Registration No:

Total Number of Pages: 2

B.Tech./B.Pharm.
HSSM4403/PH7.7(Old)

Seventh Semester Examination – 2010

ENVIRONMENATL ENGINEERING

Time: 3 Hours

Max. Marks: 70

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) What is albedo? What is its percentage amount in energy budget?

   (b) What are ADR and RID classification?

   (c) Differentiate between confined and unconfined aquifer.

   (d) Write the relation between GPP and NPP in an ecosystem.

   (e) If a sound source has a pressure of 2050 µPa, compute the sound intensity level, if air density and speed of sound in air are 1,185 kg/m³ and 340m/s respectively.

   (f) Explain *limiting factor* with an example.

   (g) According to WHO what is the maximum permissible limit and highest desirable limit of fluorides in drinking water?

   (h) What is *porosity* of soil? Classify soil type according to its porosity.

   (i) What is the significance of C/N ratio in composting?

   (j) At earth surface which is the connecting link between energy budget and water budget? Write the most simplified energy budget equation.

2. (a) Sketch the following plume phenomena and discuss each sketch in relation to dry adiabatic lapse rate. (5)

      (i) Looping

      (ii) Coning

      (iii) Fanning

      (iv) Lofting

      (v) fumigating

   (b) Write the different noise standards for different categories of areas. (2)

   (c) What is coagulation? How different types of coagulants help in coagulation? (3)

3. (a) Describe the mechanism of most efficient air pollution control devices available for control of particulate emission at their sources and indicate the size range of the particulate that each type of unit is capable of removing efficiently. **(5)**

(b) The 5 day BOD of a sewage sample at 20°C is 250 mg/litre . What will be 3 day BOD at 30°C if deoxigenation rate coefficient at 20°C is 0.1/day? **(2)**

(c) What is photochemical smog? Outline its adverse effects. **(3)**

4. (a) Design a cyclone separator , if an air stream is flowing at the rate of 1020 m³/h at a temperature of 50°C. It contains particles with a density of 1050 kg/m³. Determine the diameter of the particle that will be removed with 50% efficiency if the inlet air velocity cannot exceed 12m/s and at 50°C, air density and viscosity of air are 1.25kg/m³ and 1.8×10^{-5} Ns/m² respectively. **(5)**

(b) Explain the different stages involved in EIA. How it defers from environmental auditing? **(5)**

5. (a) What is incineration? Explain the mechanism of rotary kiln incinerator and plasma arc incinerator. **(5)**

(b) Describe different NO_x and SO_x removal processes of flue gas. **(5)**

6. (a) What is environmental auditing ? Write about the steps and components of performing an EA in any industry. **(3)**

(b) Define and describe the components of **(5)**

(i) primary treatment

(ii) secondary treatment

(iii) tertiary treatment

processes of a water treatment plant.

(c) Write the biochemical reactions of aerobic and anaerobic reactions. **(2)**

7. (a) Describe activated sludge system of waste water treatment plant. How can you define the type of activated sludge system by its F/M ratio? **(3+2)**

(b) Define hazardous waste. Describe the pre-transport preparation of hazardous waste. **(2+3)**

8. Write short notes on any **two:** **(5×2)**

(i) Life cycle assessment.

(ii) Types of solids occur in water system.

(iii) Energy budget.