GURU NANAK INSTITUTE OF TECHNOLOGY

An Autonomous Institute under MAKAUT

2022

ENVIRONMENTAL ENGINEERING

CH(FT)302

TIME ALLOTTED: 3HR **FULL MARKS:70**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

(Multiple Choice Type Questions)

Answer any ***ten*** from the following, choosing the correct alternative of each question: 10×1=10

			Marks	CO No
1.	(i)	A commonly used coagulant used for waste water treatment is a) Alum b) Trickling Filter c) Molecular sieves d) Calcium Bicarbonate	1	CO3
	(ii)	Autecology can also be termed as a) Population ecology b) landscape ecology c) Community ecology d) None of these	1	CO2
	(iii)	Environmental resistance factor is (symbols have their usual meaning) a) rN b) 1-N/K c) K d) $rN_0(1-N/K)$	1	CO4
	(iv)	Sound intensity for aircraft noise is commonly measured in the units of a) L_{epn} b) $Watt/m^2$ c) Decibel d) none of these	1	CO2
	(v)	Kyoto Protocol is directly related to? a) Green House Effect b) Ozone Layer Depletion c) Acid Rain Formation d) Sustainable Development	1	CO1
	(vi)	The value of earth's albedo is a) 0.21 b) 0.031 c) 0.021 d) 0.31	1	CO2

(vii)	The region of atmosphere that is important for telecommunication purpose is known as a) Troposphere b) Mesosphere c) Stratosphere d) Thermosphere	1	CO4
(viii)	Which one is not a Green House Gas? a) CO_2 b) N_2 c) Water vapor d) CH_4	1	CO3
(ix)	The decomposers could be a) amoeba b) fungi c) earthworm d) all of these	1	CO2
(x)	Sulphur cycle is a) hydrologic cycle b) gaseous cycle c) sedimentary cycle d) bio-geochemical cycle	1	CO3
(xi)	Identify the prime component of sulphurous smog a) water b) sulphur dioxide c) carbon dioxide d) carbon monoxide	1	CO4
(xii)	The frozen water resources are commonly known as a) Heliosphere b) Cryosphere c) Hemisphere d) Lithosphere	1	CO1

GROUP – B
(Short Answer Type Questions)

Answer any ***three*** from the following: **3×5=15**

		Marks	CO No
2.	Define "Energy Flow" in eco system. In an eco system, although the inorganic nutrients are recycled, the flow of energy is not. Justify.	5	CO1
3.	Essential nutrient can also act as water pollutants. Justify.	5	CO2
4.	Justify the positive impact of green house gases on the earth's surface.	5	CO4
5.	What is photochemical smog? Write down the reactions involved in formation of PAN.	5	CO3
6.	Show that Maximum Sustainable Yield is achieved when N=K/2. Symbols have their own meaning.	5	CO1

GROUP – C
(Long Answer Type Questions)
Answer any ***three*** from the following: **3×15=45**

			Marks	CO No
7.	(a)	What will the ratio of BOD_5 at 20 °C, to that of $BOD_{2.5}$ at 35°C?	3	CO4
	(b)	A 10 mL of sewage water mixed with enough water to fill a 300 mL bottle has an initial DO of 9.0 mg/L. To help assure an accurate test, it is desirable to have at least a 2.0 mg/L drop in DO during the five day run, and the final DO should be at least 2.0 mg/L. For what range of BOD5 would this dilution produce the desired result?	5	CO4
	(c)	What are the essential characteristics of hazardous waste?	2	CO2
	(d)	What is the importance of atmospheric stability? How can we describe atmospheric stability with ALR and ELR?	5	CO4
8.	(a)	What are the adverse effects of acid rain on ecosystem and human civilization? What measures can be taken to control acid rain?	5	CO1
	(b)	If two machines produce 80 dB sounds simultaneously, what will be the total sound level?	3	CO4
	(c)	Describe the origin of Green House Effect using Global Temperature Model.	5	CO4
	(d)	What is the significance of bio-magnification in food chain?	2	CO1
9.	(a)	What is maximum mixing depth and ventilation coefficient? How does atmospheric stability depend on them?	5	CO1
	(b)	What is incineration? How is it applicable in solid waste management issues?	5	CO3
	(c)	Inorganic mercury is fairly non-toxic. Prior to the Minamata disease in Japan, the Minamata chemical company excluded the inorganic mercury effluents to the Minamata bay. But the fishes were found to contain CH_3Hg+ which is highly toxic. Explain the missing link.	5	CO2
10.	(a)	What is temperature inversion? How it is different from normal Lapse Rate?	5	CO4
	(b)	Discuss the different layers of ground water with diagram.	5	CO2
	(c)	A work area is composed of 95 dB sound level for 1 hr., 80 dB for 3hrs and 75 dB for 4hrs. Maximum permissible limits for 95 dB is 2 hrs per day, for 80 db is 16 hrs per day and infinite time for 75 dB. Predict whether the work area is suitable for health or not.	5	CO3
11.		Write short notes on (any three)	3×5=15	
	(a)	Step function approach for Material Balance Equation	5	CO2
	(b)	Harmful effects of ground level ozone	5	CO3
	(c)	Structural aspects of Lithosphere	5	CO1
	(d)	Characteristics of Logistic Growth Model plots	5	CO4
	(e)	Dissolved Oxygen (DO) as a water quality parameter	5	CO3