

Reg. No. :

Code No. : 30077 E Sub. Code : GMCH 63

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2020.

Sixth Semester

Chemistry – Main

PHYSICAL CHEMISTRY – IV

(For those who joined in July 2012–2015 onwards)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. ΔG for a photochemical reaction is
 - (a) 0
 - (b) –ve
 - (c) +ve
 - (d) +ve or –ve
2. The emission of light by a firefly is due to
 - (a) Fluorescence
 - (b) Phosphorescence
 - (c) Photosensitization
 - (d) Chemiluminescence
3. The dipole moment value for symmetrical molecules is
 - (a) 0
 - (b) 1
 - (c) 2
 - (d) 3

4. ESR spectrum is shown by
(a) benzene (b) toluene
(c) methane (d) methylradical
5. In low resolution NMR spectrum the number of signals obtained for ethanol is
(a) 1 (b) 2
(c) 3 (d) 4
6. Which of the following molecule shows a rotational spectra.
(a) H_2 (b) CH_4
(c) CO_2 (d) HCl
7. The symbol for proper axis of rotation is
(a) S_n (b) E
(c) σ (d) C_n
8. C_{2v} point group is assigned to
(a) H_2O (b) CO_2
(c) B_7_3 (d) CH_4
9. 1nm is equal to
(a) 9m (b) 9cm
(c) $10^{-9}m$ (d) $10^{-9}cm$
10. Nano compounds can be prepared by
(a) Vapour deposition method
(b) Reduction
(c) Sol-Gel method
(d) All the above

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Write the differences between thermal and photochemical reactions.

Or

- (b) Explain phosphorescence.

12. (a) Write the application of rotational spectrum.

Or

- (b) Explain force constant.

13. (a) Write the differences between Raman spectra and IR spectra.

Or

- (b) Explain chemical shift.

14. (a) Explain the elements of symmetry.

Or

- (b) Explain the character table for C_{2v} point group.

15. (a) Write any one method of synthesis of Nano particles.

Or

- (b) Explain Nano clusters.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b)

16. (a) Explain photochemical decomposition of HI.

Or

- (b) Write the applications of Lasers.

17. (a) Write the applications of IR spectra.

Or

- (b) Explain rotational spectra of diatomic molecules.

18. (a) Write the advantages of Raman Spectroscopy over IR spectroscopy.

Or

- (b) Give the applications of NMR spectroscopy.

19. (a) Explain Abelian and cyclic groups.

Or

- (b) Explain C_{3v} character table.

20. (a) Write the applications of CNT.

Or

- (b) Write the applications of Nanochemistry in various fields.