| U.S.N. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

# B. M. S. College of Engineering, Bengaluru - 560019

**Autonomous Institute Affiliated to VTU**

## March - 2021 Semester End Main Examinations

**Programme: B.E.** **Semester :III**
**Branch : Chemical Engineering** **Duration: 3 hrs.**
**Course Code: 19CH3HSESP** **Max Marks: 100**
**Course: Environmental Studies and Pollution Control** **Date: 20.03.2021**

**Instructions**: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.





### UNIT - I

1. a) Discuss in detail the composition of air and the different layers of atmosphere, with a neat sketch. **12**
   b) Briefly explain in detail law on environmental protection act of 1986. **08**

### UNIT – II

2. a) Describe various water resources, types of water pollutants & their effects. **12**
   b) A new technical staff carried out the following analysis. The biological oxygen demand (BOD) on day 5, of waste water is determined to be 150mg/L at 20°C. The k value is known to be 0.23 per day and θ value is 1.047. What would be the value of BOD on day 8 if the technician carried out the experiment at 15°C ? **08**

**OR**

3. a) Explain the impacts of mining activities on environment. **07**
   b) What do you mean acid rain and ozone layer depletion? Explain. **08**
   c) If the BOD of a municipal wastewater at the end of 7 days is 60.0 mg/L and the ultimate BOD is 85.0 mg/L, what is the rate constant? **05**

### UNIT – III

4. a) Describe the working of electro dialysis cell in tertiary treatment. **06**
   b) Explain the process of reverse osmosis used as advanced waste water treatment. **06**
   c) Discuss the pollution control measures to be adopted in a typical distillery plant. **08**

**OR**

5. a) Describe in detail the secondary biological treatment for waste water. **06**

b) A column analysis carried out to determine the settling characteristics of an activated sludge suspension. The results are as shown below. **08**

| Concentration of MLSS mg/L | 1400 | 2200 | 3000 | 3700 | 4500 | 5200 |
|---|---|---|---|---|---|---|
| Velocity, m/h | 3 | 1.85 | 1.21 | 0.76 | 0.45 | 0.28 |

The influence concentration of Mixed liquor suspended solids(MLSS) is 3000 mg/L , and the flow rate of 8000$m^3$/d. Determine the size of the clarifier that will thicken the solids to 10000mg/L

c) Discuss the chemical oxidation treatment used for removing organic matter. **06**

## UNIT – IV

6. a) Describe 'photochemical smog' and discuss its harmful effects. **05**

b) Give classification and sources of air pollutants based on various factors. What are the effects of air pollution on health, vegetation and materials? **07**

c) Explain with a neat diagram the working principle of Cyclone Separator with its advantages and disadvantages. **08**

## UNIT – V

7. a) Classify and describe the functioning of mufflers used for noise pollution control. **10**

b) Discuss the important design considerations for design & operation of a landfills to control solid wastes. **10**

********