

Arts, Commerce and Science College, Bodwad.

Multiple Choice Question Bank

T.Y. B.Sc. Sem-V

Subject: - PHYSICAL CHEMISTRY (Chemistry)

1] de-Broglie wave can be explain

A) Schrodinger wave equation

B) Bohr novel postulate

C) Rutherford's experiment

D) Non of these

2] Which of the following phenomenon Classical mechanics fails to explain,

A) Black body radiation

B) Heat capacities

C) Atomic spectra

D) All of these

3] The order of reaction is

A) Theoretical property

B) Physical property

C) Experimental property

D) Extensive property

4] Half life period of first order is.....initial concentration.

A) dependent

B) independent

C) inversely related to

D) directly proportional to

5] Thermal decomposition of azoisopropane is example of.....order reaction.

A) Zero

B) First

C) Second

D) Third

6] In pseudo molecular reaction order and molecularity are....

A) different

B) same

C) inverse of each other

D) independent on each other

7] According to Arrhenius theory rate of reaction is proportional to.....

A) Concentration of product

B) Concentration of catalyst

C) Concentration of activated complex

D) None of these

8] In kinetic study in the reaction mix ice is added because.....

A) It increase the rate

B) It maintain the temperature of reactant

C) It arrest the reaction at that instant

D) It decrease the catalyst concentration

9] Arrhenius equation is very important equation in kinetics to calculate.....

A) Energy of activation

B) Heat of reaction

C) Free energy

D) Entropy of reaction

10] In photo electric emission, the energy of emitted electron is

A) Smaller than incident photon

B) Same as that of the incident photon

C) Greater than incident photon

D) Proportional to the intensity of incident photon

11] According to de-Broglie equation, the momentum of a particle in motion isproportional to wavelength.

A) inversely

B) Directly

C) is not

D) non of these

12] It is impossible to determine simultaneously the position and velocity with accuracy of a small particle like electron. This statement is

A) Heisenberg's uncertainty principle

B) de-Broglie principle

C) Planck's law

D) Aufbau's principle

13] According to Heisenberg uncertainty principle

A) position and momentum can't measured simultaneously

B) electron can't reside in the nucleus

C) molecules oscillate with some minimum energy at room temperature

D) All of these

14] Wave function is set to be well behaved when it

A) has finite value

B) quadratically integrable

C) Continuous and differentiable

D) All of these

15] If only one molecule takes part, it is calledreaction.

A) bimolecular

B) unimolecular

C) termolecular

D) Non of these

16] The molecularity of reaction is.....

A) Theoretical property

B) Physical property

C) Experimental property

D) Extensive propert

17] Half life period of second order is..... on first power of initial concentration.

A) depend inversely

B) independent

C) inversely related to

D) directly proportional to

18] Thermal decomposition of Acetaldehyde is example oforder reaction.

A) Zero

B) First

C) Second

D) Third

19] Hydrolysis of methyl acetate is example oforder reaction.

A) Zero

B) First

C) Second

D) Third

20] The reaction in which rate of reaction is.....on concentration of all reactants is known as zero order reaction.

A) independent

B) dependent

C) inversely related to

D) directly proportional to

21] The reaction in which rate of reaction is independent on concentration of all reactants is known asorder reaction.

A) Zero

B) First

C) Second

D) Third

22] Who proposed the theory of energy of activation.

A) Arrhenius

B) Van't Hoff

C) Eyring

D) Evan

23] The collision theory was proposed by

A) Eyring and Evan

B) Arrhenius and Van't Hoff

C) Eyring and Polanyi

D) Evan and Polanyi

24] The activated complex theory was proposed by

A) Eyring

B) Polanyi

C) Evan

D) All of these

25] The rate of reaction depends on

A) Temperature

B) Pressure

C) Concentration

D) Non of these

26] By increasing the temperature through 10degree C the rate becomes...

A) twice or thrice

B) same

C) zero

D) non of these

27] This method is also called as equifraction or equi-portion method.

A) Integrated rate equation method

B) Graphical method

C) Differential method

D) Half life method

28] In the integrated rate equation method if the values of k_1 comes out to be constant, then it isorder reaction.

A) Zero

B) First

C) Second

D) Third

29] In the integrated rate equation method if the values of k_2 comes out to be constant, then it is....order reaction.

A) Zero

B) First

C) Second

D) Third

30] The rate of reaction is directly proportional to zero power of concentration of the reactants, is known as....order reaction.

A) Zero

B) First

C) Second

D) Third

31] The reactions whose order and molecularity are not same are called as....reactions.

A) zero order

B) first order

C) second order

D) pseudomolecular

32] The reaction in which the rate of reaction depends on the second power of concentration of a reactant in rate law then the reaction is known asorder reaction.

A) Zero

B) First

C) Second

D) Third

33] If power supply is connected to the cell with its negative side attached to the working electrode, electrons starts flowing from electrode to solution this flow is called as

A) oxidation voltage

B) reduction voltage

C) oxidation current

D) reduction current

34] If power supply is connected to the cell with its positive side attached to the working electrode, electrons starts flowing from electrode to solution this flow is called as....

A) oxidation voltage

B) reduction voltage

C) oxidation current

D) reduction current

35] These processes are governed by Faraday's law hence are called as....

A) Faradaic Processes

B) Non-Faradaic processes

C) Non- Faraday Processes

D) Faraday Processes

36] The electrical double layer consist of

A) Inner Helmholtz layer

B) Outer Helmholtz layer

C) Diffuse layer

D) All of these

37] In the layer closest to electrode surface, the locus of electrical centres is called as.....

A) Inner Helmholtz layer

B) Outer Helmholtz layer

C) Diffuse layer

D) All of these

38] In the electrical double layer, the solvated ions are distributed from OHP to bulk of solution, this region is called as.....

A) Helmholtz layer

B) Stern layer

C) Diffuse layer

D) All of these

39] Liquid junction potential arises due to.....

A) Diffusion of electrolyte

B) Presence of porous partition

C) Different velocities of ions

D) All of these

40] How many types of liquid junction potential.....

A) 1

B) 3

C) 2

41] Potential of cell with transference is given by.....

A) $E_{\text{cell}} = E_1 + E_2 + E_j$

B) $E_{\text{cell}} = E_1 - E_2 + E_j$

C) $E_{\text{cell}} = E_1 - E_2 - E_j$

D) $E_{\text{cell}} = E_1 + E_2 - E_j$

42] Liquid junction potential can be minimized by using

A) Porous partition

B) Salt bridge

C) Semi permeable membranr

D) None of these

43] Chemical cell without transference is a combination of.....

A) electrode reversible to cation and metal insoluble salt electrode

B) two electrodes reversible to cations

C) two electrodes reversible to anions

D) none oh these

44] Chemical cell with transference is a combination of....

A) Two metal ion electrodes reversible to cation

B) Two metal insoluble salt electrodes reversible to cations

C) Two electrodes reversible to anions

D) Non of these

45] p^{H} solution is defined as

A) $p^{\text{H}} = -\log_{10} 1/a_{\text{H}^+}$

B) $P^{\text{H}} = -\log a_{\text{H}^+}$

C) $p^{\text{H}} = \log a_{\text{H}^+}$

D) None of these

46] When the hydrogen gas electrode is combine with saturated calomel then P^{H} of solution is determined by using equation

A) $P^{\text{H}} = E_{\text{cell}} - 0.242$

B) $P^{\text{H}} = E_{\text{cell}} + 0.242/0.0591$

C) $P^{\text{H}} = E_{\text{cell}} - 0.242/0.0591$

D) None of these

47] When the quinhydrone electrode is combine with saturated calomel electrode then P^{H} of solution is determined by using equation.

A) $P^H = 0.4574 - E_{\text{cell}}/0.0591$

B) $P^H = -0.4574 - E_{\text{cell}}/0.0591$

C) $P^H = 0.4574 + E_{\text{cell}}/0.0591$

D) None of these

48] Which of the following are advantages of Quinhydrone electrode.

A) It can be set up easily

B) Its temperature coefficient is also very low.

C) It can attain equilibrium very quickly.

D) All of these

49] Which of the following are advantages of Glass electrode.

A) It attains equilibrium very quickly.

B) It can be used in presence of oxidizing and reducing agent.

C) It can also be used in case of colloidal or hybrid solution.

D) All of these

50] Which of the following are limitations of Glass electrode.

A) The Glass electrode draws some amount of current hence cannot be used for P^H measurement.

B) Glass electrode made of acid resisting material used only for P^H range between 1 to 9.

C) It cannot be used for alkaline solution having P^H range 9 to 14.

D) All of these

51) Which factor affects the rate of reaction.

A) Temperature

B) Particle size

C) Catalyst

D) All of these

52] Order is equal to molecularity for.....reactions.

A) elementary

B) Complex

C) Both A and B

D) Non of these

53] Order can be zero or.....

A) fractional

B) integer

C) Both A and B

D) Non of these

54] Which term gives information about the rate of reaction.

A) Molecularity

B) Order

C) Both A and B

D) Non of these

55] What is the unit of k in first order reaction.

A) sec^{-1} or min^{-1}

B) $\text{lit mole}^{-1} \text{ s}^{-1}$ or $\text{lit mole}^{-1} \text{ min}^{-1}$

C) mole^{-1}

D) Non of these

56] What is the unit of k in second order reaction.

A) sec^{-1} or min^{-1}

B) $\text{lit mole}^{-1} \text{ s}^{-1}$ or $\text{lit mole}^{-1} \text{ min}^{-1}$

C) mole^{-1}

D) Non of these

57] The reaction between potassium persulphate and potassium iodide is the example of....order reaction.

A) zero

B) first

C) second

D) third

58] Fractional change method is also called as ...

A) Half life method

B) equifraction

C) equo-portion

D) All the above

59] In collision theory 'P' is called as

A) Plank's Constant

B) Steric factor

C) Probability factor

D) Both B and C

60] The value of 'P' varies from..

A) 1 to 10^{-7}

B) 1 to 10^{-8}

C) 1 to 10^{-9}

D) 1 to 10^{-6}

61] The collision theory is applicable to.....

A) Simple gaseous reaction

B) Complicated

C) Both A and B

D) Non of these

62] In collision theory 'd' is denoted as...

A) Reduce mass

B) Collision diameter

C) No. of molecules

D) Non of these

63) Rate law is also called as ...

A) Rate constant

B) Velocity constant

C) Both A and B

D) Non of these

64] The constant k is called....

A) rate constant

B) velocity constant

C) velocity coefficient

D) All the above

65] The negative sign in rate $-dc/dt$ indicates that concentrationas time

A) increases, decreases

B) decreases, increases

C) increases, increases

d) decreases, decreases

66] The positive sign in rate $+dc/dt$ indicates that concentration.....as time.....

A) increases, decreases

B) decreases, increases

C) increases, increases

D) decreases, decreases

67] If the graph of $\log(a-x)$ versus 't' is straight line having negative slope then the reaction is....order.

A) Zero

B) First

C) Second

D) Third

68] If the graph is not straight line the graph of $1/a-x$ against 't' is.....order.

A) Zero

B) First

C) Second

D) Third

69] In the second order reaction half life period is....

A) $t_{1/2} = 0.693/k_1$

B) $t_{1/2} = 1/ak_2$

C) $t_{1/2} = 1/a^{n-1}$

D) Non of these

70] In the first order reaction half period is...

A) $t_{1/2} = 0.693/k_1$

B) $t_{1/2} = 1/ak_2$

C) $t_{1/2} = 1/a^{n-1}$

D) Non of these

71] Half life period of second order reaction is directly proportional to

A) $1/a$

B) $1/a^2$

C) a^2

D) $a^{1/2}$

72] The nature of graph of $(1/a-x)$ verses time is straight line indicates the reaction is

A) Zero order

B) First order

C) Second order

D) Third order

73] How many Planck modifications to the classical theory.

A) 1

B) 2

C) 3

D) 4

74] Who proposed an empirical formula to represent the high and low part of the emission spectrum.

A) Eyring

B) Einstein

C) Van't Hoff

D) Max Planck

75] The scattering of photon by an electron is called the....

A) Compton effect

B) Photoelectric effect

C) Compton scattering

D) Non of these

76] The phase rule was first discovered by.....

A) Nernst

B) Gibbs

C) Arrhenius

D) Le chatelier

77] Mathematically, the phase rule can be expressed by

A) $F + P = C + 2$

B) $F = C - P + 2$

C) $P = C - F + 2$

D) All of these

78) A system containing liquid water and water vapour has the number of phase equal to

A) 0

B) 1

C) 2

D) 3

79] A mixture of three gases O_2 , N_2 and CO_2 is.....

A) 1- phase system

B) 2- phase system

C) 3- phase system

D) 4- phase system

80] A mixture of two immiscible liquids constitutes a systems having the number of phases equal to.....

A) zero

B) one

C) two

D) three

81] Water system has three phases –ice, water nad vapours. The number of components in the system is.....

A) one

B) two

C) three

D) four

82] A mixture of gases O_2 and N_2 constitutes on phase only. The number of components in the system is....

a) zero

B) one

C) two

D) three

83] The total number of variable factors which must be specified so that the remaining variables are fixed automatically and the system is completely defined. It is known as.....

A) a phase

B) a component

C) degree of freedom

D) none of these

84] For a pure gas and mixture of gases, the degrees of freedom are...

A) 2 and 2

B) 2 and 3

C) 3 and 2

D) 3 and 3

85] For one component system the phase rule is.....

A) $F = 3 - P$

B) $F = 2 - P$

C) $F = 1 - P$

D) Non of these

86] At a triple point.....

A) both the temperature and pressure are fixed

B) only the temperature is fixed

C) only the pressure is fixed

D) sometimes pressure and sometime temperature is fixed

87] For one phase and one component system, the degrees of freedom are equal to...

A) 1

B) 2

C) 3

D) 4

88] When a single phase is present in a two component system, the degree of freedom is ...

A) zero

B) one

C) two

D) three

89] A system with zero-degree of freedom is known as....

A) monovariant

B) bivariant

C) invariant

D) none of these

90] For a three phase system with one component, the degree of freedom according to phase rule is

A) 0

B) 1

C) 2

D) 3

91] Which of the following advantages of phase rule.

A) It is applicable to both chemical and physical equilibria.

B) It is applicable to macroscopic systems and hence no information is required regarding molecular, micro structure.

C) We can conveniently classify equilibrium states in terms of phases, components and degree of freedom.

D) All the above

92] Which of the following limitations of phase rule.

A) It is applicable only for the system which are in equilibrium.

B) Under the same conditions of temperature and pressure, all the phases of the system must be present.

C) It considers only the number of phases, rather than their amounts.

D) All the above

93] Evaluate P, C and F for a mixture of gases enclosed in a cylinder.

A) 2

B) 3

C) 4

D) 5

94] The phase rule is applicable to

- A) homogenous systems
- B) reversible systems
- C) irreversible system

D) heterogeneous system

95] The sulphur system has four phases : rhombic, monoclinic, liquid and vapour sulphur. It is.....

- A) one- component system**
- B) two- component system
- C) three- component system
- D) four- component system

96] For a bivariant system, the degrees of freedom are....

- A) one
- B) two
- C) three**
- D) four

97] For a two component system in a single phase, the degree of freedom is

- A) zero
- B) one
- C) two
- D) three**

98] The reduced phase rule for a condensed system is....

- A) $F = C - P + 2$
- B) $F = C - P + 1$**
- C) $F = C - P$
- D) $F = C - P + 3$

99] In the Feric Chloride-Water system, the number of congruent melting point is

- A) four**
- B) one
- C) two
- D) three

100] In the Feric Chloride-Water system, the number of eutectic point is.....

A) Four

B) one

C) five

D) three