**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, April 2023**

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|  | **3BT6108** | Roll No. | Total Printed Pages: 2 |
| **3BT6108** |  |
| B. Tech. III Year VI- Semester (Back) End Semester Examination, April 2023  **(CV)** | |
| **BCV06102 : Environmental Engineering-I** | | | |

# Max. Time: **3** Hours. Max. Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **1.----------------------------------------------** **2.-----------------------------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | Discuss different methods of population forecasting with their suitability. | **(6)** | **Analyze** |
|  |  |  |  |  |
|  | **(b)** | Write short notes on:  (1) Design Period (2) Role of an environmental Engineer | **(6)** | **Understanding** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.2** | **(a)** | What do you understand by environment? Classify its components and also explain importance of water with examples. | **(6)** | **Analyze** |
|  |  |  |  |  |
|  | **(b)** | The following data shows the variation in population of a town from 1941 to 1991. Estimate the population of the city in the year 2021, by using Geometrical increase method and Arithmetical increase method. |  |  |
|  |  | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Year | 1941 | 1951 | 1961 | 1971 | 1981 | 1991 | | Population | 72000 | 84000 | 110000 | 144000 | 180000 | 221000 | | **(6)** | **Evaluate** |
|  |  |  |  |  |
|  |  | **UNIT-II (CO2)** |  |  |
|  |  |  |  |  |
| **Q.3** | **(a)** | Draw a neat diagram of hydrological cycle and show all of its components. | **(6)** | **Apply** |
|  |  |  |  |  |
|  | **(b)** | Illustrate different classes of water as per its beneficial uses. | **(6)** | **Analyze** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.4** | **(a)** | Discuss different sources of water and suggest the criteria’s to select a particular water source for our water consumptions? | **(6)** | **Apply** |
|  |  |  |  |  |
|  | **(b)** | What are the different water quality parameters, discuss briefly. | **(6)** | **Understanding** |
|  |  |  |  |  |
|  |  | **UNIT-III (CO3)** |  |  |
|  |  |  |  |  |
| **Q.5** | **(a)** | What are the differences between line-soda process and zeolite process? Explain in detail with chemical reactions. | **(6)** | **Analyze** |
|  |  |  |  |  |
|  | **(b)** | Explain the factors affecting settling efficiency of a settling basin. | **(6)** | **Analyze** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.6** | **(a)** | What do you mean by cogulation in water treatment aspect? Explain its principle and also give any two examples of coagulants commonly used for this purpose and why? | **(6)** | **Understanding** |
|  |  |  |  |  |
|  | **(b)** | What are the criteria for the selection of pipe material for water supply scheme? | **(6)** | **Analyze** |
|  |  |  |  |  |
|  |  | **UNIT-IV (CO4)** |  |  |
|  |  |  |  |  |
| **Q.7** | **(a)** | A rapid sand filter of 35 MLD capacity is proposed for water supply treatment plant for a town. The rate of filtration is to be 100 litre/min/sq.m. Design:  (i) size and number of filter beds | **(6)** | **Evaluate** |
|  |  |  |  |  |
|  | **(b)** | Also design Manifold lateral underdrainage system for the data given in the above question. | **(6)** | **Evaluate** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.8** | **(a)** | Why disinfection of water is needed and explains the techniques used for this process. | **(6)** | **Analyze** |
|  |  |  |  |  |
|  | **(b)** | Compare the slow sand filters and rapid gravity filters. | **(6)** | **Analyze** |
|  |  |  |  |  |
|  |  | **UNIT V (CO5)** |  |  |
|  |  |  |  |  |
| **Q.9** | **(a)** | What are the requirements of a good water supply distribution system? Discuss different methods of distribution system. | **(6)** | **Understanding** |
|  |  |  |  |  |
|  | **(b)** | Classify different distribution reservoirs. Discuss the parameters on which design capacity of distribution reservoirs depends. | **(6)** | **Analyze** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.10** | **(a)** | Write short notes on:  (1) service connections (2) Distribution reservoirs | **(6)** | **Understanding** |
|  |  |  |  |  |
|  | **(b)** | Discuss different layouts of water supply distribution system. | **(6)** | **Apply** |