Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

HSSM 3303

Fifth Semester (Back/Special) Examination – 2013

ENVIRONMENTAL ENGINEERING AND SAFETY

BRANCH : AEIE, BIOMED, CHEM, CIVIL, EC, EEE, ELECTRICAL, ETC, IEE

QUESTION CODE : D 300

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

   (a) Mention the different steps of a water cycle.

   (b) Write two Indian environmental laws and what are their objectives ?

   (c) Name four commonly use industrial scale disinfectants.

   (d) What do you mean by super adiabatic conditions of the atmosphere ?

   (e) Mention four control measures for fugitive emissions.

   (f) Enlist four properties of hazardous wastes.

   (g) Differentiate between incineration and pyrolysis.

   (h) Waht is the needs of integration of Safety, Health and Environment ?

   (i) Mention the hazard control measures in petroleum refineries.

   (j) What are the safety handling and storage procedures of corrosive substances ?

2. (a) What are the environmental importances of nitrogen cycle ? Explain the different stages of nitrogen cycle. 5

   (b) What is mean by environmental gradients ? Draw the tolerance level graph to explain the environmental factors. 5

3. (a) What is photochemical smong ? Discuss the mechanism of formation of PAN and its adverse sffects. 5

P.T.O.

(b) Find out the daily chemical requirement in kg of a water treatment plant handling a flow of 1300 m^3/hr. 5

The optimum dosage for 1 liter is as follows :

10 mg. of 5 gm/L of alum solution

5 ml. of 4 gm/L of lime solution

2 ml. of 1 gm/L of polyelectrolyte solution.

4. What are the important characteristics of domestic waste water ? Give a flow sheet of different unit operations in municipal waste water treatment and discuss on it. 10

5. (a) What are different type of reactors in waste and waste water engineering ? Derive an expression for the final concentration of the reactant in a CSTR following first order kinetics. 5

(b) Write the concept of ALR and DALR. Sketch and explain the looping and lofting type of plum dispersion phenomenon. 5

6. (a) Suppose it takes 0.4 hours to drive from the garage to the beginning of the rout, 0.4 hours to drive between the rout and disposal site and 0.25 hours to return from the disposal site to the garage. It takes 0.2 hours to offload a truck at the disposal site. The crew is given to 15 minutes break per day and another 30 minutes are allowed for unexpected delays (total 1 hours). If two runs are made to the disposal site each day, how much time is left in an 8 hours shift for actual refuse collectioin ? 5

(b) Briefly discuss the different methods for management of hazardous wastes. 5

7. (a) Waht is a fire triangle ? Explain the important points to be observed for fire prevention. 5

(b) Explain the three -stage safety model to recognize, evaluate and control hazards for electrical safety. 5

8. Answer any **two** of the following : 5×2

(a) Box and pipe model for energy flow thorugh an ecosystem.

(b) Measurement, concept and environment impact of noise pollution.

(c) Stages of EIA for environmental clearance in India.

(d) Prevention of accident involving hazardous substances.