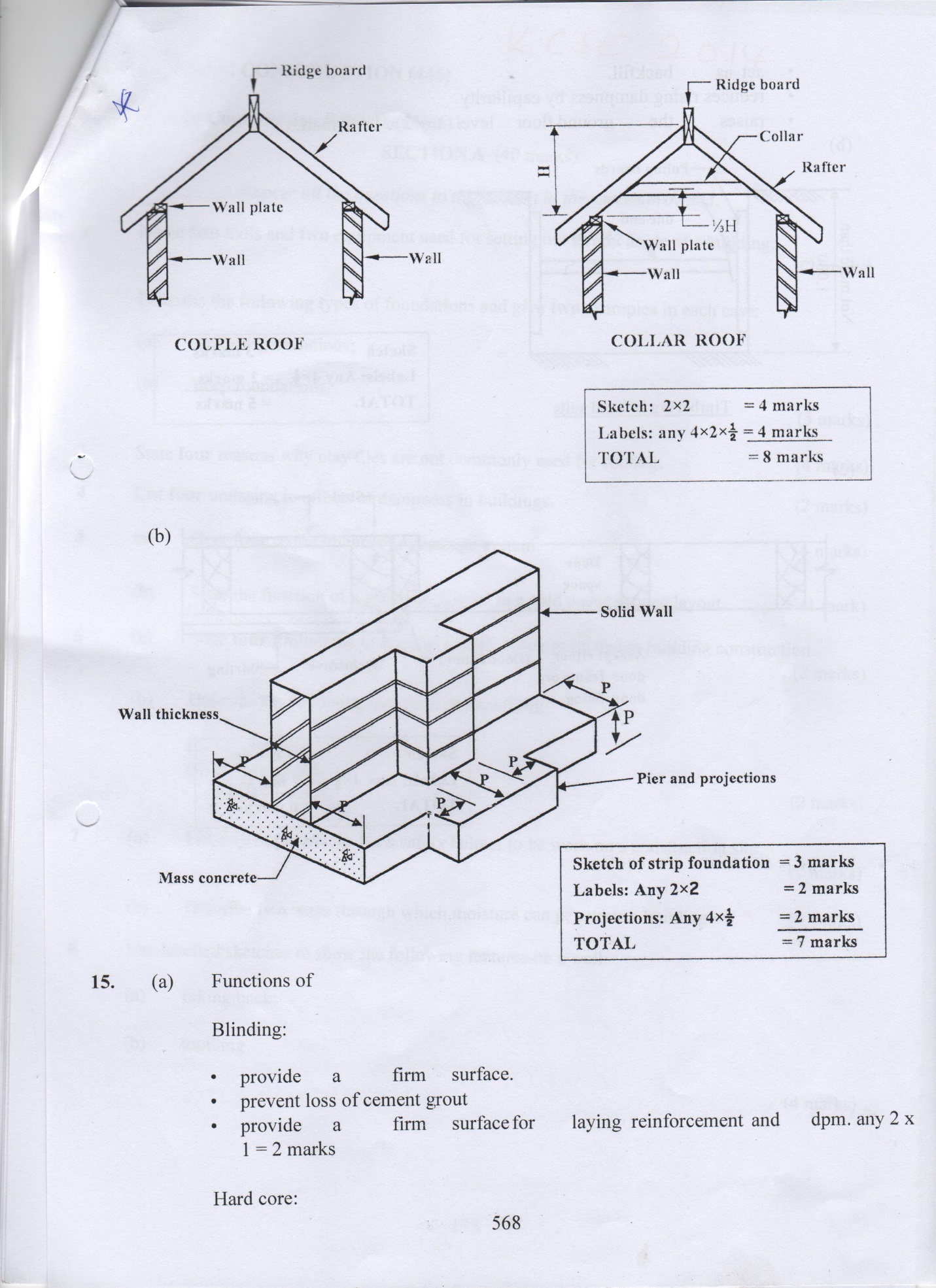
1. (a) Give two advantages of twisted reinforcement bars over the round reinforcement bars when used in concrete.

-twisted bars provides better grip due to increased surface area and also increases friction.

-has higher strength.

(Any 2x1 =2 marks)

(b) Use labeled sketches to show the difference between a couple roof and a collar roof.



(c) State four methods of dropping concrete safely into a trench bottom more than 1.5 metres deep.

-chutes

-Hoist

-Convey belt

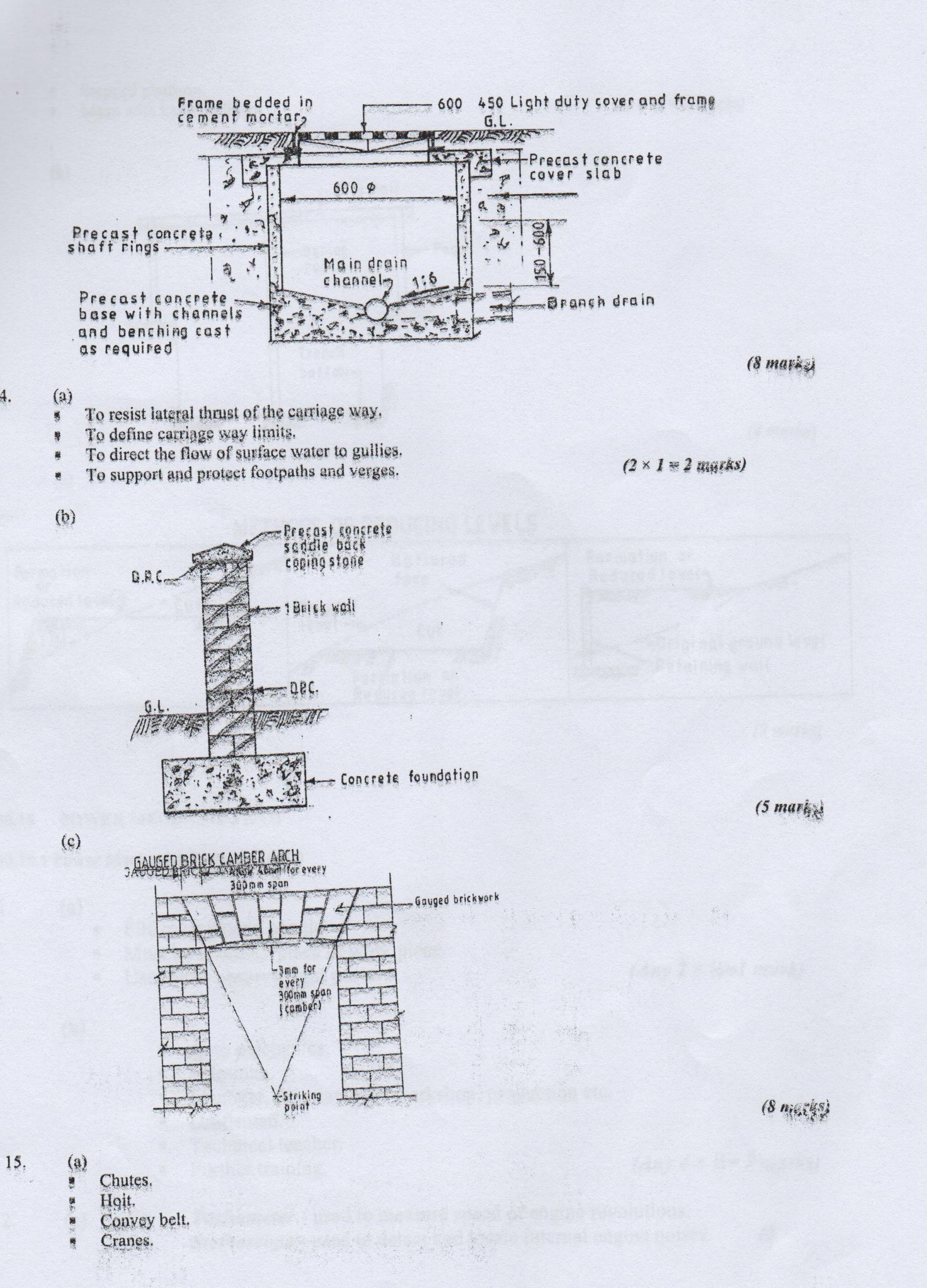
-cranes

-stepped platform

-men with karai on linen.

(Any 4x1 =4 marks

13. (a) Sketch and label an elevation of a gauged brick camber arch for a door opening.



(7 marks)

(b) State four functions of foundations in buildings.

-Provides a level base for walls.

-Transfer the loads to a firm base.

- Cover soft area in the firm base.

-Support the building.

-Load distribution over a wide area.

(Any 4x1 =4 marks)

(c) Illustrate the stages through which a standard eight leaver may undergo training up to the highest level in technical education.

-Primary level (KCPE)

-Youth polytechnic (Artisan certificate)

-Middle colleges- Craft certificate

- National polytechnic – Dip/ HND

-University (Degree / Masters / PHD

(Correct explanation 4 marks)

14. (a) Outline two reasons why concrete mixer needs a little amount of water before it’s operated?

- For easing the mix to turn properly & obtain a well prepared concrete mix.

-For safe guarding the mixture not to wear & tear easily & normally.

-To prevent sand & cement sticking on the side of the mixture.

(Any 2x1 =2 marks)

(b) Give four functional requirements of centres for arches.

- Be of sufficient strength and temporarily support the load to be imposed without distortion

-Be economical (not costly)

-Be easy to assemble and strike

- Incorporate folding wedges to allow vertical adjustment.

(Any 4x1 =4 marks)

(c) Give four precautions to take when you store cement in site.

-Check the date of manufacture.

- Store it off the ground.

-Protect it from the rain.

- Limit the height of the stacks.

- Use older cement.

(Any 4x1 =4 marks)

(d) State five functional requirements of a solid floor.

-It should prevent the passage of moisture from the ground to the upper surface of the floor

-It should be strong to carry its load and any load imposed on it.

-It should be good thermal insulator

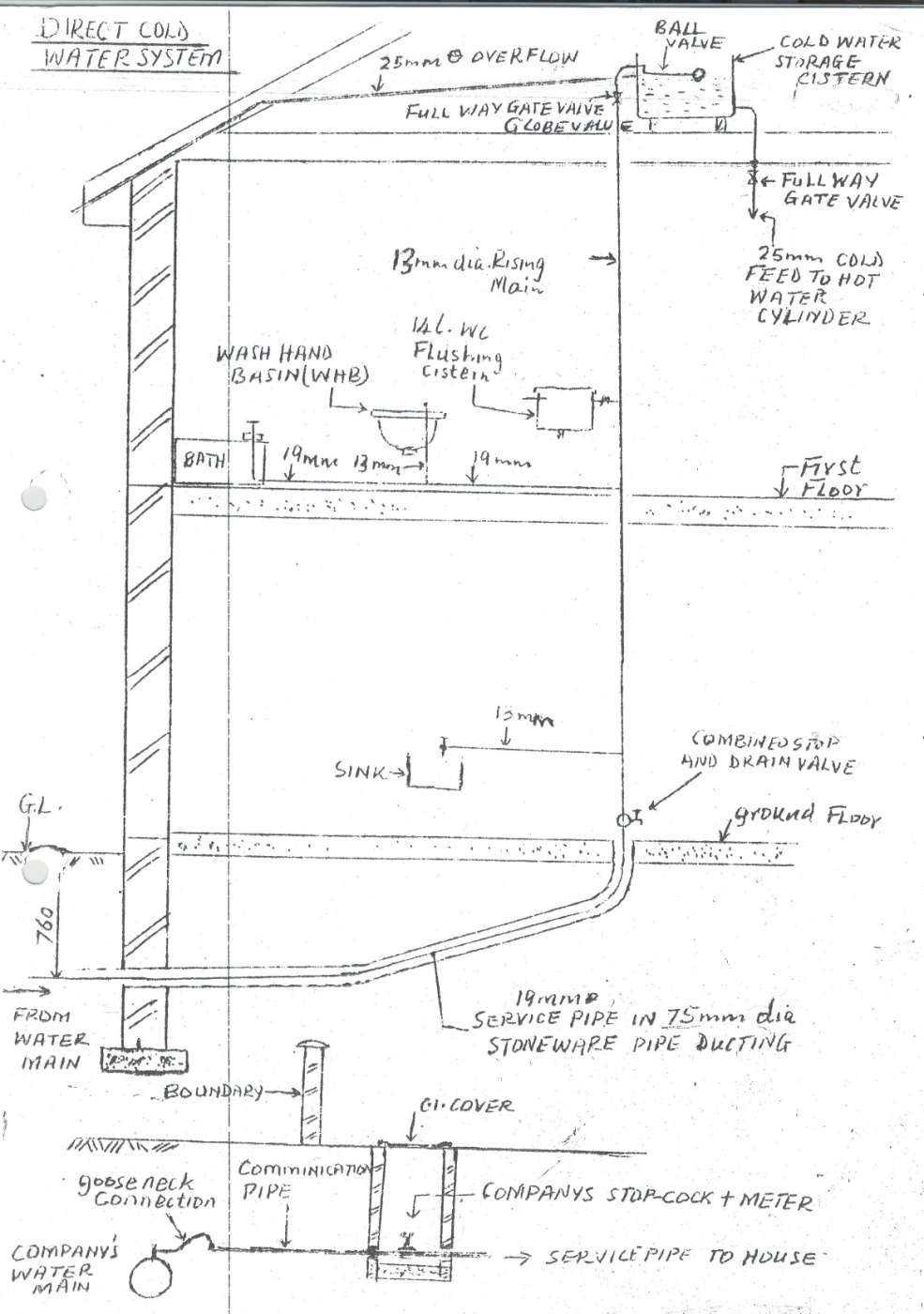
-It should be smooth (even) without cracks

-Should not allow fungal growth to take place

-To provide a suitable wearing surface

(Any 5x1 =5 marks

15. Illustrate using a neat sketch the direct cold water supply system. Label all the parts.



Sketch=6 marks

Any 5 appliances 5x1=5marks

Any 4 pipe sizes 4x ½ = 2marks

Any 4 valves 4x ½ =2 marks

Total =15 marks