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

Code No. : 40278 E **Sub. Code : JMCH 12/ SMCH 12**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2019.

First Semester

Chemistry – Main

PHYSICAL CHEMISTRY – I

(For those who joined in July 2016 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. 'At constant temperature, the volume of a fixed mass of gas is inversely proportional to its pressure'. This law is

   (a) Maxwell's distribution law

   (b) Charle's law

   (c) Boyle's law

   (d) Avogadro's law

2. The unit of gas constant is

   (a) erg K^{-1} mol^{-1}

   (b) Cal K^{-1} mol^{-1}

   (c) Joule K^{-1} mol^{-1}

   (d) All the above

3. 'It is only the absorbed light radiations that are effective in producing a chemical reaction'. This is

   (a) Lambert law

   (b) Lambert – Beer law

   (c) Grotthus – Draper law

   (d) Stark – Einstein law

4. A species which can both absorb and transfer radient energy for activation of the reactant molecule is

   (a) radioactive substance

   (b) photosensitizer

   (c) ioniser

   (d) photochemical substance

5. Uranium gives the stable isotope of

(a) radon

(b) krypton

(c) polonium

(d) radium

6. The correct symbol for an alpha particle is

(a) $^{4}_{2}He$

(b) $^{1}_{0}n$

(c) $^{0}_{-1}e$

(d) $^{1}_{1}p$

7. A crystalline solid has

(a) Definite geometrical shape

(b) Flat faces

(c) Sharp edges

(d) All the above

8. In Frenkel defect

(a) Some of the lattice sites are vacant

(b) An ion occupies interstitial position

(c) Some of the cations are replaced by foreign ions

(d) None of the above

9. The formula used to find out the elevation in boiling point is

(a) $\Delta T = k_b . \frac{w}{m} \times \frac{1}{W}$

(b) $k_b = \Delta T . \frac{w}{m} \times \frac{1}{W}$

(c) $\Delta T = k_b . \frac{m}{w} \times W$

(d) $\Delta T = \frac{w}{m} . \frac{w}{k_b}$

10. The molecular mass (M) of the solute can be calculated by the formula

(a) $M = \frac{wRT}{\pi v}$ (b) $M = \frac{wRT}{\pi v^2}$

(c) $M = \frac{wRT^2}{\pi v}$ (d) $M = \sqrt{\frac{wRT}{\pi v^2}}$

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Calculate the RMS velocity of chlorine molecular at 12°C and 78 cm pressure.

Or

(b) Explain the most probable velocity and average velocity.

20. (a) Explain briefly any two methods to determine the elevation of boiling point.

Or

(b) Describe briefly the relation between the lowering of vapour pressure and osmotic pressure.
