Unit 8 - week 6

Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-11, 23:59 IST.

1) Colloidal particles are difficult to remove through plain settling, because: 1 point

a) These settling velocities are too low to settle these in few hours
b) They can't interact and form agglomerate due to electrostatic repulsion among these particles
c) Both, a) and b) are correct
d) Neither a) nor b) is correct

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

2) Sweep floc formation is usually achieved when: 1 point

a) Coagulant doses are less and not enough to cause destabilization of colliders
b) Coagulant doses are just adequate to destabilize colliders
c) Coagulant doses are much more than what is needed for destabilization of colloids
d) Sweep floc formation does not depend on coagulant doses

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

3) Which of these cases are generally most challenging to ensure proper coagulation-flocculation? 1 point

a) High colloid concentration and high alkalinity
b) Low colloid concentration and high alkalinity
c) High Colloid concentration and low alkalinity
d) Low colloid concentration and low alkalinity

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

4) Which of these are used as coagulant aid? 1 point

a) Insoluble particulate materials such as clay and sodium silicate
b) Synthetic organic polymers such as polyelectrolytes
c) Starch and Starch derivatives
d) All of the above

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

5) Identify the correct pairs from the table below: 1 point

Basin Type	Velocity Gradient (G, s^{-1}	Residence Time (Minutes)
A. Rapid Mix	I. 300 - 1000	m) 10 - 40
B. Flocculator Basin	II. 20 -100	n) 0.3 -1

a) A-I-n, and B-II-m
b) A-I-m, and B-II-n
c) A-II-n, and B-I-m
d) A-II-m, and B-I-n

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

6) Clarriflocculator usually has following processes in a single unit: 1 point

a) Coagulation and flocculation
b) Flocculation and sedimentation
c) Coagulation and clarification
d) Coagulation flocculation and sedimentation

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

7) In a baffled channel, tapered flocculation may be achieved by: 1 point

a) Closer spacing of baffles in the beginning and wider spacing of baffles towards end of the channel
b) Wider spacing of baffles in the beginning and closer spacing of baffles towards end of the channel
c) Gradually decreasing the loading rates (discharge at the inlet) to the flocculator
d) Gradually increasing the loading rates (discharge at the inlet) to the flocculator

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

8) Slow Sand Filters are suitable for: 1 point

a) Large urban communities dependent on relatively less turbid water source
b) Large urban communities dependent on highly turbid water source
c) Rural communities dependent on highly turbid water source
d) Rural communities dependent on relatively less turbid water source

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

9) A good filter media should have 1 point

a) Very high uniformity coefficient
b) High uniformity coefficient
c) Low uniformity coefficient
d) Uniformity coefficient less than one

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

10) Which of these mechanisms is NOT a significant contributor for contaminant removal in Rapid Sand Filters? 1 point

a) Adsorption
b) Physical straining
c) Biological action
d) All of the above mechanisms are significant

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

11) Function of under drainage system in rapid sand filters include: 1 point

a) Collection of filtered water and collection of backwashed water
b) Collection of filtered water and flushing out dirty backwash water
c) Collection of filtered water and distribution of pumped-in backwash water
d) Supporting the filter media and collection of filtered water

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:

12) Pressure Filters are not used for large municipal supplies because: 1 point

a) Its treatment efficiency is always poor than Rapid Sand Filters
b) It has high energy cost and complicated maintenance procedure
c) It can't be operated at high flow rates which is required for large municipal supplies
d) All of the above

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

13) Amount of 10,000 mg/L $FeCl_3$ coagulant stock required to ensure 5 mg/L doses in a 2 L jar would be: 1 point

a) 1 mL
b) 1.5 mL
c) 2 mL
d) 4 mL

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

14) Water depth of a circular cross section Rapid Mix to be designed for 30 sec detention time and 1110 m^3/s flow should be: 1 point

a) 2 m
b) m
c) 3 m
d) 3.5 m

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:

15) If maximum surface per filter is limited to 50 m^2, minimum number of beds required in a rapid sand filter with loading rate of 4.5 m/h treating 12 MLD flow would be: 1 point

a) Three
b) Four
c) Five
d) Six

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

16) The total area required and recommended number of filter beds (as per MoUD Guidelines) needed for a slow sand filter to be designed for loading rate of 0.1 m/h to treating 450 MLD flow, would be: 1 point

a) Total required area 450 m^2 and minimum 4 filter beds
b) Total required area 450 m^2 and minimum 5 filter beds
c) Total required area 187.5 m^2 and minimum 2 filter beds
d) Total required area 187.5 m^2 and minimum 3 filter beds

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

17) Head loss in a 0.75 m deep sand bed having mean particle size of 0.7 mm, sphericity 0.82, and bed porosity as 0.45, with a filtration rate of 7.5 m/h, would be [Assume: k=5, and Kinematic viscosity = $1.131x10^{-6}$ m^2/s at 13°C] 1 point

a) 0.11 m
b) 0.22 m
c) 0.33 m
d) 0.44 m

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

Problem Statement (18-20): A filter unit of size 3 m wide, 8 m long, and 2.5 m deep is filtering 9500 m^3 water in 47 hrs 30 minutes, and is backwashed thereafter for 30 minutes at a rate of 0.5 m/min.

18) The average filtration rate (in m/h) for the filter is: 1 point

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 4,6

19) The average net daily outflow (m^3/d) from the filter is: 1 point

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 4000,5000

20) The wash-water flow rate (m^3/s) to each of the three troughs is: 1 point

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.06,0.14