

## Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

● Lecture 16 : Pumping Stations

● Lecture 17 : Pumps

● Lecture 18 : Sizing of Pumps

● Lecture 19 : Service Reservoir - Part I

● Lecture 20 : Service Reservoir - Part II

● Week 4 Lecture Material

 Quiz: Week 4 : Assignment 4

● Week 4 Feedback Form

Week 5

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Detail Solution

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## Week 4 : Assignment 4

The due date for submitting this assignment has passed.

**Due on 2021-09-01, 23:59 IST.**

As per our records you have not submitted this assignment.

 1) The different applications for pumps are: 1 point

- a. For lifting water (high quantity, low pressure) from a well, treatment plant
- b. For pumping water into the distribution system
- c. To boost pressure within the distribution system
- d. All of these

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

 2) \_\_\_\_\_ pump directly into the distribution system whereas \_\_\_\_\_ increase pressure and are located anywhere in the pipeline. 2 points

- a. High lift pumps, booster pumps
- b. Booster pumps, High lift pumps
- c. High lift pumps, Air lift pumps
- d. Air lift pumps, booster pumps

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

 3) Among the following statements, the correct statement(s) is/are: 1 point

- A. Rotary pumps are suitable for handling liquid containing suspended matter due to the close fitting on the rotor.
- B. In an impulse pump, a large amount of water at a moderate head is used to lift a small amount of water to a higher head.
- C. In a centrifugal pump, rate of flow can be regulated.
- a. B
  - b. A and B
  - c. C and A
  - d. A

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

 4) \_\_\_\_\_ is used when there is suspended matter, acid or alkali which may damage the pump. 1 point

- a. Displacement pump
- b. Air lift pump
- c. Impulse pump
- d. Centrifugal pump

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

 5) In the mass curve method, storage required is taken as the sum of the two \_\_\_\_\_ ordinates between demand and supply curves. 1 point

- a. maximum
- b. minimum
- c. average

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

 6) Among the following statements, the incorrect statement(s) is/are: 1 point

- A. Sluice or gate valves are used for isolating pumps in the discharge side
- B. In the discharge side, check, gate or butterfly valve are installed
- C. Pressure relief valves are used in the discharge side for flow control, pressure regulation, and to protect from surge pressures
- D. Air release and vacuum relief valves are used on suction side for vertical turbine pumps.
- a. B and C
  - b. A and D
  - c. A, C and D
  - d. B, C and D

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

 7) Match the following: 1 point

Term	Definition
P. Suction lift	I. Difference between point of discharge and the pump
Q. Discharge lift	II. Work done by a pump in raising the water.
R. Head loss	III. Difference between low water level and pump
S. Horsepower of a pump	IV. Frictional loss in pipe.

The correct match from the set of options given below is:

- a. P-III; Q-I; R-IV; S-II
- b. P-II; Q-I; R-III; S-IV
- c. P-IV; Q-III; R-I; S-II
- d. P-I; Q-IV; R-II; S-III

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

 8) From a clear water reservoir, 8 metre deep and maximum water level at 50 metres, water is to be pumped to an elevated reservoir at 100 metres at a constant rate of 5,00,000 litres/hour. Distance is 1000 metres. Calculate the brake horse power of the pump. Assume economic diameter of rising main,  $f=0.01$  and efficiency = 90%. 2 points

- a. 126.5 to 141.2 HP
- b. 152.5 to 174.5 HP
- c. 101.8 to 130.5 HP
- d. 139.4 to 158.2 HP

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

 9) Among the following statements, choose the incorrect statement/s regarding service reservoirs: 1 point

- A. Balances the fluctuating demand in the distribution system
- B. Provides appropriate pressure required in the distribution system
- C. Increases the pressure fluctuations.
- D. Allows the source to give output at a different rate or in a steady rate
- a. A only
  - b. A and B
  - c. B and D
  - d. C only

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

 10) Service reservoir capacity depends on: 1 point

- a. Reservoir capacity.
- b. Topography of the site
- c. Costs of materials: concrete, reinforcement, and formwork
- d. All of these

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

 11) Total storage capacity of a storage reservoir is the sum of: 1 point

- a. Balancing storage+ Breakdown storage
- b. Balancing storage + Fire storage
- c. Breakdown storage + Fire storage
- d. Balancing storage + Breakdown storage + Fire storage

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

 12) Economic depth for any service reservoir depends on its: 1 point

- a. break down storage
- b. total storage
- c. balancing storage
- d. none of these

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

 13) Choose the correct statement/s in regards to sewage pumping stations: 1 point

- A. It is provided within the sewerage network for lifting sewage to a shallow sewer.
- B. Used for conveying sewage to the STP or outfall
- C. To convey sewage from low lying areas to existing sewerage infrastructure
- a. A only
  - b. A and B
  - c. B and C
  - d. A, B and C

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

 14) Pumps sizes are determined based on 1 point

- a. Annual average daily consumption, annual maximum daily consumption, peak hour consumption on annual maximum day
- b. Annual average daily consumption and annual maximum daily consumption
- c. Discharge head and flow needed at the point of connection
- d. Annual average daily consumption, annual maximum daily consumption, peak hour consumption on annual maximum day, discharge head and flow needed at the point of connection

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

 15) Darcy-Weisbach formula for determining the head loss due to friction along a given length of pipe to the average velocity of the fluid (incompressible) flow is,  $H_f =$  1 point

- a.  $\frac{f \cdot L \cdot V^2}{4gd}$
- b.  $\frac{f \cdot L \cdot V^3}{2gd}$
- c.  $\frac{f \cdot 2L \cdot V^2}{3gd}$
- d.  $\frac{f \cdot L \cdot V^2}{2gd}$

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

 16) \_\_\_\_\_ reservoirs are most economical and used in case of large capacity whereas, \_\_\_\_\_ reservoirs are preferred for small capacity. 1 point

- a. Circular, rectangular
- b. Elliptical, hexagonal
- c. Circular, elliptical
- d. Rectangular, elliptical

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

 17) Calculate the storage required to supply the demand shown in the following table if the inflow of water to the reservoir is maintained at a uniform rate throughout 24 hours using the following data: 2 points

Time	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
Demand in million litres (Ml)	0.10	0.10	0.15	0.15	0.20	0.30	0.40	0.60	0.50	0.40	0.20	0.10
Time	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24
Demand in million litres (Ml)	0.20	0.25	0.20	0.50	0.45	0.35	0.30	0.10	0.10	0.10	0.10	0.10

- a. 1,250,000
- b. 1,500,000
- c. 850,000
- d. 600,000

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.