

Code No. : 10448 E Sub. Code : CMCH 31

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Third Semester

Chemistry — Core

PHYSICAL CHEMISTRY — I

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- PV = constant at constant temperature is called
 - Charle's law
 - Avogadro's law
 - Boyle's law
 - None of these

- Radio carbon dating was developed by
 - M. Curie
 - M. Calvin
 - H. Bequerel
 - W.F. Libby
- Geiger nattal rule states that
 - $\log \lambda = c \log R + b$
 - $\log c = \lambda \log R + b$
 - $\log b = c \log R + \lambda$
 - None of the above
- During photosynthesis chlorophyll act as a
 - Catalyst
 - Sensitizer
 - Promotor
 - None of the above
- Delayed fluorescence is called
 - Fluorescence
 - Phosphorescence
 - Chemiluminescence
 - Bioluminescence

- $\frac{\sqrt{8RT}}{\pi m}$ is called
 - average velocity
 - most probable velocity
 - root mean square velocity
 - none of these
- CST of Phenol-H₂O system — on adding NaCl.
 - Increase
 - Decrease
 - No change
 - Can't be predicted
- Ideal solution obey —.
 - Henry's law
 - Raoult's law
 - Boyle's law
 - Graham's law
- Which one of the following material does possess same electrical conductivity in all directions?
 - NaCl solution
 - Glass
 - Molten NaCl
 - Solid NaCl
- The co-ordination number for an atom in fcc structure is —.
 - 4
 - 6
 - 8
 - 2

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).
Each answer should not exceed 250 words.

- Discuss the merits and demerits of kinetic equation.

Or

 - Explain compressibility of gases.
- Write a note on Raoult's law of binary liquid mixture.

Or

 - Write a note on azeotropic distillation.
- Write a note on elements of symmetry.

Or

 - Explain Miller indices with an example.
- Write notes on magic numbers.

Or

 - Write note on mass defect.
- Explain the primary and secondary process of an photochemical reaction with an example.

Or

 - Write a note on fluorescence.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).
Each answer should not exceed 600 words.

16. (a) Discuss in detail Maxwell's distribution of molecular velocities.

Or

- (b) Explain the term co-efficient of viscosity. How is this parameter used for calculating the mean free path and collision diameter of a gas?

17. (a) State and explain trouton's rule.

Or

- (b) Explain the theory of fractional distillation of miscible liquids.

18. (a) Derive lattice energy using Born Lande equation.

Or

- (b) Draw and explain the structure of NaCl.

19. (a) Explain a method for separation of Isotopes.

Or

- (b) How is age of wood is determined by radioactivity?

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20. (a) Explain photosensitization with an example.

Or

- (b) Explain the fate of excited states.
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