

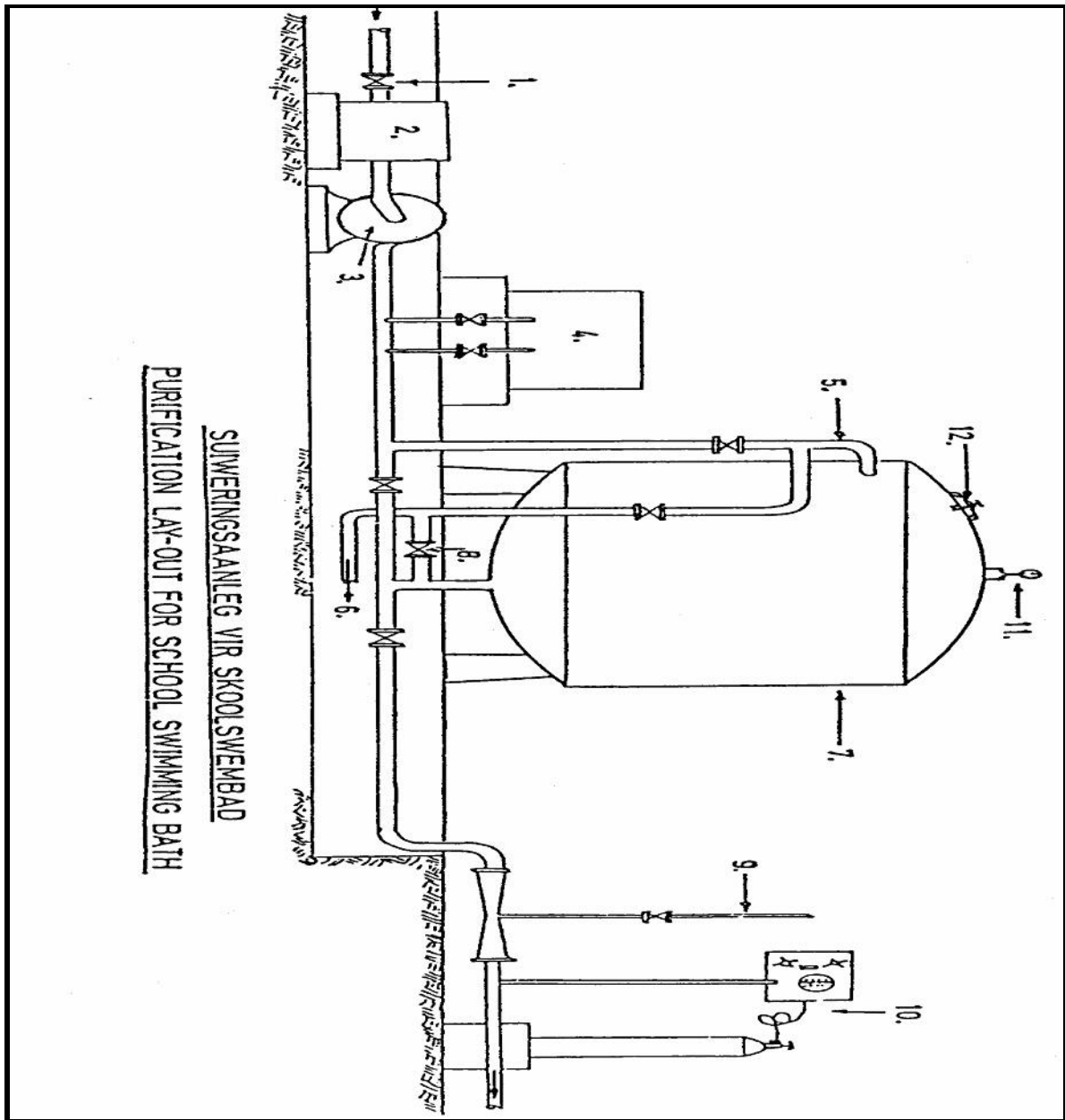
GAUTENG DEPARTMENT OF EDUCATION

SENIOR CERTIFICATE EXAMINATION

PLUMBING AND SHEET METALWORK SG

POSSIBLE ANSWERS OCT / NOV 2006

QUESTION 1  
WATER PURIFICATION



[15]

1.2

- Inlet valve
- Sieve
- Centrifugal pump
- Coagulant dosing tank
- Inlet valve
- Outlet for backwash water
- Filter
- Draining valve
- Venturi-air inlet
- Chlorinating apparatus
- Pressure valve
- Inspection hole

(10)

[25]

## QUESTION 2 DRAINAGE

2.1

- Sewerage should be laid according to the approved plan.
- The sewerage system should be laid in a straight line, on a reliable level.
- The sewerage should be laid to the approved slope.
- The sewerage should be laid on solid ground.
- The minimum sewerage depth of 600 mm should not be exceeded.
- The necessary provision should be made to make the system accessible.
- The necessary concrete reinforcement is provided according to regulation.

Any 6–2 marks each (12)

2.2

- Clay
- Cast iron
- P.V.C.

(3)

2.3

- The exit should protrude 100 mm above the eaves
- Where the vent pipe does not penetrate the eaves, the top section should be correctly anchored.
- The pipe opening should be provided with a grid.
- The exit should protrude at least 2 metres above any door, window or any ventilation hole, in the same building.
- The exit should be at least 6 metres away from the ventilation opening.
- At all outbuildings, the exit should be at least 2,5 metres above floor level.

(6)

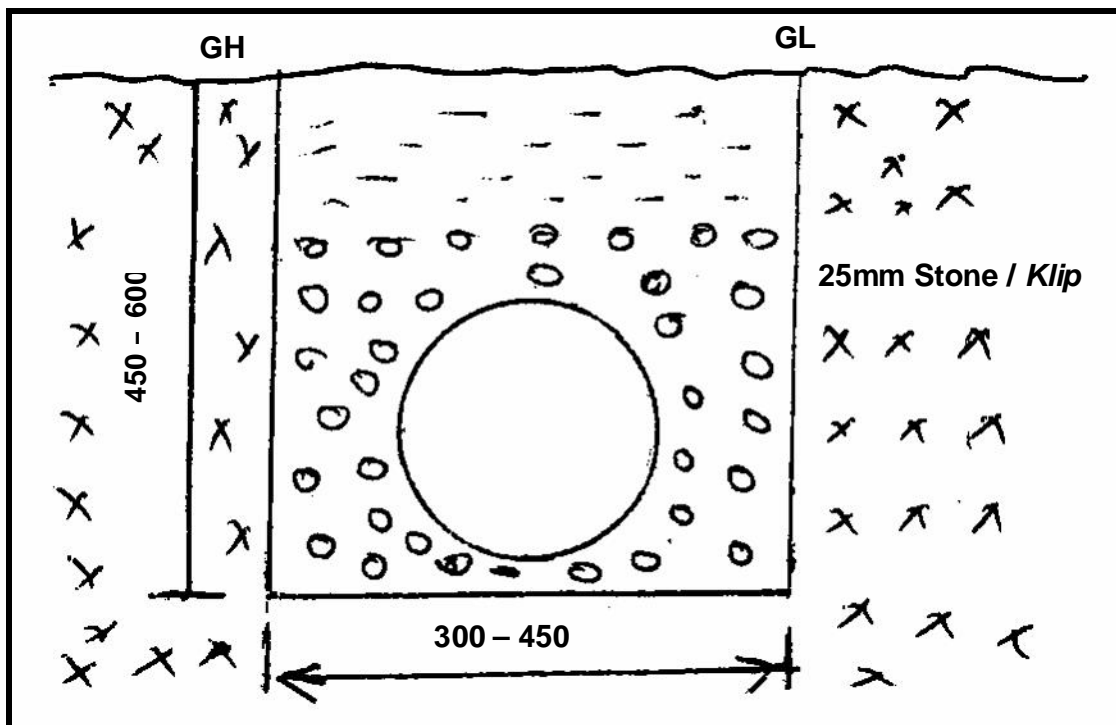
2.4    2.4.1    Soil vent pipe.                    S. V. P

- 2.4.2 Cast iron CI
- 2.4.3 Inspection eye IE
- 2.4.4 Water closet WC

(4)  
[25]

**QUESTION 3  
DRAINAGE**

- 3.1 Storage tank with centrifugal pump Sewerage water diverter (2)
- 3.2 New drains: Brown (2)  
Existing drains: Black (2)
- 3.3 A labelled sectional drawing of a sub-soil drain.



Proportion - 2  
Design - 2  
Measurements - 2  
6 (6)

- 3.4
- Open the inspection eyes to find the position of the blocked section.
  - Make use of cleaning rods.
  - Push the cleaning rod into the inspection eye opening nearest to the blockage.
  - Push the rod in and out until you can feel the drain is unblocked.
  - Close the inspection eye. (5)

- 3.5
- Check the cold water pipe system in the roof, to see if there are any pipes not properly fixed.
  - Make use of pipe clamps and repair all the loose cold water pipes
  - Test the system by opening the cold water tap, to make sure the problem is solved. (6)

- 3.6
- The water will flow too rapidly, leaving some of the heavier solids behind. (2)
  - This can block the drain. [25]

#### QUESTION 4 TESTING OF DRAINS

- 4.1
- Lengthy drainage systems cannot be tested as a whole. Each system must be tested separately.
  - The lower portion and all other openings must be sealed off by means of expanding plugs.
  - A hose pipe is used to fill the drain with water.
  - The above opening is sealed by means of an expanding plug to which a 12 mm pipe is attached, which protrudes 600 mm above the drain. A funnel is attached to the upper section of the pipe.
  - The drain is filled with water to the section of the funnel.
  - The water level should remain constant. Should the water continually drop, it indicates a leakage in the system, which can easily be detected by looking for leakages. (12)

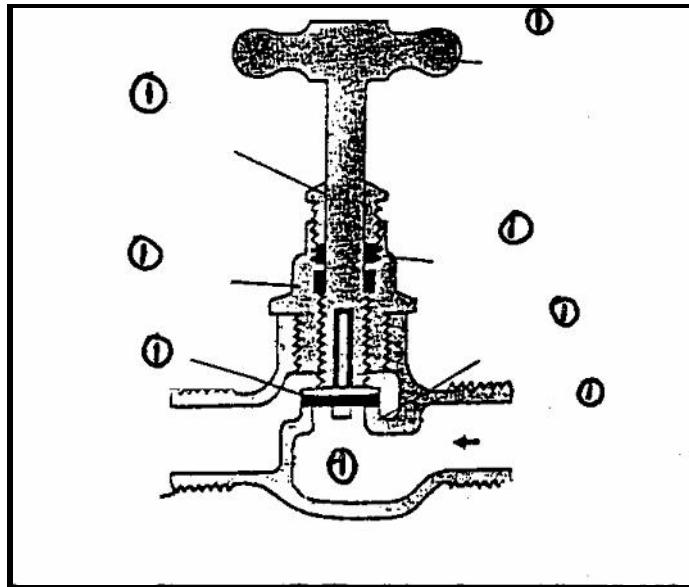
- 4.2 The air pressure test, where the drain is filled with air to a pressure of 200 Pa. (2)

- 4.3
- The drain is cleanly flushed.
  - The leakage can easily be identified by inspection of the pipe.
  - It is cheap. (3)

- 4.4
- Sub-soil drainage is used to dispose of undesired water.
  - Where the ground is water-logged, or the underground water is high
  - Perforated pipes are used to intercept the undesired water and to carry it to the gully,
  - from where it is pumped to a suitable storm water drain. (8)
- [25]

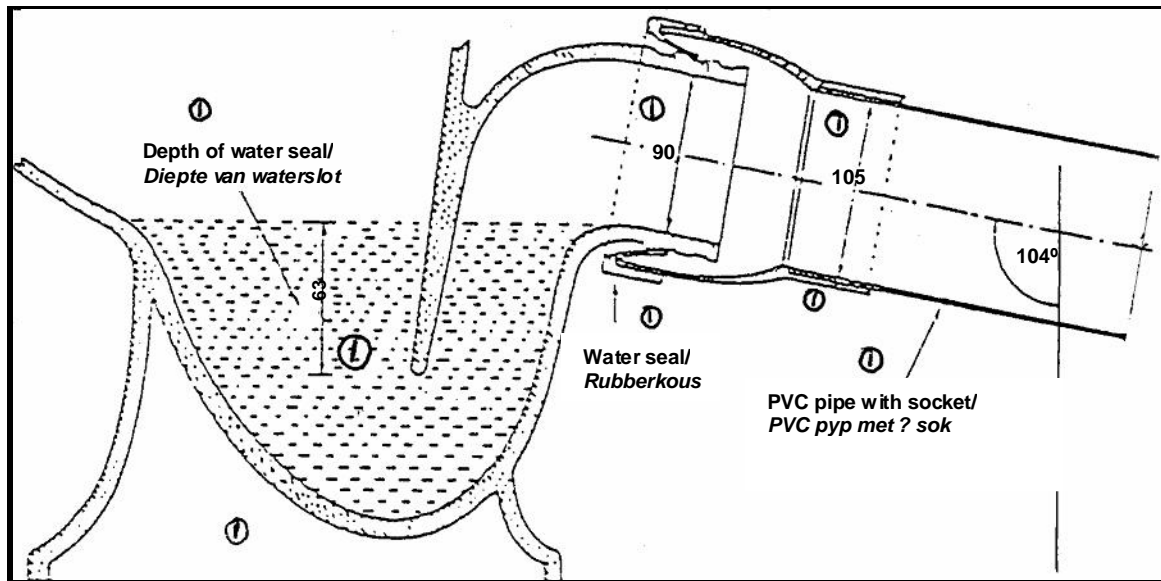
### QUESTION 5 SANITARY FITMENTS

- 5.1
- Manually controlled
  - Electronically controlled
  - Pressure controlled
- (3)
- 5.2
- Men's cloakrooms
  - Public buildings
- (2)
- 5.3 Draw a labelled sectional sketch of a stopcock. The drawing must show all the components of the stopcock. (8)



- 5.4 By setting the tap slower or faster, the intervals are lengthened or shortened. (4)

5.5

(8)  
[25]

### QUESTION 6 CENTRAL HEATING

6.1

- One pipe system
- Two pipe system

(2)

6.2.1 booster pump – speeds up the circulation of water in the system.

6.2.2 flow pipe – conveys the warm water from the boiler to the heater.

6.2.3 return pipe – water that has cooled down is conveyed in return pipes to the boiler to be re-heated. (2)

(2)

(2)

6.2.4 expansion tank – it allows for the expansion of water when it is heated. (2)

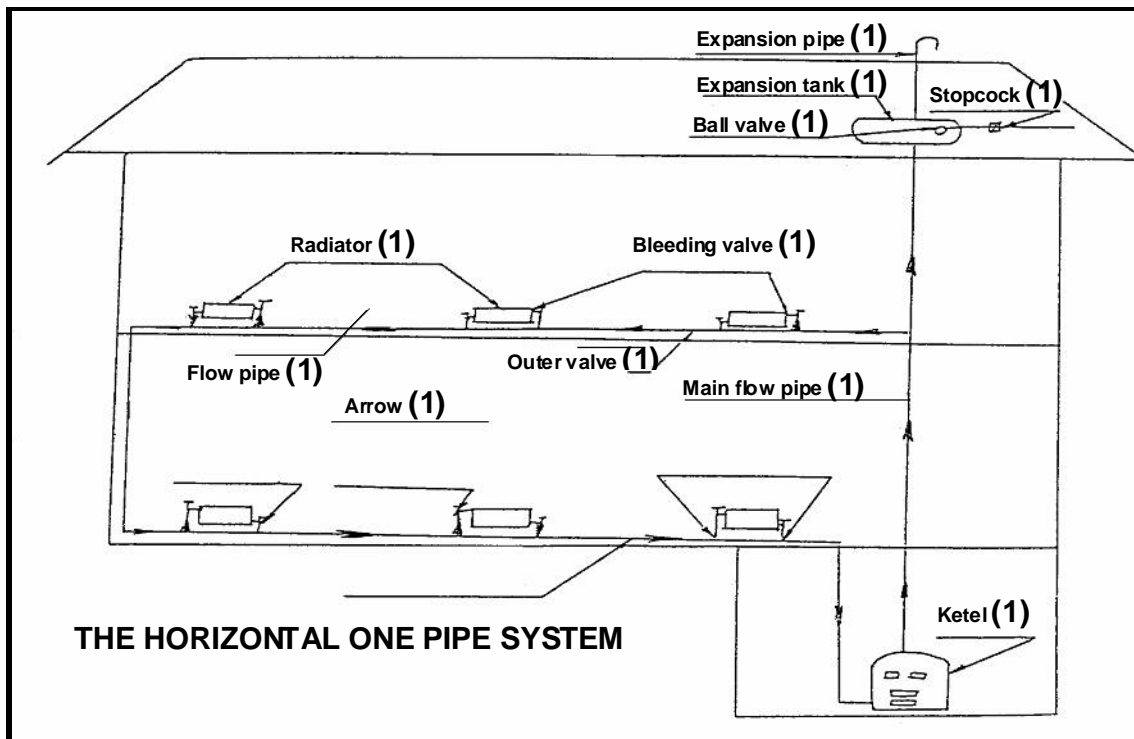
(2)

6.3

- A higher temperature is maintained throughout.
- A uniform temperature is maintained by various heaters.

(2)

6.4

(13)  
[25]

### QUESTION 7 VENTILATION AND CENTRAL AIR-CONDITIONING

7.1

- Oxygen
- Carbonic acid
- Nitrogen

(3)

7.2 0,12%

(1)

7.3

**Advantages** of natural ventilation:

- It is a simple method.
- It is inexpensive.

**Disadvantages** of natural ventilation:

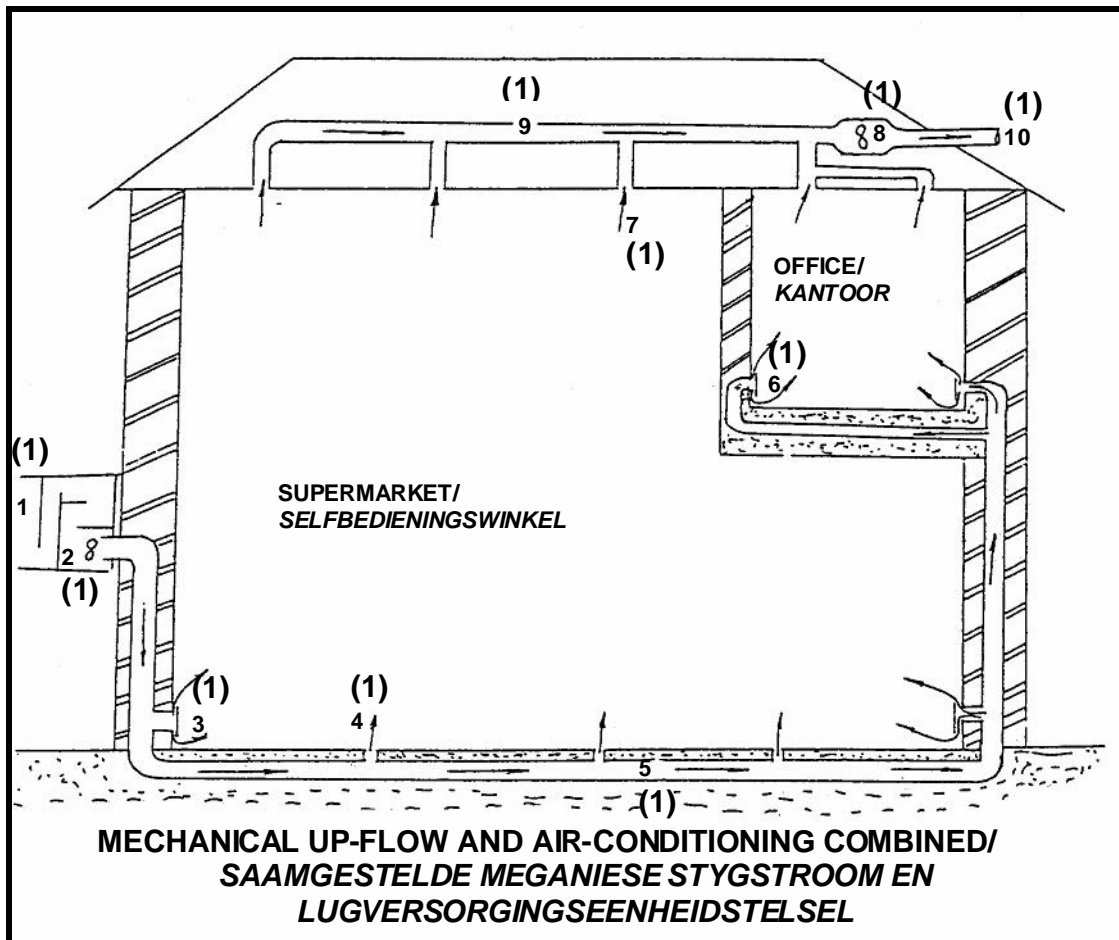
- It can only be applied successfully in houses, hospitals and schools.
- It is impossible to control and regulate the supply of fresh air effectively under changing weather conditions.
- "Fresh air" is not always completely pure, because it is subjected to the prevailing local conditions.

(10)

7.4 4% carbon dioxide will be fatal.

(1)

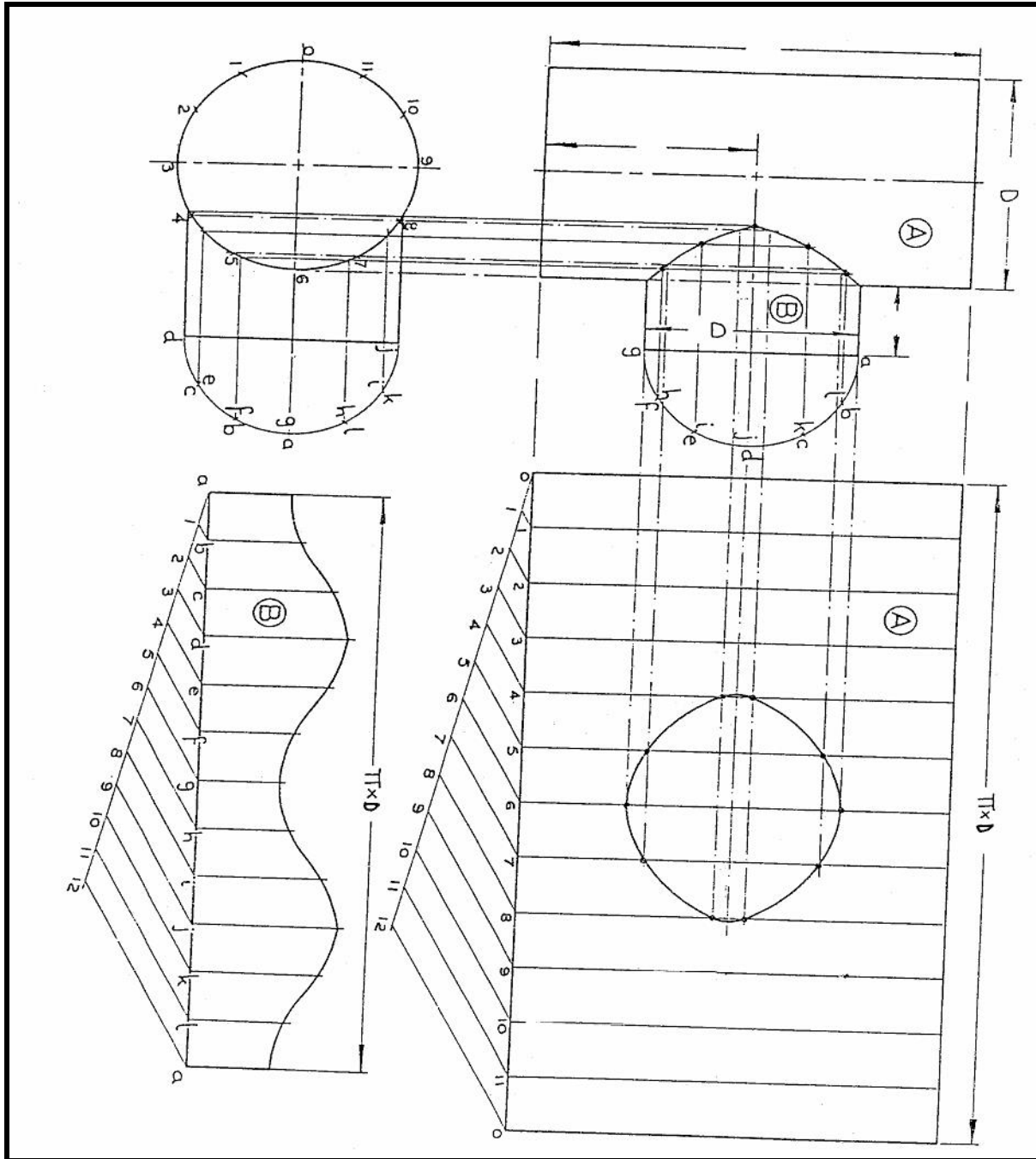
7.5



(10)  
[25]



QUESTION / VRAAG 8  
 PATTERN DEVELOPMENT / PATROONONTWIKKELING



Front View / Vooraansig	4
Plan / Plan	4
Developing / Ontvouing	12
Measurements / Afmetings	3
Line work / Lynwerk	2
<b>[25]</b>	
<b>200</b>	