A Reg. No. : | | | | | | | | | | | | |

Question Paper Code:R3104

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Third Semester

Civil Engineering

R21UCE304 - WATER SUPPLY ENGINEERING

(Regulations R2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The future period for which a provision is made in the water supply scheme is known as the---------- CO1-U

   (a) Design period (b) Maximum Period (c) Per capita demand (d)Minimum Period

2. The maximum permissible pH for drinking water CO1 -U

   (a) 2.5-3.5 (b) 4.5-5.5 (c) 6.5-8.5 (d) 9.5-10.5

3. Most commonly used pump for lifting water in water supply mains, is CO2 -U

   (a) axial flow pump (b) reciprocating pump

   (c) rotary type pump (d) centrifugal pumps

4. For determining the velocity of flow of underground water, the most commonly used non-empirical formula is CO2 -U

   (a) Darcy's formula (b) Slichter's formula

   (c) Weisbach's formula (d) None of these

5. Removal of Living organisms including pathogens is done by _____ in water treatment. CO1 -U

   (a) Disinfection (b) Filtration (c) Coagulation (d) Softening

6. The period of cleaning of a slow sand filter, is usually CO1 -U

   (a) 5 to 10 days (b) two weeks to three weeks

   (c) one month to three months (d) one year

7. Most commonly used adsorbent is_____ CO1 -U

(a) Alum (b) Activated carbon (c) Resin (d) lime

8. Brackish Water refers to CO2 -U

(a) salt water (b) fluoride water (c) chloride water (d)sugar water

9. The storage capacity of a reservoir may be divided into three zones. The lowest zone is CO2 -U

(a) Dead storage (b) Useful storage (c) Surcharge storage (d) None of these

10. Sluice Valve is also called as CO2 -U

(a) Gate Valve (b) Reflux Valve (c) Scour Valve (d) Air Valve

PART – B (5 x 2= 10 Marks)

11. What are the components of water supply system? CO1 -U

12. If the annual average hourly demand of the city is 1500 m^3/h, what is the maximum hourly consumption (assume daily peak factor as 1.8 and hourly peak factor as 1.5) CO3-App

13. Estimate the capacity of tank for coagulation cum sedimentation tank with a discharge of flow is 20MLD and the detention period is 5 hours. CO3 -App

14. What are the methods of removing permanent hardness? CO1 -U

15. How do you identify the leakage in pipelines? CO2 -U

PART – C (5 x 16= 80 Marks)

16. (a) The population of a town as per past census records are furnished below. Predict the population in the year 2031 and 2041 using the following methods: CO6 App (16)

i. Arithmetical increase method
ii. Geometrical increase method
iii.Incremental increase method

year	1941	1951	1961	1971	1981	1991	2001	2011
Pop	44642	50487	56816	63859	71458	78543	88131	100290

Or

(b) The populations of 4 decades from 1940 to 1970 are given. Find out the Population for 1980, 1990 and 2000 using (i) arithmetic increase method (ii) incremental increase method (iii) Geometric increase method (iv) Decrease growth rate method. CO6 App (16)

Year	1940	1950	1960	1970
Population	8000	12,000	17,000	22,500

17. (a) Analyze the merits and demerits of Cast-Iron Pipes, Concrete Pipes, AC pipes and Plastic Pipes. CO3 Ana (16)

Or

(b) Analyze the good practices of Laying and Testing of Pipes in Water Supply system. CO3 Ana (16)

18. (a) Two million liters of water per day is passing through a sedimentation tank which is 6m wide, 15m long and having a water depth of 3m. CO2 App (16)
a) Find the detention time for the tank
b) what is the average flow velocity through the tank
c) Compute the overflow rate

Or

(b) Design a slow sand filter for a town of 30000 population the average daily demand being 135LPCD. The maximum demand may be taken as 1.5 times the average. CO2 App (16)

19. (a) Explain the concept of magnetite Zeolite filters with special notes on exchange reactions. CO1 U (16)

Or

(b) Differentiate and suggest which method is suitable for domestic purpose. CO1 U (16)
(i) Membrane process
(ii) Deflouridisation

20. (a) Explain in detail about the Requirements and Components of Water Distribution with suitable case example. CO1 U (16)

Or

(b) State the functions of a service reservoir, and sketch the sectional elevation of the same, showing the various appurtenances. CO1 U (16)

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