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**GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022**  
**B. Tech Degree Examinations, June – 2021**  
**(Sixth Semester)**  
**BCEPE6040 – WATER SUPPLY AND SANITARY ENGINEERING**  
**(Civil Engineering)**

Time: 2 hrs

Maximum: 50 Marks

**Answer ALL Questions****The figures in the right hand margin indicate marks.****PART – A: (Multiple Choice Questions)****(1 x 10 = 10 Marks)**Q.1. Answer ALL questions

[CO#] [PO#]

- |   |   |   |
|---|---|---|
| <p>a. The pH value of water is kept slightly less than 7 so that hydrochloride ions may combine with ammonia ions to form</p> <p>(i) Mono-chloramine (NHCl)      (ii) Di-chloramine (NH<sub>2</sub>Cl)</p> <p>(iii) Nitrogen tri-chloramine (NCl<sub>3</sub>)      (iv) All the above</p> | 1 | 1 |
| <p>b. Recuperation test is carried out to determine</p> <p>(i) Turbidity of water      (ii) pH value of water</p> <p>(iii) Yield of well      (iv) Discharge from a well</p>  | 1 | 1 |
| <p>c. A centrifugal pump is required to be primed before starting if it is located</p> <p>(i) At higher level than water level of reservoir      (ii) At lower level than water level of reservoir</p> <p>(iii) Both (a) and (b)      (iv) Neither (a) nor (b)</p>                        | 1 | 1 |
| <p>d. The rate of silting in a reservoir _____.</p> <p>(i) is less in the beginning      (ii) remains constant throughout</p> <p>(iii) is more in the beginning      (v) is more in the beginning and reduces in the end</p>  | 2 | 1 |
| <p>e. For determining the velocity of flow of underground water, the most commonly used non empirical formula is</p> <p>(i) Darcy's formula      (ii) Slichter's formula</p> <p>(iii) Hazen's formula      (iv) Lacy's formula</p>  | 2 | 1 |
| <p>f. Aeration of water is done to remove</p> <p>(i) Odour      (ii) Colour</p> <p>(iii) Bacterias      (iv) Turbidity</p>  | 2 | 1 |
| <p>g. The sewer pipes _____.</p> <p>(i) carry sewage as gravity conduits      (ii) are designed for generating self-cleansing velocities at different discharge</p> <p>(iii) should resist the wear and tear caused due to abrasion      (v) all the above</p>                            | 3 | 1 |
| <p>h. Cement concrete sewers are only suitable if non-scouring velocity is between _____.</p> <p>(i) 2.5 to 3.0 m/sec      (ii) 3.0 to 4.0 m/sec</p> <p>(iii) 3.5 to 4.5 m/sec      (iv) 4.5 to 5.5 m/sec</p>   | 3 | 1 |
| <p>i. For the COD test of sewage, organic matter is oxidized by K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> in the presence of</p> <p>(i) H<sub>2</sub>SO<sub>4</sub>      (ii) HNO<sub>3</sub></p>  | 4 | 1 |

- (iii) HCl (iv) none of these
- j. The amount of oxygen consumed by the aerobic bacterias which cause the aerobic biological decomposition of sewage, is known 4 1
- (i) bio-Chemical Oxygen Demand (B.O.D.) (ii) dissolved Oxygen (D.O.)
- (iii) chemical Oxygen Demand (C.O.D.) (iv) none of these

**PART – B: (Short Answer Questions)**

**(2 x 5 = 10 Marks)**

Q.2. Answer ALL questions

[CO# [PO#]

- |  |   |   |
|--|---|---|
| a. What are the factors governing the selection of a particular source of water? | 1 | 1 |
| b. What is turbidity?  | 1 | 1 |
| c. Define ion exchange.  | 2 | 1 |
| d. What is peak drainage disturbance?  | 3 | 1 |
| e. What are the factors affecting sludge digestion and their control?            | 4 | 1 |

**PART – C: (Long Answer Questions)**

**(6 x 5 = 30 Marks)**

Answer ANY FIVE questions

Marks [CO#] [PO#]

- |   |     |   |   |
|---|-----|---|---|
| 3. What are the different methods of forecasting water demand? Detail one of the method with examples.  | (6) | 1 | 1 |
| 4. Write location and working of following water supply system:<br>(i) Elbow<br>(ii) Plug<br>(iii) Sluice valve<br>(iv) Air release valve       | (6) | 1 | 1 |
| 5. What are the types of sedimentation tank and explain any one in detail.  | (6) | 2 | 1 |
| 6. Explain zeolite process of removing hardness.  | (6) | 2 | 1 |
| 7. Explain the methods available and limitations of land disposal of sewage.  | (6) | 3 | 1 |
| 8. Explain Primary, secondary and tertiary treatment of wastewater.   | (6) | 3 | 1 |
| 9. Briefly describe the configuration and operation of a biological rotatory contactor. In what way is it similar to a trickling filter system? | (6) | 4 | 1 |
| 10. Explain the different techniques for waste water reclamation.   | (6) | 4 | 1 |

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