

Registration No. :

--	--	--	--	--	--	--	--	--	--

Total number of printed pages – 3

B. Tech  
HSSM 3303(New)

**Sixth Semester (Back) Examination – 2013**  
**ENVIRONMENTAL ENGINEERING AND SAFETY**

**BRANCH : MINERAL**

**QUESTION CODE :B260**

**Full Marks – 70**

**Time : 3 Hours**

*Answer Question No. 1 which is compulsory and any **five** from the rest.*

*The figures in the right-hand margin indicate marks.*

1. Answer the following questions : 2×10
- What is meant by tolerance level of environmental factors ?
  - Mention two environmental laws dealing with various types of solid wastes.
  - Mention four sources of ground water pollution.
  - Name the types of pretreatment of water.
  - What are the three important steps for methane production during anaerobic digestion ?
  - What do you mean by super adiabatic condition of atmosphere ?
  - Differentiate between incineration and pyrolysis.
  - Write two objectives of environmental audit.
  - To which type of organization OHSAS standard is applicable ?
  - Name four fire extinguishing techniques.

**P.T.O.**

2. (a) Differentiate between a natural and a man made ecosystem. Discuss the various biotic components of a grassland ecosystem with suitable examples. 5
- (b) Determine the sound pressure level from combining the following four levels : 5  
58dB, 62dB, 65dB and 68dB.
3. (a) Explain the chlorine demand and break point chlorination with the help of a suitable graph. Mention the advantages and disadvantages of use of chlorine as a disinfectant. 6
- (b) Differentiate between slow sand filtration and rapid gravity filtration with reference to : 4
- (i) Pre-treatment
- (ii) Efficiency
- (iii) Rate of filtration
- (iv) Size of the unit
4. (a) What are the more common activated sludge systems? Discuss the complete mix reactors and plug flow reactions for treatment of wastewater. 10
5. (a) Write the concept of ALR and DALR. Sketch and explain the following two plume dispersion phenomena : 5
- (i) Looping
- (ii) Lofting
- (b) Discuss the working principle of a bag filter with labeled diagram. 5
6. (a) Determine the area required for a new landfill site with a project life of 20 years for a population of 170000 generating 23 kg per house hold per week. Assume the density of waste is  $500 \text{ kg/m}^3$ . A planning restriction limits the height of the landfill to 10m. 5
- (b) What is EIA ? Discuss the stages of EIA for environmental clearance process in India. 5

7. (a) Using the following data, calculate the severity rate of accident in an industrial plant where only one accident occurred during the year, the type of injury being cutting of tip of the finger : 5
- (i) Number of workers = 2500
  - (ii) Number of days lost in a year due to accidents = 100
  - (iii) Average number of hours worked by the workers per year = 2000
- (b) How hazards are evaluated ? Discuss the hazard control measures in an integrated steel industry. 5
8. Write short notes on any **four** : 2.5×4
- (i) Reverse Osmosis
  - (ii) Contamination of ground water
  - (iii) NO<sub>x</sub> removal
  - (iv) Hazard control measures in petroleum refineries
  - (v) Extinguishing fire
  - (vi) Biomedical hazardous wastes

