# B. E. CONSTRUCTION ENGINEERING 4TH YEAR 2ND SEMESTER EXAM. 2023

## SUBJECT: ADVANCED ENVIRONMENTAL ENGINEERING (HONS.)

Time : Three hours                                                                    Full Marks : 100

### Use separate answer script for each Part

### PART I (60 Marks)

**Answer all the questions:**

1. What are the sources of air pollution? Name the air polluting parameters and give their limits as per MINAS.                                                         5+ 7 =12

2. A) What are the meteorological factors affecting air pollution?                    6

   B) Define environmental & adiabatic lapse rates . Mention their standard values also.
                                                                                       4+8=12

   C) Name different types of plumes and define them with sketches.                    10

3. A) Define Hazardous waste. What are the basic characteristics of hazardous waste.  2+4=6

   B) How hazardous waste are transported?                                             5

   C) Give a brief account on treatment, storage and disposal of hazardous waste.      9

# B. E. CONSTRUCTION ENGINEERING 4TH YEAR 2ND SEMESTER EXAM. 2023

## SUBJECT: ADVANCED ENVIRONMENTAL ENGINEERING (HONS.)

Time : Three hours                                                    Full Marks : 100

**Use separate answer script for each Part**

Answer any TWO questions.          PART II  (40 Marks)

|  | No. of Questions |  | Marks |
|---|---|---|---|
| CO3 & CO5 | Q.1(a) | Explain the theory of plain sedimentation. Illustrate the various parts of a continuous flow settling tank with a neat sketch defining the salient terms and definitions associated with it. | 10 |
|  | Q.1(b) | The result of chemical analysis of a sample of raw water is given below:<br><br>$Ca^{++}$ = 80 mg/L as $CaCO_3$,<br><br>$Na^+$ = 2.5 meq/L<br><br>Total alkalinity = 80 mg/L as $CaCO_3$<br><br>Total hardness = 120 mg/L as $CaCO_3$<br><br>$SO_4^{--}$ = 20 mg/L as $CaCO_3$<br><br>$Cl^-$ = 140 mg/L as $CaCO_3$<br><br>$NO_3^-$ = 5 mg/L as $CaCO_3$<br><br>i)    Prepare a bar diagram for raw water.<br><br>Estimate the quantity in kg /day of CaO [85% pure] and soda ash [90% pure] required to soften 3ML/day of this water. | 10 |
| CO3 | Q.2(a) | Enumerate the different methods of sewage disposal. What is oxygen balance? How self- purification of streams occur? | 6+2+2 |
|  | Q.2(b) | State the various points to be considered in the design of sewage treatment units. | 5 |
|  | Q.2(c) | Explain the actions done by aerobic bacteria when sewage is passed through the beds. | 5 |
| CO2 | Q.3(a) | What are the various types of trickling filters available? Enumerate. | 8 |
|  | Q.3(b) | Draw the schematic diagrams of the primary and secondary treatment flow sheets explaining the salient features. | 12 |