(6 pages) **Reg. No. :** .....

Code No. : 33006 E **Sub. Code : AMCH 11**

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

First Semester

Chemistry – Core

PHYSICAL CHEMISTRY – I

(For those who joined in July 2020 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)
Answer ALL questions.
Choose the correct answer :

1. According to kinetic theory of gases, the kinetic energy is depends on ————————.

   (a) pressure (b) temperature

   (c) mass (d) atomic number

2. The number of vibrations in H_2O molecule is

   (a) 2 (b) 3

   (c) 4 (d) 6

3. The light emitted in a chemiluminescent reaction is called ————————.

(a) cold light (b) hot light

(c) bright light (d) fluorescence

4. For a reaction that obeys Einstein law,

(a) $\phi = 0$ (b) $\phi = 1$

(c) $\phi < 1$ (d) $\phi > 1$

5. The n/p ratio of $_7N^{14}$ is

(a) 1 (b) 2

(c) 3 (d) 4

6. Atom bomb is based on the principle of

(a) Nuclear fission (b) Nuclear fusion

(c) n/p ratio (d) Mass defect

7. The type of defect observed in ZnS is

(a) Schottky defect

(b) Frenkel defect

(c) Metal excess defect

(d) Metal deficency defect

8. The number of atoms in a BCC crystal is

(a) 1 (b) 2

(c) 3 (d) 4

9. According to the law of osmotic pressure

(a) $\pi \alpha C$ (b) $\pi \alpha \frac{1}{C}$

(c) $\pi \alpha V$ (d) $\pi = RT$

10. Which of the following is a colligative property?

(a) osmotic pressure

(b) elevation of boiling point

(c) depression of freezing point

(d) all the above

PART B — ($5 \times 5 = 25$ marks)

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

Each answer should not exceed 250 words.

11. (a) State and explain mean free path.

Or

(b) Give the postulates of kinetic theory of gases.

12. (a) Define Chemiluminescence with example.

Or

(b) State and explain Beer-Lamber law.

13. (a) Explain the role of radio active isotopes in the study of reaction mechanism.

Or

(b) Write and explain the principle of Steller energy.

14. (a) What are non-stochiometric defect? Explain.

Or

(b) State and explain radions – ratio rule.

15. (a) Define : (2.5 + 2.5)

(i) Ebullioscopic constant

(ii) Cryoscopic constant.

Or

(b) What are colligative properties? Explain.

PART C — ($5 \times 8 = 40$ marks)

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

16. (a) Discuss Maxwell-Boltzmann law of molecular velocities and the effect of temperature on it.

Or

(b) State and explain the principle of equipartition energy.

17. (a) Draw and explain Jablonski diagram.

Or

(b) Explain the kinetics and mechanism of H_2–Cl_2 reaction.

18. (a) Explain the following : (4 + 4)

(i) Magic numbers

(ii) Mass defect.

Or

(b) Write note on :

(i) Liquid-drop model. (4)

(ii) Half-life period. (4)

19. (a) Describe Schottky and Frenkel defects.

Or

(b) Discuss the structure of NaCl and ZnS crystal.

20. (a) Write note on :

(i) Osmotic pressure. (4)

(ii) Van't Hoff factor. (4)

Or

(b) How will determine the depression of freezing point.

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