INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

Test 2 2021-22

Date of Examination: **22.06.2022** Session: **FN** Full Marks: **60** Duration: **1.5 h**
Subject No.: **EV10003** Subject Name: **ENVIRONMENTAL SCIENCE** **Section: 15 & 16**
Specific charts, graph paper, log book etc., required: **NIL**
Special Instructions (if any): *All questions are compulsory.*

A. FILL IN THE BLANKS

Part 1 (5x2=10)

1. _____ is a graph which showing seasonal and annual changes in atmospheric carbon dioxide (CO2) concentrations since 1958 at the Mauna Loa Observatory
2. PAN is formed due to presence of _____ in the air
3. The detrimental health impact of Photochemical smog is mainly associated with _____
4. When dissolved salts in water tables rise to the soil surface and accumulate as water evaporates indicates that _____ occurs.
5. When Liquid hazardous wastes are pumped under pressure into dry porous rock far beneath aquifers, the process is called _____

B. **MATCH THE COLUMNS 'A' AND 'B': (2x5=10)**

A		**B**	
a.	CH_4	**i.**	Vehicular emission
b.	Tropospheric O_3	**ii.**	Ozone hole
c.	Chlorofluoro carbon	**iii.**	Global warming
d.	NOx	**iv.**	Acid rain
e.	Lead	**v.**	Lung cancer

C. STATE TRUE OR FALSE (5x1=5)

1. Metal is a renewable resource
2. Integrated waste management involved a variety of strategies for both waste reduction and waste management
3. Among the global environmental issues, climate change is perceived as the top environmental concerns.
4. Sanitary landfills are sites where waste is burned.
5. Biostimulating is Injection of air/nutrients into unsaturated and saturated zones

D. Solve the flowing problems (3x5=15)

1. A 600 MW power plant burns 5 $x10^8$ kg coal per year. A Flue gas desulfurization is installed, where the limestone requirement is 2.5% more than the stoichiometry. The coal contains 2% sulphur by weight and that 97% of the sulphur is converted to SO_2. Calculate the lime stone requirement per year.

2. The carbon content of coal is 70%. Calculate the CO_2 emissions per day if the plant burns $3x10^8$ kg coal per day.

3. The settling velocity of a spherical droplet of water with diameter 0.5 µm, and (assuming the Viscosity of air, µ = 0.0172 g/m/s and density of air can be neglected) estimate the residence time of the particle suspended in air at an altitude of 1000m.

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E. Write short note on the following **the following questions (5x4 =20)**

a. In situ bioremediation
b. Photochemical smog
c. Kyoto Protocol
d. Sanitary landfills
e. Control of Soils Pollution

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