

Seat
No.

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मंगल - 002

Environmental Risk Assessment & Hazard Management

P. Pages : 2

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Solve **any five** questions.

1. a) Discuss the use of expert system in simulation modeling. Describe the environmental simulation modeling. Discuss the factors which are essential to examine for making the 'Environmental Simulation Model'. 20
2. a) Describe "Radioactive fallout" and discuss its environmental hazards. Discuss the control measures for low and high activity liquid radioactive waste. 20
3. Discuss the principles of chemical treatment of hazardous wastes. Describe the different chemical treatment operations for treatment of hazardous waste. 10
4. a) Explain the different components of hazard and Risk Analysis. 10
b) Discuss the different components of "Cradle-to-grave chain of management" of hazardous waste. 10
5. a) The drinking water contains 1.0 mg/lit of toluene and 0.01mg/lit of tetrachloroethylene (C_2Cl_4). An adult having weight of 75 kg consumes the water @ 2.5 LPD for 12 year. 15
 - i) Would the hazard index suggest that this was a safe level of exposure ?
 - ii) Tetrachloroethylene is a B_2 carcinogen. What would be the carcinogenic risk faced by someone drinking this water ?
The reference dose (RfD) for toluene and tetrachloroethylene are as under--
RfD (toluene) = 0.200 mg/kg-day
RfD (Tetrachloroethylene) = 0.01 mg/kg-day
The potency factor for oral intake of tetrachloroethylene is
 $5.1 \times 10^{-2} (\text{mg/kg-day})^{-1}$

- b) Discuss the onsite emergency plan and disaster control measures. 5
6. a) A risk assessment is to be performed for a proposed hazardous waste incinerator site. Briefly describe the specific factors that should be considered in each of the four steps. 10
- b) Explain in terms an ordinary citizen could understand. What is meant by
- i) One in a million risks. 5
- ii) Acceptable risk. 5
7. Discuss in details EIA and EMS to mitigate hazards in chemical industries. 20
8. Write short note on following [All]. 20
- i) Genetic algorithm.
- ii) Types of radiation.
- iii) Hazard Identification system.
- iv) Pyrolysis.
