Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

**UNIVERSITY**



(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 2017**

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| **Code :** | **14CE2008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **WATER AND WASTEWATER ENGINEERING** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Forecast the population to 5 decades for a Coimbatore city using arithmetic increase method, incremental increase method and geometrical increase method. The population for the past 4 decades are: 28510; 52832; 89157; 1,26912 | CO2 | 15 |
| b. | Prepare a chart showing the permissible limits of any 10 chemical characteristics of water as per BIS drinking water standards. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Draw the layout of a water treatment unit, label and explain its different components. | CO3 | 16 |
|  | b. | Write down any four water pollution sources, and its health effect. | CO2 | 4 |
| 3. | a. | Classify the different types of solids in water. Summarize the methods of their determination. | CO1 | 5 |
|  | b. | Discuss the laboratory methods of estimation of chlorides, acidity, alkalinity and hardness. | CO1 | 15 |
| (OR) | | | | |
| 4. | a. | Define DO, BOD and COD. Mention the significance of these parameters. | CO1 | 4 |
|  | b. | A city with a population of 75,000 has to be supplied with water from an intake well from a river. The average per capita demand of the city is estimated to be 200 lpcd. A representative sample from the river was subjected to qualitative analysis and the concentration of settle able solids having an average specific gravity of 1.3 g/cc was found to be 70 % of the total solids. Decide the treatment unit required and hence design the unit for maximum daily demand. | CO3 | 16 |
| 5. | a. | Compare slow sand and rapid sand filter. | CO3 | 10 |
|  | b. | Discuss in detail about various types of chlorination. | CO3 | 10 |
| (OR) | | | | |
| 6. | a. | Describe the disinfection action of chlorine and its types. | CO3 | 12 |
|  | b. | Write a short note on intake structures and list the types of intake wells. | CO3 | 8 |
| 7. | a. | What are the different types of pipe joints used in water supply? Explain its merits and demerits. | CO3 | 16 |
|  | b. | List the various types of pipe materials and mention their application. | CO3 | 4 |
| (OR) | | | | |
| 8. | a. | Write a short note on Rotating Biological Contactor. | CO3 | 4 |
|  | b. | Demonstrate the step by step procedure of complex pipe network analysis using Hardy-Cross method. | CO3 | 16 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Draw and explain about the working principle of Trickling filter. | CO3 | 15 |
|  | b. | Write down about systems of distribution of water supply and their merits and demerits. | CO3 | 5 |