36523

V Semester B.Sc. Degree Examination, November/December 2019

Paper 5.1 — CHEMISTRY — V

(New Syllabus) (CBCS)

Time : 3 Hours

Max. Marks : 70

Instructions :

1) Section A – contains questions from Inorganic, Organic and Physical Chemistry.

2) Section B – contains questions from Inorganic Chemistry.
   Section C – contains questions from Organic Chemistry.
   Section D – contains questions from Physical Chemistry.

3) Answer **all** the four Sections A, B, C and D.

SECTION – A

Answer **any ten** of the following :

(10 × 2 = 20)

1. Cu^{2+} ions are coloured while Zn^{2+} ions are colourless. Give reason.

2. What is micro state?

3. What are carboranes?

4. What are intercalation compounds?

5. What are equivalent protons?

6. Write the IUPAC name of C_2H_5SH.

7. What is meant by essential amino acids?

8. Arrange the increasing order of stretching frequencies of $C \equiv C$, $C = C$ and $C - C$.

9. Give two examples for molecules with permanent dipole moment.

10. State Einstein law of photochemical equivalence.

11. What is chemiluminescence?

12. Define induced polarization?

P.T.O.

SECTION – B

Answer **any two** of the following :   **(2 × 10 = 20)**

13. (a) Determine the term symbols for an electronic configuration of P^2.   **(6)**

  (b) Write a note on temperature independent paramagnetism.   **(4)**

14. (a) Discuss the electronic spectrum of $[Ti(H_2O)_6]^{3+}$ complex ion.   **(6)**

  (b) Give the preparation and properties of S_4N_4.   **(4)**

15. (a) How do you determine magnetic susceptibility and magnetic moment by Guoy's method?   **(6)**

  (b) Write a note on charge transfer spectra.   **(4)**

SECTION – C

Answer **any two** of the following :   **(2 × 10 = 20)**

16. (a) Describe the principle and applications of NMR spectra.   **(6)**

  (b) Give any two methods of preparation of thiols.   **(4)**

17. (a) Discuss the classification and structure of amino acids.   **(6)**

  (b) Describe the basic components of spectrophotometer.   **(4)**

18. (a) Explain principle and instrumentation of IR spectroscopy.   **(6)**

  (b) Write a note on :   **(4)**

   (i) Magnetic Anisotopy.

   (ii) $(N+1)$ rule.

SECTION – D

Answer **any two** of the following :   **(2 × 10 = 20)**

19. (a) Define Quantum yield. Give reasons for (i) high quantum yield (ii) low quantum yield.   **(6)**

  (b) Calculate the value of Einstein's energy for the radiation of wavelength 4000 Å.   **(4)**

20. (a) Discuss the applications of dipole moment in elucidation structure of BF_3 and CO_2.   **(6)**

  (b) Explain : (i) Photo inhibition (ii) Photo sensitization.   **(4)**

21. (a) Give Clausius-Mosotti equation. Explain the terms and discuss its importance.   **(6)**

  (b) State and explain Beer's law.   **(4)**

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