Birla Institute of Technology & Science Pilani, Pilani Campus, Rajasthan 333 031

MIDSEM Examination, First Semester 2023-2024

Course Number: CHEM G521 **Course Title: Environmental Chemistry**

Max. Marks: 30 **Date: 13 Oct 2023** **OPEN BOOK** **Time: 60 min**

Important Instructions

- **There are THREE questions printed in the question paper**
- **Answer all questions in the answer booklet only**
- **DO NOT use pencils for answering any part, even graphics**
- **Start answering each question from a fresh page, all sub-sections together**

Q.1 (a) Briefly describe the terms BOD, COD and TOC related to water pollution.

(b) A colored substance E has an absorption maximum at 350 nm. A solution containing 2 mmol/L of a compound E had an absorbance of 0.56 using a 1-cm cuvette in a UV-Vis spectrometer. The molecular weight of E is 200 g/mol. (i) Calculate the molar absorptivity of E at 350 nm; (ii) Will there be any change in any of the parameters amongst 'absorbance', 'molar absorptivity' and 'absorption maximum', if the test was performed using a cuvette of path length 5 cm? – Justify showing reasons/ calculations as appropriate.

(c) How is ONPG test conducted? **[3+(2+4)+1=10M]**

Q.2. (a) Convert 0.055 absorbance into percent transmittance.

(b) (i) How can conductivity test utilized for the analysis of dissolved solids in a water sample? (ii) A solution has a conductivity of 200 mS/m. Convert this value in μmhos/cm unit.

(c) What is TEL used for? State the reasons for its banning and mention alternative chemicals used for the same purpose.

(d) (a) (i) What do you mean by MCL of contaminants in drinking water? (ii) Explain the statement – 'Sometimes COD is obtained as more than double of the BOD of the same sample'.

[2+(3+1)+3+2=11M]

Q.3. (a) What is the importance of Keeling curve?

(b) **(i)** What is the principle used in the process of petroleum refining? **(ii)** Describe the importance of 'Cracking' and 'Alkylation' for generation of different chamicals from pertro-crude.

(c) Describe the functioning of solar photovoltaic cells for electricity generation.

(d) What is LIMS? **[2+(1+2)+2+2=9M]**

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