



Test Canvas

Add, modify, and remove questions. Select a question type from the Add Question drop-down list and click **Go** to add questions. Use Creation Settings to establish which default options, such as feedback and images, are available for question creation.

Add [Creation Settings](#)

Name Filtration
Description questions concerning filtration
Instructions

[◀ Add Question Here](#)

10 points

Question What is the order of the back wash frequency?

Answer ✓

- Hours
- Days
- Months

Years

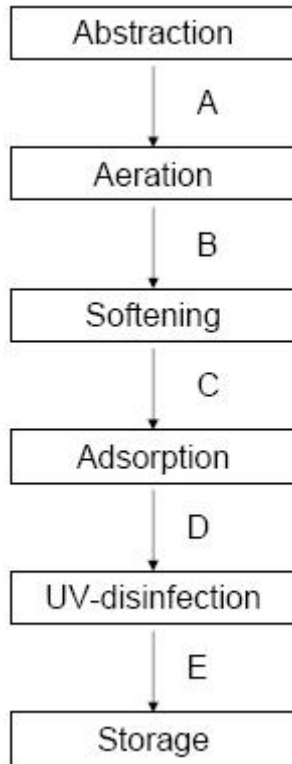
Correct Feedback See section 3.1

Incorrect Feedback See section 3.1

[◀ Add Question Here](#)

10 points

Question In the figure is a scheme shown of a ground water treatment plant. Where is filtration placed?
 More answer could be right.



Answer

- A
- ✓ B
- ✓ C
- D
- E

Correct Feedback
Incorrect Feedback

See section 1.1
See section 1.1

[◀ Add Question Here](#)

Question 3 ▾

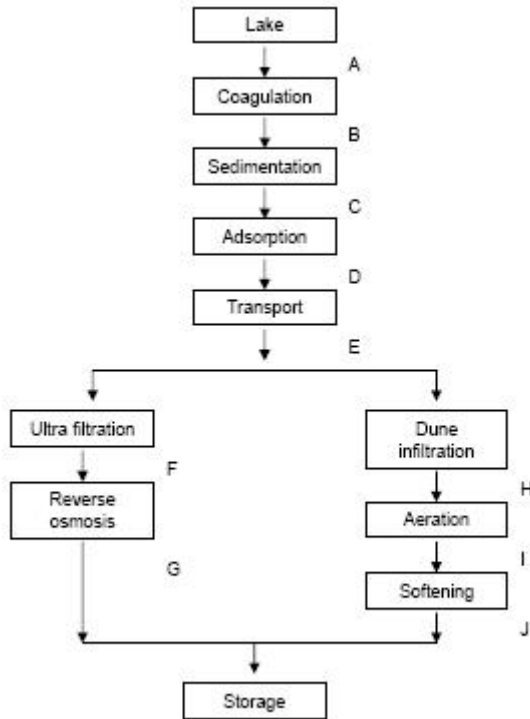
Multiple Answer

10 points

Modify

Remove

Question In the figure a scheme is shown of a ground water treatment plant. Where is filtration placed?
More answerd could be right.



Answer

- A
- B
- ✓ C
- D
- E
- F
- G
- H
- ✓ I
- ✓ J

Correct Feedback
Incorrect Feedback

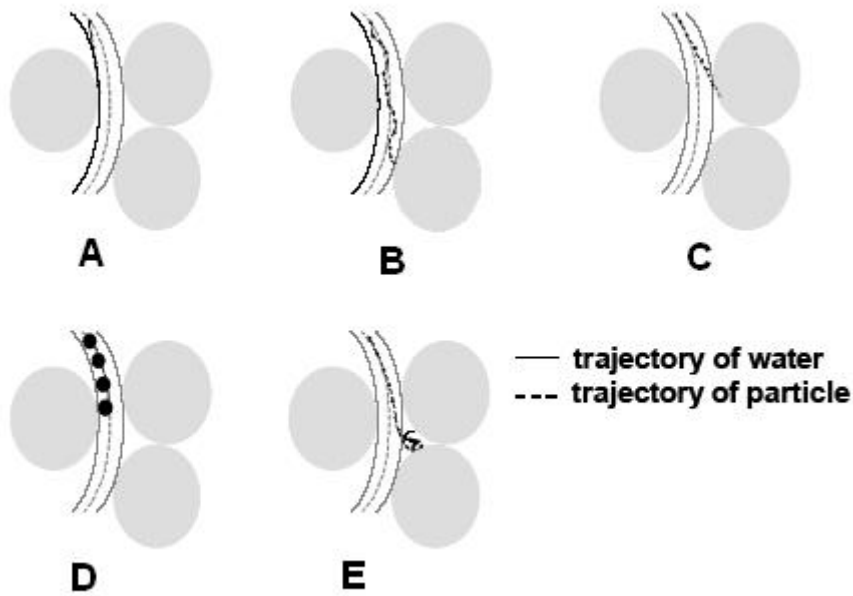
See section 1.1
 See section 1.1

[◀ Add Question Here](#)

Question 4 **Matching**

10 points

Question In the figure is given the transport of impurities towards the grain. Which of the processes belongs to the figures?



Answer

Match Question Items Answer Items

D. - A. Inertia A.

A. - B. Sedimentation B.

E. - C. Turbulence C.

C. - D. Diffusion D.

B. - E. Interception E.

Correct Feedback

See page 3.

Incorrect Feedback

See page 3.

[◀ Add Question Here](#)

Question 5

Multiple Choice

10 points

Modify

Remove

Question What is the filtration velocity?

Answer

less than 5 m/h



between 5 and 20 m/h

between 20 and 40 m/h

more than 40 m/h

Correct Feedback See section 3.1

Incorrect Feedback See section 3.1

[◀ Add Question Here](#)

Question 6

Matching

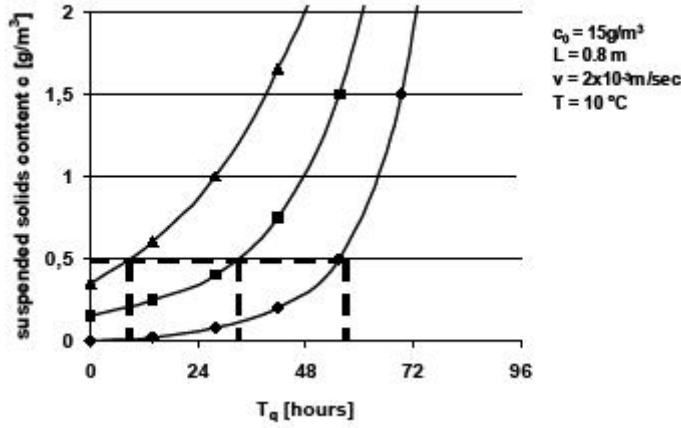
10 points

Modify

Remove

Question

In the figure you find results of different filter runs to obtain an optimally functioning filter. Which diameter of the filter material belongs to which line?



Answer

Match Question Items Answer Items

C. - A. d = 0.7 mm A.



B. - B. d = 0.8 mm B.



A. - C. d = 0.9 mm C.



Correct Feedback

See figure 3.5

Incorrect Feedback

See figure 3.5

[◀ Add Question Here](#)

Question 7 ▾

Matching

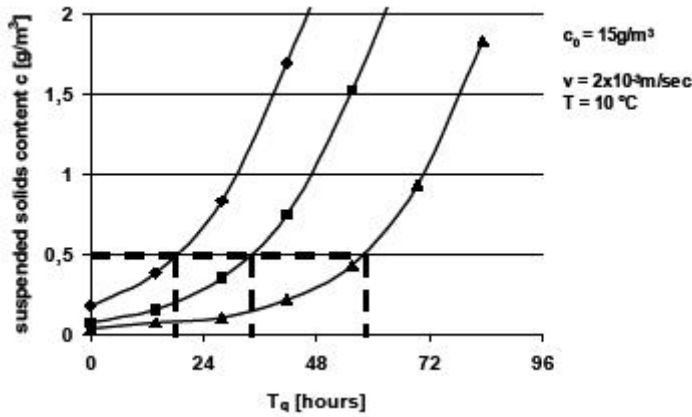
10 points

Modify

Remove

Question

In the figure you find results of different filter runs to obtain an optimally functioning filter. Which length of the filter belongs to which line?



Answer

Match Question Items Answer Items

C. - A. L = 1.0 m A.



B. - B. L = 1.2 m B.



A. - C. L = 1.5 m C.



Correct Feedback

See figure 3.5.

Incorrect Feedback

See figure 3.5.

[◀ Add Question Here](#)

Question 8

Multiple Choice

10 points

[Modify](#)

[Remove](#)

Question What is the most common filter material?

Answer

- clay
- Dune sand
- ✓ River sand
- gravel

[◀ Add Question Here](#)

Question 9

Multiple Choice

10 points

[Modify](#)

[Remove](#)

Question When is dry filtration used?

Answer

- When the water has a high iron concentration.
- When the water has a high manganese concentration.
- When the water has a high hardness.
- ✓ When the water has a high ammonia concentration.

Correct Feedback See section 3.3.5

Incorrect Feedback See section 3.3.5

[◀ Add Question Here](#)

Question 10

True/False

10 points

[Modify](#)

[Remove](#)

Question It is possible to remove bacteria and viruses with a filter.

Answer

- ✓ True

False

Correct Feedback A slow sand filter can be used, see Section 3.3.6

Incorrect Feedback A slow sand filter can be used, see Section 3.3.6

[◀ Add Question Here](#)

Question 11

True/False

10 points

Modify

Remove

Question Slow sand filters need to be backwashed every couple of days.

Answer True
 False

Correct Feedback Filtration occurs mainly in the top layer of a slow sand filtration, where a biological active "Schmutzdecke" is formed. To clean the filter the upper sand layer (usually 1 cm) is scraped. The run time of a slow sand filter is of a order of magnitude of several years. See section 3.3.6.

Incorrect Feedback Filtration occurs mainly in the top layer of a slow sand filtration, where a biological active "Schmutzdecke" is formed. To clean the filter the upper sand layer (usually 1 cm) is scraped. The run time of a slow sand filter is of a order of magnitude of several years. See section 3.3.6.

[◀ Add Question Here](#)

Question 12

Multiple Choice

10 points

Modify

Remove

Question

After a cascade aeration a wet filtration step is installed for groundwater treatment.

Flow: 2000 m³/h; Total surface area: 200 m²; Filterbed height: 1.5 m; Supernatant water height: 1 m; Filterbed grain size: 1 mm; Temperature: 20°C; Initial porosity: 0.4;

Answer 0.16 m
 0.29 m
 0.44 m
 0.86 m

Correct Feedback

$$H = 180 \frac{v (1-p)^2}{g p^3} \frac{v}{d^2} L = 180 \frac{10^{-6} \cdot 0.6^2}{9.81 \cdot 0.4^3} \frac{10}{3600 \cdot (10^{-3})^2} \cdot 1.5 = 0.44 \text{ m}$$

Incorrect Feedback

$$H = 180 \frac{v (1-p)^2}{g p^3} \frac{v}{d^2} L = 180 \frac{10^{-6} \cdot 0.6^2}{9.81 \cdot 0.4^3} \frac{10}{3600 \cdot (10^{-3})^2} \cdot 1.5 = 0.44 \text{ m}$$

[◀ Add Question Here](#)

Question 13

Ordering

10 points

Modify

Remove

Question

The effluent quality should be improved. The suspended solid concentration in the effluent is too high. The operator suggest 4 alternatives to improve the situation:

A: increase the bed height; B:change the sand with a finer sand fraction; C: lower the surface load; D: decrease Tr.

Order these alternatives in cost from high to low.

Answer	Display Order	Correct Order
	1.	2.
	Decrease Tr.	Increase the bed height.
	2.	3.
	Increase the bed height.	Lower the surface load.
	3.	4.
	Lower the surface load.	Change the sand with a finer sand fraction.
	4.	1.
	Change the sand with a finer sand fraction.	Decrease Tr.

Correct Feedback Increase the bed height --> smaller Tr --> bigger Tq --> doorslag????? takes more time--> adapt the filter height. Costs--> high, if it is possible to adapt the filters.

Lower the surface load --> doorslag???? takes more time --> capacity decreases --> more filters have to be built.

Change the sand with a finer sand fraction --> smaller Tr --> bigger Tq--> quality will increase--> filter will clog faster --> more often backwash. Costs for replacing the sand are only once.

Decrease Tr --> no doorslag???? -->no costs.

Incorrect Feedback Increase the bed height --> smaller Tr --> bigger Tq --> doorslag????? takes more time--> adapt the filter height. Costs--> high, if it is possible to adapt the filters.

Lower the surface load --> doorslag???? takes more time --> capacity decreases --> more filters have to be built.

Change the sand with a finer sand fraction --> smaller Tr --> bigger Tq--> quality will increase--> filter will clog faster --> more often backwash. Costs for replacing the sand are only once.

Decrease Tr --> no doorslag???? -->no costs.

[◀ Add Question Here](#)

Question 14 ▾

True/False

10 points

Question

Multiple layer filtration consists of a filter bed with various layers with different grain sizes.

True or False:

In downward direction the grain size and the density of the material decreases.

Answer True
 False

Correct Feedback In downward direction the grain size decreases, and the density of the material increases. See section 3.3.1.

Incorrect Feedback In downward direction the grain size decreases, and the density of the material increases. See section 3.3.1.

[◀ Add Question Here](#)

Question 15

Ordering

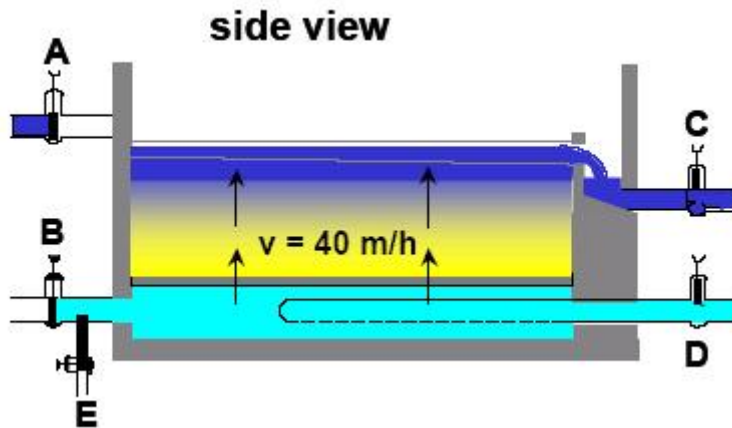
10 points

Modify

Remove

Question

What is the order of opening and closing valves for backwashing. Use the figure.



Answer

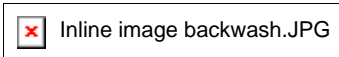
Display Order

- 1.
- Open valve A
- 2.
- Open valve B
3. Open valve C
4. Open valve D
- 5.
- Open valve E
6. Close valve A
7. Close valve B
- 8.
- Close valve C
9. Close valve D
- 10.
- Close valve E

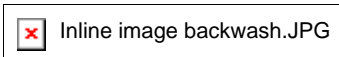
Correct Order

6. Close valve A
7. Close valve B
3. Open valve C
4. Open valve D
9. Close valve D
- 8.
- Close valve C
- 5.
- Open valve E
- 1.
- Open valve A
- 10.
- Close valve E
- 2.
- Open valve B

Correct Feedback



Incorrect Feedback



[◀ Add Question Here](#)

Question 16

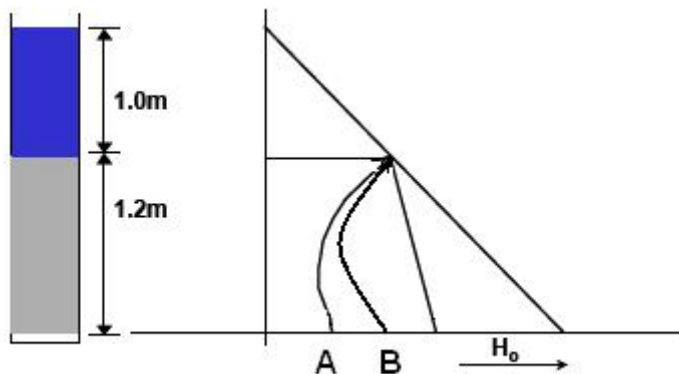
Multiple Choice

10 points

Modify

Remove

Question In the figure is the progress of the filter bed resistance in time, the so called Lindquist diagram shown for two times. Which of the lines, A or B, is the right line for the bed resistance at time 2?



Answer A
 B

Correct Feedback The largest resistance is build up in the upper layers of the filter bed, where most of the solids accumulate. In the lower layers the resistance gradient is almost equal to the clean bed gradient. This is shown by line A.

Incorrect Feedback The largest resistance is build up in the upper layers of the filter bed, where most of the solids accumulate. In the lower layers the resistance gradient is almost equal to the clean bed gradient. This is shown by line A.

[◀ Add Question Here](#)

Question 17 ▾

Multiple Choice

10 points

Question

The appleid bed expansion depends on the diameter of the filter material. When the filter material has a diameter of 0.8 mm an expansion of 15 to 20% is used, while a diameter of 1.2 mm requires an expansion of

more or less than 15 to 20%?

Answer more
 less

Correct Feedback 1.2 mm requires an expansion of 10%. See page 8.

Incorrect Feedback 1.2 mm requires an expansion of 10%. See page 8.

[◀ Add Question Here](#)

Question 18 ▾

Multiple Choice

10 points

Question Is there a difference between the surface area of a rapid filtration and slow sand filtration?

Answer No there is no difference in surface area.

Yes, there is a difference in surface area, rapid filtration needs more space than slow sand filtration.

Yes, there is a difference in surface area, slow sand filtration.needs more space than rapid filtration

Correct Feedback See figure 3.33.

Incorrect Feedback See figure 3.33.

[◀ Add Question Here](#)

OK