UPES

End Semester Examination, December 2023

Course: Environmental Engineering & Management   Semester: I
Program: M.TECH HSE   Time   : 03 hrs.
Course Code: HSFS 7001   Max. Marks: 100
Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Explain the factors affecting the selection of the particulate air control devices.	4	CO2
Q 2	Explain the diverse applications of coagulants in various industries and processes	4	CO2
Q 3	What are the key elements in EIA as per Government of India notification?	4	CO1
Q 4	Identify and elaborate on the multiple factors influencing the composting process.	4	CO3
Q 5	Explain the relationship between climate change and biodiversity loss, providing specific examples to illustrate the connection	4	CO3

SECTION B
(4Qx10M= 40 Marks)

Q 6	Analyze the significance of water impurities in determining water sample potability, outlining the common impurities that require consideration. Elaborate on the essential tests that should be conducted on a water sample to assess its suitability for consumption	10	CO4
Q 7	Differentiate between Hauled Container System & Stationary Container System with their application.	10	CO2
Q 8	Illustrate and describe the behavior of plumes under varying atmospheric conditions, accompanied by a clear diagram.	10	CO3
Q 9	An oil pipeline leak results in emission of l00g/h of H2S. On a very sunny summer day, with a wind speed of 3.0 m/s, what will be the concentration of H_2S 1.5 km directly downwind from the leak? Note : σy is approximately 210m and σz is approximately 160m. **OR** Explain the Gaussian plume dispersion equation for the gaseous pollutants	10	CO4

SECTION-C
(2Qx20M=40 Marks)

Q 10	a) A coal-burning electric generating plant emits 1.1 kg/min of SO_2 from a stack with an effective height of 60m. On a thinly overcast evening, with a wind speed of 5.0 m/s , what will be the ground level concentration of SO_2 500 m directly downwind from the stack? Note: at $x = 0.5$ km, σy is approximately 35 m and σz, is approximately 19 m. b) A large power plant has 250m stack with inside radius 2m exit velocity of the stack gas is estimated at 25m/s at the temperature of 140^0c. Ambient temperature is 25^0c and the wind at stack height is estimated to be 5m/s. Estimate the effective height of the stack. If i. The atmosphere is stable with temperature increasing at the rate of 2^0/km. ii. The temperature is slightly unstable class C	20	CO5
Q 11	An Investor wants to put up an Industrial Plant for the manufacture of paper and its derivatives for both local and external market. The Investor intends to establish the paper manufacturing mill in relatively wet and forested upper parts of Dehradun District. Apart from the paper mill, the Investor will also provide infrastructure and social amenities in the region. In view of the socio-economic and bio-physical environmental implications that may result due to the proposal, there has been public debate particularly on the loss of habitat/biodiversity and competition for scarce water resources in the region. Assuming your consultancy firm has won a contract to undertake Environmental Impact Assessment (EIA) study on this proposed project: Discuss the logical steps in the EIA process that your study team is likely to follow to achieve the task assigned to you. Justify the formation of the Interdisciplinary Team for this EIA study. OR Explain the key considerations in the design of landfills, and support your explanation with a well-labeled diagram illustrating the essential components and features of an effective landfill design	20	CO5