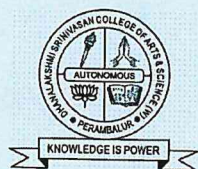


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**DHANALAKSHMI SRINIVASAN COLLEGE  
OF ARTS & SCIENCE FOR WOMEN  
(AUTONOMOUS)**



(For Candidates admitted from 2018-2019 onwards)

**UG DEGREE EXAMINATIONS APRIL – 2021**

**B.SC - CHEMISTRY**

**PHYSICAL CHEMISTRY - II**

**Time: 3 Hrs**

**Max.Marks: 75**

**PART – A**

**CHOOSE THE CORRECT ANSWER.**

**(10\*1=10)**

1. The concept of matter wave was suggested by \_\_\_\_\_  
 a) Heisenberg      b) de Broglie      c) Schrodinger      d) Laplace
2. If there exist only one eigen function corresponding to a given eigen value, then the eigen value is called \_\_\_\_\_  
 a) Non degenerate      b) degenerate      c) discrete      d) continuum
3. In an electrochemical cell oxidation takes place at  
 a) the anode      b) the cathode      c) the electrode      d) the salt bridge
4. The salt bridge in the electrochemical cell serves to  
 a) increase the rate at which equilibrium is attained  
 b) increase the voltage to the cell  
 c) maintain electrical neutrality  
 d) increase the oxidation/ reduction rate
5. A mixture of three gases O<sub>2</sub>, N<sub>2</sub> and CO<sub>2</sub> is  
 a) 1-phase system      b) 2-phase system      c) 3-phase system      d) 4-phase system
6. For one component system, at triple point the number off degrees of freedom is  
 a) zero      b) one      c) two      d) three
7. The entropy is expressed in  
 a) calories      b) calories per degree      c) ergs      d) unit
8. Pick out the correct equation  
 a)  $A = E + TS$       b)  $A = H + TS$       c)  $A = E - PV$       d)  $A = E - TS$
9. When water freezes, its entropy  
 a) increases      b) decreases      c) remains the same      d) become zero

10. The equation for van't Hoff isotherm is

a)  $-\Delta G = 2.303RT \log K_p$

b)  $\Delta G = 2.303 RT \log K_p$

c)  $-\Delta G = 2.303RT^2 \log K_p$

d)  $\Delta G = 2.303RT^2 \log K_p$

**PART – B**

**ANSWER ALL THE QUESTIONS**

**(5\*7=35)**

11. a) Derive the time independent Schrodinger equation and explain their physical significance.

**(OR)**

b) Discuss the physical interpretation of eigen values and eigen functions.

12. a) Illustrate of reversible and irreversible electrochemical cells.

**(OR)**

b) Describe the construction and working of calomel electrode.

13. a) Sketch and explain the phase diagram for the sulphur system.

**(OR)**

b) Narrate the principle and application of steam distillation

14. a) Show that  $dA = -PdV - SdT$ .

**(OR)**

b) Explain the working of Carnot's cycle.

15. a) Derive Nernst heat theorem.

**(OR)**

b) Discuss the thermodynamic derivation of law of mass action.

**PART – C**

**ANSWER ANY THREE QUESTIONS.**

**(3\*10=30)**

16. Discuss the followings

(i) Bohr's model of hydrogen atom

(ii) de Broglie hypothesis.

17. Derive Nernst equation showing effect of electrode concentration on the potential of an oxidation reduction electrode.

18. Explain the critical solution temperature of phenol – water system.

19. Derive Gibbs – Helmholtz equation and its application.

20. Determine absolute entropy of solid from third law of thermodynamics.