PAPER ID-310172

Roll No: ☐☐☐☐

B TECH
(SEM-VII) THEORY EXAMINATION 2020-21
IPA & WASTE MANAGEMENT

Time: *3 Hours*   Total Marks: 70

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief.   2×7=14
   a) Define primary and secondary air pollution.
   b) Define Hazardous waste.
   c) Define fugitive emission.
   d) Uses of Recycled Water.
   e) What do you mean by Composting?
   f) What are the characteristics of wastewater?
   g) What is leachate? How is it formed?

SECTION B

2. Attempt any *three* of the following: 7×3=21
   a) Derive an expression for Gaussian dispersion model with diagram.
   b) Explain the water (prevention and control of pollution) act, 1974.
   c) Discuss working of activated sludge system with the help of neat sketch.
   d) An activated-sludge system is to be used for secondary treatment of 15,000 m³/d of municipal wastewater. After primary clarification, the BOD is 170 mg/L, and it is desired to have not more than 25 mg/L of soluble BOD in the effluent. A completely mixed reactor is to be used, and pilot-plant analysis has established the following values: hydraulic detention time ()=10 d yield coefficient (Y)=0.5 kg/kg, kd=0.05 d-1. Assuming an MLSS concentration of 4500 mg/L and an underflow concentration of 12,000 mg/L from the secondary clarifier, determine (i) the volume of the reactor, (ii) the mass and volume of solids that must be wasted each day, and (iii) the recycle ratio.
   e) Explain working of Settling chambers with the help of suitable diagram.

SECTION C

3. Attempt any *one* part of the following: 7×1=7
   a) Briefly explain the air (prevention and control of pollution) act, 1981.
   b) Explain trickling filter with sketch. Discuss design parameters.

4. Attempt any *one* part of the following: 7×1=7
   a) Discuss the different types of plume behavior? Draw the neat diagrams along with it.
   b) Explain working of cyclone separator with the help of suitable diagram; also explain Design equations for cyclone separator.

5. Attempt any *one* part of the following: 7×1=7
   a) Write the standards for the fertilizer effluent. Also discuss the treatment and disposal method of fertilizer effluent.
   b) Describe the biochemical kinetics for anaerobic and aerobic treatment.

6. Attempt any *one* part of the following: 7×1=7
   a) Describe Incineration for Solid waste in brief.
   b) Write down the most important Functional Element of Solid Waste Management System.

7. Attempt any *one* part of the following: 7×1=7
   a) Describe the Physical and chemical Properties of Municipal Solid Waste.
   b) Explain Hauled container system and stationary container system with neat sketches.