Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Program: B.Tech (FSE) **Semester –VI**
Subject (Course): Environmental Engineering & Management **Max. Marks : 100**
Course Code: HSFS3010 **Duration : 3 Hrs**

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Water quality testing is an important part of environmental monitoring. When water quality is poor, it affects not only aquatic life but the surrounding ecosystem as well. Illustrate chemical water quality parameters.	**4**	**CO2**
Q 2	Compare vermicomposting and composting	**4**	**CO2**
Q 3	Differentiate between permanent hardness and temporary hardness.	**4**	**CO1**
Q 4	Researchers say the water crisis in Flint, Michigan, is nearing an end as tests show significantly fewer homes have water contaminated with heavy metals and other pollutant. The situation there has heightened awareness about drinking water contamination nationwide, which could be more widespread than the public realizes and people has started drinking bottled water. Is Bottled Water Safer and Cleaner than Tap Water? Justify	**4**	**CO3**
Q 5	Discuss briefly about designing aspect of sedimentation tank with standard dimension for wastewater treatment system.	**4**	**CO5**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	A test bottle containing just seeded dilution water where its DO level drop by 1 mg/l in a 5-day test. A 300ml BOD bottle filled with 15 ml of wastewater and the rest seeded dilution water experiences a drop of 7.2mg/l in the same time. What would be the 5-day BOD of the wastewater?	**10**	**CO4**
Q 7	The Dilution Factor P for an unseeded mixture of waste and water is 0. 030. The DO of the mixture is initially 8.4.0mg/L, and after five days, it has dropped to 2.6.0mg/L. The reaction rate constant K has been found to be 0.20 $days^{-1}$. i. What is the five-day BOD of the waste? ii. What would be the ultimate carbonaceous BOD? iii. What would be the remaining Oxygen demand after five	**10**	**CO5**

	days?		
Q 8	Find the BOD of a seeded water sample at 25^{OC} and 30^{OC} if it has 300mg/l ultimate BOD at 20^{OC}. Consider dilution factor K=0.33.	**10**	**CO3**
Q 9	Describe following , a. Hypo chlorination b. Gas chlorination c. Disinfection d. Drawbacks of UV light Filtration	**10**	**CO2**
SECTION-C (2Qx20M=40 Marks)			
Q 10	A large power plant has a 200 m stack with inside diameter of 1m. The exit velocity of the stack gas is estimated at 7 m/s at the temperature of 130^0C. Ambient temperature is 23^0C and the wind at stack height is estimated to be 3m/s. Estimate the total effective height of the stack. If a. The atmosphere is stable with temperature increasing at the rate of 2^0C/km. The temperature is slightly unstable.	**20**	**CO4**
Q 11	You are appointed as HSE engineer and have been tasked to carry out site investigations for a construction site. Describe the investigation procedure and discuss what information is required for the preparation of shredder unit for wastewater treatment plant. Enumerate the following with designing principle: a) Cyclone Separator b) Dry & Wet Scrubber c) Subsidence & Radiant Inversion d) Atmospheric Stability	**20**	**CO5**