

CHE201 SOLVED MCQS
(VISIT VURANK FOR MORE)

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1. The study of the underlying physical principles that govern the properties and behavior of chemical systems.
 - a) Thermodynamics
 - b) Physics
 - c) **Physical chemistry**
 - d) Analytical chemistry
2. ----- is based on the concept of molecules.
 - a) **Macroscopic viewpoint**
 - b) Microscopic viewpoint
3. ----- large-scale properties of matter explicit use of the molecule concept.
 - a) Microscopic viewpoint
 - b) **Macroscopic viewpoint**
4. ----- is the study of heat, work, energy, and the changes they produce in the states of systems.
 - a) Physical chemistry
 - b) **Thermodynamics**
 - c) Chemistry
 - d) Analytical chemistry

5. Thermodynamics studies the relationships between the -----properties of a system
- a) **Macroscopic**
 - b) Microscopic
6. Independent of molecular theories of structures?
- a) **Equilibrium thermodynamics**
 - b) Irreversible thermodynamics
7. A non-isolated system is in equilibrium when the following conditions hold :
- a) The system's macroscopic properties remain constant with time
 - b) Removal of the system from contact with its surroundings causes no change in the properties of the system
 - c) **Both a and b**
 - d) None
8. A homogeneous part of a system is called
- a) Equilibrium
 - b) **Phase**
 - c) Open system
 - d) Closed system
9. -----thermodynamic property is one whose value is equal to the sum of its values for the parts of the system.
- a) Intensive
 - b) **Extensive**
10. Volume, mass are examples of
- a) **Extensive thermodynamic property**
 - b) Intensive thermodynamic property
 - c) Both
 - d) None
11. Density and pressure are examples of
- a) Extensive thermodynamic property
 - b) **Intensive thermodynamic property**
 - c) Both
 - d) None

12. Values given to the thermodynamic property of an equilibrium state of thermodynamic system is called.

- a) Phase
- b) State function
- c) Intensive property
- d) extensive property

13. Heat and work are not state functions. This statement is...

- a) **True**
- b) False

14. The pressure force always acts on a surface in a direction ----- or normal to the surface.

- a) Parallel
- b) **Perpendicular**
- c) Horizontal
- d) Vertical

15. 1atm = -----

- a) 101.325 kpa
- b) 1001.326 kpa
- c) 100 kpa
- d) 99.34 kpa

16. The standard C-12 is used since

- a) **1961**
- b) 1981
- c) 1982
- d) 1962

17. Avogadro's number of ^{12}C atoms has a mass of

- a) 6.02×10^{23}
- b) **12 g**
- c) 10 g
- d) 6.02 g

18. The average mass of an atom is called

- a) **Atomic mass**
- b) Molecular mass
- c) Avogadro's number
- d) Molecular weight

19. The average mass of a molecule is called

- a) Atomic mass
- b) **Molecular mass**
- c) Avogadro's number
- d) Molecular weight

20. The mass per mole of a pure substance is called

- a) Atomic mass
- b) Molecular mass
- c) **Molar mass**
- d) Avogadro's number

21. Molar mass is expressed in

- a) **g/mol**
- b) Gram-mol
- c) g/mol²
- d) None

22. When we do calculations we assume that our gases are behaving as

- a) Real gases
- b) **Ideal gases**

23. Who is considered the father of chemistry

- a) **Robert Boyle**
- b) Jacques Charles

24. If the pressure = 0 then Boyles law hold for it

- a) True
- b) **False**

25. Boyles law holds for

- a) **Real gases**
- b) Ideal gases
- c) Both
- d) None

26. Relation between n and V is shown by

- a) Charles law
- b) **Avogadro's hypothesis**
- c) Boyle's law
- d) None

27. The energy change associated with a chemical reaction is called

- a) Internal energy
- b) **Enthalpy**
- c) Heat
- d) Work

28. $\Delta S_{\text{universe}} = \Delta S_{\text{system}} + \Delta S_{\text{surroundings}} > 0$ this equation show a

- a) **Spontaneous process**
- b) Equilibrium process
- c) Both
- d) None

29. Entropy of a perfect crystalline substance is zero at absolute zero defines

- a) 1st law of thermodynamics
- b) 2nd law of thermodynamics
- c) **3rd law of thermodynamics**
- d) 0th law of thermodynamics

30. What is the importance of third law?

- a) Allows to measure absolute temperature
- b) **Allows to measure absolute entropies**
- c) Allows to measure absolute pressure
- d) Allows to measure absolute volume

31. Entropy is measures in

- a) **J/K**
- b) J/mol
- c) JK
- d) All

32. Third law is helpful in measuring chemical affinity. Because of this it is known as

- a) **Nernst theorem**
- b) Phase equilibrium
- c) None

33. Enthalpy is measured in

- a) J/K
- b) J/mol
- c) KJ
- d) All

1. The quantitative study and measurement of heat and enthalpy changes is known as

- a) Thermodynamics
- b) **Thermochemistry**
- c) Analytical chemistry
- d) All

2. Enthalpy is a state function when

- a) Pressure is not constant
- b) Volume is constant
- c) **Pressure is constant**
- d) Volume is not constant

3. Thermochemical equation tells about the changes that take place in terms of

- a) Formulas
- b) Physical states
- c) **Both**
- d) None

4. What is the normal enthalpy of vaporization water

- a) **40.7 kJ / mol**
- b) -40.7kJ/mol
- c) 41.7 kJ/mol
- d) 42 kJ/mol

5. In the case of dissolved substances, the standard state of a solute is that in which the "effective concentration", known as the-----, is -----

- a) Negativity , 1
- b) Positivity , 2
- c) **Activity , unity**
- d) None

6. The heat associated with the formation of one mole of the compound from its elements in their standard states.

- a) **Enthalpy of formation**
- b) Enthalpy of vaporization
- c) Enthalpy of combustion
- d) Enthalpy

7. Enthalpy of formation of water is

- a) 286 kJ/mol
- b) **-286kJ/mol**
- c) 280kJ/mol
- d) 268kJ/mol

8. The thermochemical equation defining H_f° is always written in terms of ----- of the substance.

- a) Two moles
- b) Three moles
- c) Four moles
- d) **One mole**

9. The standard enthalpy of formation of gaseous atoms from the element is known as ----- .

- a) Heat of combustion
- b) Heat of formation
- c) **Heat of atomization**
- d) Heat of vaporization

10. The standard enthalpy of formation of an ion dissolved in water is expressed on a separate scale in which that of $H^+(aq)$ is defined as

- a) **Zero**
- b) One
- c) Two
- d) Three

11. Henri Hess discovered his law in

- a) 1850
- b) 1830
- c) 1880
- d) **1840**

12. Hess's law state that

- a) Enthalpy of a given chemical reaction is not constant
- b) **Enthalpy of a given chemical reaction is constant**
- c) Enthalpy of a given chemical reaction is variable.
- d) All statements are true

13. $\text{C}(\text{graphite}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) \quad \Delta H^\circ = -(\quad) \text{ kJ mol}^{-1}$
- a) **-393.51**
 - b) 393.51
 - c) 390.51
 - d) -395.40
14. $\text{C}(\text{diamond}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) \quad \Delta H^\circ = -(\quad) \text{ kJ mol}^{-1}$
- a) -393.51
 - b) 393.51
 - c) 390.51
 - d) **-395.40**
15. $\text{C}(\text{graphite}) \rightarrow \text{C}(\text{diamond}) \quad \Delta H^\circ = (\quad) \text{ kJ mol}^{-1}$
- a) -393.51
 - b) 393.51
 - c) **1.89**
 - d) -395.40
16. $q = \Delta H^\circ$ when both reactants and products have same
- a) **Temperature**
 - b) Pressure
 - c) Volume
 - d) Option b and c
17. The specific heat capacity of water (----- $\text{J g}^{-1} \text{K}^{-1}$)
- a) **4.184**
 - b) 5.184
 - c) 6.184
 - d) 3.184
18. Combustion takes place in bomb calorimeter at
- a) 1 atm
 - b) 2 atm
 - c) 3 atm
 - d) 4 atm
19. In bomb calorimeter volume is
- a) **Constant**
 - b) Variable
 - c) Change with time
 - d) Not observed

20. **Bomb calorimeter is used to determine the**
- a) Heat capacity
 - b) **Heat of combustion**
 - c) Heat of formation
 - d) Enthalpy
21. **Ice calorimeter is used to determine**
- a) **Heat capacity**
 - b) Heat of combustion
 - c) Heat of formation
 - d) Enthalpy
22. **In ice calorimeter volume is**
- a) Not Constant
 - b) **Variable**
 - c) Change with time
 - d) Not observed
23. **Expressed in units of thermal energy per degree temperature.**
- a) **Heat capacity**
 - b) Heat of formation
 - c) Enthalpy
24. **Amount of heat needed to raise the system's temperature by one degree is called a) Heat of fusion**
- b) Heat of formation
 - c) Enthalpy
 - d) **Heat capacity**
25. **$q = \Delta T \times C \times m$ this equation expresses the**
- a) Enthalpy
 - b) Heat
 - c) **Quantity of heat**
26. **In latent heat of vaporization temperature**
- a) Changes
 - b) **Does not change**
 - c) Sometimes change
27. **In latent heat of fusion temperature**
- a) Changes
 - b) **Does not change**
 - c) Sometimes change

28. **28. Substances change from solid to liquid and liquid to solid in**
- a) specific latent heat of vaporization
 - b) **specific latent heat of fusion**
 - c) Both
 - d) None
29. **29. Substances change from gas to liquid and liquid to gas in**
- a) **specific latent heat of vaporization**
 - b) specific latent heat of fusion
 - c) Both
 - d) None
30. **30. Throttling is a ----- process**
- a) Reversible
 - b) **Irreversible**
 - c) Both
31. **31. Mechanical friction occurring during a process due to some external source.**
- a) External reversibility
 - b) Internal irreversibility
 - c) **External irreversibility**
 - d) Internal reversibility
32. **32. Unrestricted expansion of gas, viscosity and inertia of the gas.**
- a) External reversibility
 - b) **Internal irreversibility**
 - c) External irreversibility
 - d) Internal reversibility
33. **33. Release of free energy from the system corresponds to a negative change in free energy, but to a positive change for the ----- in spontaneous change .**
- a) **Surroundings**
 - b) System
 - c) Free energy
 - d) Reaction
34. **34. If a sufficiently large number of individual interactions are involved, then the direction will always be in the direction of---**
- a) Decreased enthalpy
 - b) **Increased entropy**
 - c) Both
 - d) None

35. 35. The rate of reaction in spontaneous process depends on

- a) Spontaneity
- b) **Chemical kinetics**
- c) Stability
- d) All of them

1. A spontaneous process is non spontaneous in the ----- direction

- a) Forward
- b) **Reverse**
- c) In between
- d) Both a and b

2. In endergonic reaction the standard change in free energy is ----- and energy is ----- .

- a) **Positive , absorbed**
- b) Negative, released
- c) Negative , absorbed
- d) positive ,released

3. The total amount of energy of non spontaneous reaction is

- a) Positive
- b) At equilibrium
- c) **Negative**
- d) None

4. In which state of reaction there is no net change over time ?

- a) Reversible reaction
- b) Spontaneous reaction
- c) **At equilibrium**
- d) Forward reaction

5. The equilibrium constant is used to determine the----- of each compound that present at equilibrium.

- a) **Amount**
- b) Units
- c) Rate
- d) Energy

6. Kc changes with temperature. This is ----

- a) **True**
- b) False

7. **K_c is written**

- a) With units
- b) **Without units**
- c) None

8. **If $K < 1$ then it favors**

- a) **Reactants**
- b) Products
- c) Will be at equilibrium
- d) None

9. **If $Q > K_c$ then which reaction will occur**

- a) Forward
- b) **Reverse**

10. **If $Q < K_c$ then which reaction will occur**

- a) **Forward**
- b) Reverse

11. **If ΔG is negative then the reaction will be**

- a) Non spontaneous
- b) **Spontaneous**
- c) Both

12. **If ΔG is negative then**

- a) K would be very small
- b) **K would be very large**
- c) Both

13. **If ΔG is positive then the reaction will be**

- a) **Non spontaneous**
- b) Spontaneous
- c) Both

14. **At standard conditions activities of all reactants and products is not equal to unity .**

- a) **True**
- b) False

15. **If ΔG is positive then the----- reaction will be spontaneous.**

- a) **Reverse**
- b) Forward
- c) Equilibrium

16. The Gibbs-Helmholtz equation provides information about the ----- dependence of the Gibbs free energy.
- a) Pressure
 - b) Volume
 - c) **Temperature**
17. Activity is more accurate in more ---- solutions
- a) Dilute
 - b) **Concentrated**
 - c) Mix
 - d) All of above
18. Fugacity is the measure of
- a) Ideality of liquid
 - b) Non ideality of solutions
 - c) **Non ideality of gases**
 - d) Ideality of gases
19. Determines the real chemical potential for a real solution rather than an ideal one.
- a) Fugacity
 - b) **Activity**
 - c) Ideality
 - d) Non ideality
20. ----- can be used to calculate equilibrium constants and reaction rates.
- a) Activity
 - b) Concentration
 - c) **Both**
 - d) None
21. Dealing with more concentrated solutions, the difference in the observed concentration and the calculated concentration in equilibrium -----.
- a) Remains constant
 - b) Decreases
 - c) **Increases**
 - d) Becomes diluted
1. Measure of the relative amounts of products and reactants present in a reaction at a given time.
- a) Reaction concentration
 - b) **Reaction quotient**
 - c) Equilibrium constant
 - d) All of above

2. **Q can be calculated when the reaction is at**
- a) Equilibrium
 - b) Not at equilibrium
 - c) **Both**
 - d) None
3. **Q>K, this suggests that we have more-----present than we would have at equilibrium.**
- a) Reactants
 - b) **Products**
4. **Q>K, this will favors the**
- a) Forward reaction
 - b) **Reverse reaction**
 - c) Equilibrium reaction
 - d) None
5. **Determine how the equilibrium constant for a reaction or process will vary with temperature.**
- a) **Van't Hoff equation**
 - b) Gibbs free energy
 - c) Henry's law
 - d) Le Chatelier's principle
6. **At constant pressure, a plot with $\ln K_{eq}$ on the y-axis and $1/T$ on x-axis has a slope given by. **
- a) $\Delta H / R$
 - b) H / R
 - c) $-\Delta R / H$
 - d) **$-\Delta H / R$**
7. **What is considered the origin of Le Chatelier's principle?**
- a) **Van't Hoff equation**
 - b) Gibbs free energy
 - c) Henry's law
1. **For an endothermic reaction, the slope $-\Delta H / R$ is negative and so as the temperature ----- the equilibrium constant -----.**
- a) Increases, decreases
 - b) Decreases, increases
 - c) **Increases, increases**
 - d) Decreases, decreases

2. For an exothermic reaction, the slope $-\Delta H / R$ is ----- and so as temperature increases, the equilibrium constant -----
 - a) Negative, decreases
 - b) **Positive, decreases**
 - c) Positive, increases
 - d) Negative, increases
3. The van't Hoff equation provides information about the ----- dependence of the equilibrium constant.
 - a) Pressure
 - b) **Temperature**
 - c) Volume
4. Gibbs-Helmholtz equation, which gives the temperature dependence of the -----
 - a) **Gibbs free energy**
 - b) Equilibrium constant
 - c) Both
 - d) Temperature
5. Principle which states that any change to a system at equilibrium will adjust to compensate for that change.
 - a) **Le Châtelier's**
 - b) Henry's law
 - c) Van't Hoff equation
 - d) None
6. When did the principle of Le Châtelier's principle was given ?
 - a) 1886
 - b) **1884**
 - c) 1889
 - d) 1880
7. Le Châtelier's principle gives the explanation for the changes at molecular level?
 - a) Yes
 - b) **No**
8. If there is an increase in products, the reaction quotient, Q_c is ----- making it ----- than the equilibrium constant, K_c .
 - a) **Increased, greater**
 - b) Decreased, smaller
 - c) Increased, smaller

9. If pressure is decreased at left hand side of the reaction then the reaction will be
a) **Reverse**
b) Forward
c) Equilibrium
10. If Q_c is greater than K_c the reaction will be
a) **Reversed**
b) Forward
c) Equilibrium
11. Adding an inert gas into a gas-phase equilibrium at constant volume result in a shift.
a) True
b) **False**
12. By adding an inert gas the total pressure of the system
a) **increases**
b) decreases
c) stay at equilibrium
13. When the volume of a mixture is reduced, a net change occurs in the direction that produces --- moles of gas
a) more
b) **fewer**
c) less
d) no gas
14. When volume is increased the change occurs in the direction that produces more moles of gas.
a) **more**
b) fewer
c) less
d) no gas
15. if the temperature of exothermic reaction is increased then it will move to left to ----- the extra heat
a) release
b) **absorb**
c) extract
d) emit
16. if we want to increase the amount of product by increasing the temperature in an exothermic reaction then
a) it is possible
b) it is not possible
c) it is a wrong approach

17. Decreasing the temperature favors ----- in a reversible reaction at equilibrium.
- a) endothermic reaction
 - b) **exothermic reaction**
18. Liquids are more dense and less compressible than
- a) Solids
 - b) Liquids
 - c) **Gases**
 - d) Air
19. Intermolecular forces (non-covalent bonds) influence the ----- properties of liquids.
- a) **Physical**
 - b) Chemical
 - c) Both
20. Gases have a low density and are --- compressible.
- a) Less
 - b) **Highly**
 - c) Lightly
21. In liquids are in constant motion, and their kinetic energy depends on their ----.
- a) Pressure
 - b) Density
 - c) Volume
 - d) **Temperature**
22. The energy required to increase the surface area of a liquid by a unit amount.
- a) **Surface tension**
 - b) Viscosity
 - c) Cohesive forces
 - d) All
23. The magnitude of the force that controls the shape of the liquid is called
- a) **Surface tension**
 - b) Viscosity
 - c) Cohesive forces
 - d) All
24. A molecule at the surface of a liquid experiences
- a) **Net inward cohesive forces.**
 - b) Net outward cohesive forces.
 - c) Both
 - d) None

25. The energy state of the molecules on the interior is ---- than that of the molecules on the exterior.

- a) Greater
- b) **Lower**
- c) High
- d) Less

26. ----- is also often referred as the thickness of a fluid.

- a) Tension
- b) **Viscosity**
- c) Refractive index

27. The ---- is a ratio of the speed of light in a medium relative to its speed in a vacuum.

- a) Tension
- b) Viscosity
- c) **Refractive index**

28. The factors which affect the value of the refractive index

- a) Temperature
- b) Wavelength of light
- c) **Both**
- d) none

29. The speed of light changes in other medium because the atom of other medium--- the light particles.

- a) Absorb
- b) Reemit
- c) **Both a and b**
- d) Reflect

30. At ---- temperature the liquid becomes less dense and less viscous, causing light to travel faster in the medium.

- a) **High**
- b) Low
- c) Room temperature
- d) All of above

31. At the high temperature the value for the refractive index of liquid is

- a) Large
- b) **Small**
- c) Very small
- d) Very high

32. The refractive index varies with wavelength

- a) Inversely
- b) **Linearly**
- c) Transversely

33. It is important to use ----- light to prevent dispersion of light into different colors.

- a) Dichromatic
- b) Trichromatic
- c) **Monochromatic**

34. The sodium D line at ---- is the most frequently used wavelength of light for a refractometer.

- a) **598 nm**
- b) 589 nm
- c) 550 nm
- d) 560 nm

35. ----- is the measure of net molecular polarity.

- a) Dipole attraction
- b) **Dipole moment (μ)**
- c) Ionic interaction
- d) Covalent bond

36. Dipole moments tell us about the ----- in a molecule.

- a) **Charge separation**
- b) Charge interaction
- c) Charges
- d) All

37. ---- is non polar molecule

- a) Carbon
- b) Oxygen
- c) **Carbon dioxide**
- d) Water

38. The biggest impact dipole interactions have on living organisms is seen with?

- a) **Protein folding.**
- b) Glucose formation
- c) Energy formation
- d) All

39. ---- % of our bodies being water.

- a) 60%
- b) **65%**
- c) 80%
- d) 70%

40. Besides mercury, ---- has the highest surface tension for all liquids.

- a) **Water**
- b) Liquid nitrogen
- c) Carbon dioxide
- d) hydronium

41. Water's high surface tension is due to the ---- in water molecules.

- a) Covalent bonds
- b) **Hydrogen bonding**
- c) Molecular interactions
- d) all

42. Vaporization is ----- reaction.

- a) Exothermic reaction
- b) **Endothermic reaction**
- c) Both
- d) None

43. Water's heat of vaporization is----.

- a) **41 kJ/mol**
- b) 42 kJ/mol
- c) 43 kJ/mol
- d) 44 kJ/mol

44. Vapor pressure is----- related to intermolecular forces.

- a) Directly
- b) **Inversely**
- c) Not related
- d) None

45. Liquids with stronger intermolecular interactions are usually ---- viscous than liquids with weak intermolecular interactions.

- a) **More**
- b) Less

46. Cohesion is intermolecular forces between --- molecules.

- a) **Like**
- b) Unlike
- c) Both

47. In the form of ice the volume of water increases about --- .

- a) 19%
- b) 18%
- c) 10%
- d) **9%**

48. It is very rare to find a compound that lacks ----- to be a liquid at standard temperatures and pressures.

- a) **Carbon**
- b) Nitrogen
- c) Oxygen
- d) Hydrogen

49. Chemist Jacobus van't Hoff was the first to describe

- a) Colligative properties
- b) **Anomalous colligative properties**
- c) Both

50. Who succeeded in explaining anomalous values of colligative properties

- a) **Svante Arrhenius**
- b) Jacobus van't Hoff

51. The solutions which obey Raoult's law at all compositions of solute in solvent at all temperature are called ---- .

- a) **Ideal solution**
- b) Non ideal solution
- c) Both

52. An ideal solution or ideal mixture is a solution in which the enthalpy of solution is

- a) **Zero**
- b) Non zero
- c) One

53. The enthalpy ideal solution is zero, the change in Gibbs energy on mixing is determined solely by the ---- of mixing.

- a) Enthalpy
- b) Free energy
- c) **Entropy**

54. Ethyl chloride and ethyl bromide n-hexane and n-heptane CCl_4 and SiCl_4 these are examples of

- a) **Ideal solutions**
- b) Non ideal solutions
- c) both
- d) none

55. It has been found that on increasing ---- , a non-ideal solution tend to be ideal.

- a) Concentration
- b) **Dilution**
- c) Solute particles

56. When a substance is dissolved in a solution, the vapor pressure of the solution will generally ----.

- a) Increase
- b) Remains constant
- c) **Decreases**

57. The decrease in vapor pressure of ideal solution will be greater than that calculated by Raoult's Law for.

- a) **Dilute solutions**
- b) Concentrated
- c) Both
- d) None

58. Freezing point depression is directly proportional to

- a) Molarity of solute
- b) **Molality of the solute**
- c) Molality of solvent

59. The freezing points of solutions are --- than that of the pure solvent

- a) Higher
- b) **Lower**
- c) Equal to

60. Adding solutes to an ideal solution results in ---- in entropy

- a) Decrease
- b) No change
- c) **Increase**
- d) None

61. The maximum depression of the freezing point is about ----
- a) -17°C (0°F)
 - b) -19°C (0°F)
 - c) -18°C (0°F)
62. If the ambient temperature is high then NaCl will be effective. this statement is
- a) **True**
 - b) False
63. The boiling points of solutions are --- than that of the pure solvent
- a) **Higher**
 - b) Lower
 - c) Very low
 - d) Equal to
64. The determination of colligative properties allows us to determine
- a) concentration of a solution
 - b) molar masses of solutes
 - c) **both**
 - d) none
65. The osmotic pressure of a solution is proportional to the molar concentration of the ---- in solution.
- a) **solute particles**
 - b) solvent
 - c) molar concentration
66. Semipermeable membranes do not let the ---- pass through.
- a) **Solute**
 - b) Solvent
 - c) Both
 - d) Water
67. Henry's law is one of the gas laws formulated by William Henry in
- a) **1803**
 - b) 1809
 - c) 1888
 - d) 1880

68. "At a constant temperature, the amount of a given gas that dissolves in a given type and volume of liquid is directly proportional to the partial pressure of that gas in equilibrium with that liquid." it is

- a) **Henry's law**
- b) Van't hoff equation
- c) Stability law

69. The solubility of a gas in a liquid is directly proportional to the partial pressure of the gas above the liquid this is

- a) **Henry's law**
- b) Gas law
- c) Raoult's law

70. Positive non-ideal behavior of the vapor pressure of a solution follows Henry's Law at ----- and Raoult's Law at -----.

- a) **Low concentration, high concentration**
- b) High concentration, low concentration
- c) Both correct

71. Conditions of henry's law

- a) Works if the molecules are at equilibrium.
- b) Does not work for gases at high pressures
- c) Does not work if there is a chemical reaction between the solute and solvent
- d) **All of above**

72. Solution that generally contains ions, atoms or molecules that have lost or gained electrons, and is electrically conductive.

- a) **Electrolyte solutions**
- b) Ideal solutions
- c) Ionic solutions

73. To form a compound

- a) ion-dipole forces < interionic bonds
- b) **ion-dipole forces > interionic bonds**
- c) ion-dipole forces = interionic bonds

the ionic compound is.

- a) **E**
- b) **E**

ndothermic

xothermic

74. Breaking apart

75. Hydrating cation and anion is.
- a) Endothermic
 - b) Exothermic
76. The ---- depends on the intermolecular forces of the solute and solvent.
- a) **Enthalpy of solution**
 - b) Entropy of solution
 - c) Both
77. Most versions of the equilibrium constant K utilizes ---- so that the units would disappear more fluently.
- a) Concentration instead of activity
 - b) **Activity instead of concentration**
78. For an ideal solution, the activity coefficient is 1 [x]/ o Celcius, thus when the concentration is dived by it to yield activity, it is ----.
- a) **Not changed**
 - b) Altered
 - c) Changed
79. This theory was discovered due to Arrhenius's theory having deficiencies.
- a) Ionic theory
 - b) Atomic theory
 - c) **Interionic Attractions**
80. The theory of electrolyte solution was brought about by Peter Debye and Erich Huckel in.
- a) **1923**
 - b) 1992
 - c) 1997
 - d) 1925