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Name:

Reg.No:

FOURTH SEMESTER INTEGRATED M.Sc. GEOLOGY DEGREE EXAMINATION, APRIL 2026

(CBCSS)

(Regular/Supplementary/Improvement)

CC23CHE4IC04 - PHYSICAL AND APPLIED CHEMISTRY

(Chemistry)

(2023 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. What is meant by ultrafiltration?
2. What does the term micelle mean?
3. What is meant by emulsion?
4. What is nanotechnology?
5. Calculate the energy of a radiation that has a wave number 0.005 nm^{-1}
6. Give the equation for the preparation of a condensation polymer.
7. Name a thermoplastic and a thermosetting plastic.
8. Which are the major culprits for stratospheric ozone depletion?
9. What does the term COD mean with respect to the quality of a sample of water?
10. Mention two adverse consequences of thermal pollution.
11. What is meant by cetane number?
12. What are analgesics? Give an example.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. Discuss the applications of nanomaterials in medicine.
14. State any three of the twelve principles of green chemistry.
15. Evaluate the merits and demerits of liquid-solid chromatography.
16. What are the different types of electronic transitions in molecules? Arrange them in the increasing order of energy.

17. How can the NMR method be used to distinguish between the structures of propan-1-ol and propan-2-ol ?
18. What are artificial sweeteners? Explain with suitable examples.
19. Write an explanatory note on the setting of cement. What is the role of gypsum in the process?

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Discuss the significance of the concept of group frequencies in IR spectroscopy and its application in organic structural elucidation.
21. Explain the term 'dye'. a) Explain the requirements of a good dye. b) Draw the structures of martius yellow and indigo and discuss their applications.

(1 × 10 = 10 Marks)
