

Indian Institute of Engineering Science and Technology, Shibpur
B.Tech. 1st Semester (Gr-I/II/III/IV) Mid-Semester Examination, January- 2023
Environment and Ecology (CE-1101)
Full Marks: 30 Time: 2 Hours

N.B: Clearly mention the part you are answering at the top of the page of your answer script. Answer to the questions should be given in the respective part only. Use a fresh page to start with a part. Answers should be brief and to the point.

Part A

Answer **any two** questions from part A

1. Define sustainable development? Mention the goals of sustainable development. (1+4=5)
2. What do you mean by ecosystem? Classify different components of ecosystem and its function (1+4=5)
3. Define the term 'Niche'. No two different species of same niche can co-exist—explain. (1+4=5)

Part-B

Answer **any two (2)** from part B.

4. (a) What is CDI? Define CDI. Explain potency factor for Carcinogens.
(b) A drinking water is found to be contaminated with Chloroform which is probable carcinogen. In order to restrict the Risk one (1) in 1 million population considering person of 70 Kg body mass who drinks 2 L/day in his or her entire life (assume: 70 years), what will be the concentration of Chloroform in the water [Given: Potency factor for chloroform – $6.1 \times 10^{-3} \text{ (mg/kg-day)}^{-1}$]
(2+3=5)
5. (a) Explain Wien's displacement rule for spectral emissions of black body with diagram
(b) A planet is found to radiate energy with a peak wave length of 9850 nm. If the surface area of the planet is $5 \times 10^{14} \text{ m}^2$, estimate the energy radiation rate corresponding to the peak wave length. (Given: Stefan-Boltzman Constant – $5.68 \times 10^{-8} \text{ W/m}^2 \cdot \text{K}^4$, Plank's constant – $6.6 \times 10^{-34} \text{ J-s}$, Speed of light – $3 \times 10^{10} \text{ cm/s}$)
(2+3=5)
6. (a) Define "Fund Pollutant" with example
(b) Identify group/ category as per behavioral properties of the following pollutants.
Carbon tetra-chloride, Poly chlorinated bi-phenyl, Methane, Benzo-pyrene
(c) A truck containing tons of sugar accidentally fell into a pond in your locality. The truck was rescued but sugar got dissolved in water. Sugar being non-toxic, the local authority paid no attention. Days later, local people observed that fishes & other aquatic species in the pond were dying. Explain cause(s) of such happening from the perspective of Ecology & Environment (answer should be brief, 4-5 lines maximum)
(1+2+2=5)

P.T.O

70kg \rightarrow 2 L/day

2.59 2.750