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AA-603

M. Tech. EXAMINATION, May 2017

(First Semester)

(B. Scheme) (Re-appear Only)

(ESEM)

ESEM-105-B

ENVIRONMENTAL SCIENCE & ENGINEERING

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit IV

7. (a) Explain the following :

(i) Common engineering methods for removing of dissolved solids from wastewater

(ii) Disinfection techniques for water. **10**

(b) Define landfill. Discuss the important aspects in the implementation of sanitary landfill. **5**

8. (a) Give an overview of solid waste management. **10**

(b) Write down factors affecting solid waste generation. **5**

Unit I

1. Define and differentiate between the following water and waste water quality parameters, any *three* :

(i) Total ammonia and free ammonia

(ii) COD and BOD

(iii) Hydroxyl and carbonate alkalinity

(iv) Temporary and permanent hardness

(v) Mineral and carbon dioxide activity. **15**

2. Explain the principle of ozonation for disinfection of water. Give *two* advantages and *two* disadvantages of ozonation over chlorination for disinfection. **15**

Unit II

3. Define the following terms and mention their SI units : **15**

(i) surface tension

(ii) kinematic viscosity

(iii) dynamic viscosity

(iv) capillarity

(v) specific weight

(vi) mass density

(vii) pressure intensity.

4. (a) Define boundry layer thickness, momentum thickness and energy thickness and derive expression for the energy thickness for laminar flow over a flat plat. **9**

(b) Write a short note on boundry layer control methods. **6**

Unit III

5. (a) Briefly describe how primary wastewater treatment differ from secondary wastewater treatment. **10**

(b) What is lapse rate and how is it related to the dispersion of air pollutants ? **5**

6. Explain mathematically that the settling of discrete particle in a primary sedimentation tank is a function of surface area and not the depth of tank. **15**