

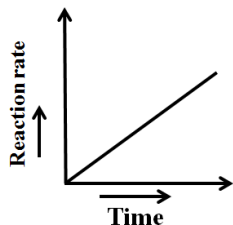
42. The distance between an object and its real image formed by a lens is 'D'. If the magnification is 'm', the focal length of the lens is
- 1) $\left[\frac{m-1}{m}\right]D$ 2) $\frac{mD}{m+1}$ 3) $\frac{(m-1)D}{m^2}$ 4) $\frac{mD}{(m+1)^2}$
43. When an object is placed between two plane mirrors, then the number of images formed is
- 1) 2 2) 4 3) 8 4) infinite
44. The monochromatic light beams of intensity 16 and 9 units are interfering. The ratio of intensities of bright and dark parts of the resultant pattern
- 1) 16/9 2) 49/1 3) 7/1 4) 4/3
45. In YDSE for producing interference pattern, the fringe width depends on
- a) wavelength b) distance between the two slits
 c) distance between screen and the slits d) distance between source and the slits
- 1) a only 2) a and b 3) a, b and c 4) a, b and d

CHEMISTRY

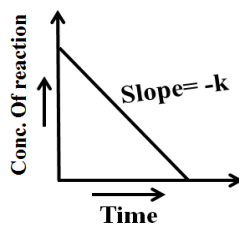
46. The maximum number of electrons that can be present in an orbital with $S = +\frac{1}{2}$ and $l = 2$
- 1) 1 2) 3 3) 5 4) 7
47. Which statement is wrong about Bohr's theory
- 1) Orbit is a three dimensional area where probability of finding electron is maximum
 2) Orbit is a two dimensional track on which electron moves
 3) Atom has definite boundary
 4) Energies and angular momentum of orbits are quantized
48. Give the name of the inert gas atom in which the total number of d-electrons is equal to the difference in numbers of total p & s - electrons
- 1) Ar 2) Kr 3) Xe 4) Rn
49. In which of the following pairs the two species are not isostructural?
- 1) CO_3^{2-} and NO_3^- 2) PCl_4^+ and $SiCl_4$ 3) PF_5 and BrF_5 4) AlF_6^{3-} and SF_6
50. What is the dominant intermolecular force or bond that must be overcome in converting liquid CH_3OH to a gas?
- 1) Covalent bonds 2) Dipole-dipole interaction
 3) London dispersion forces 4) Hydrogen bonding
51. Volume occupied by one molecule of water (density = 1gm cm^{-3})
- 1) $3.0 \times 10^{-23} \text{cm}^3$ 2) $5.5 \times 10^{-23} \text{cm}^3$ 3) $6.023 \times 10^{-23} \text{cm}^3$ 4) $9.0 \times 10^{-23} \text{cm}^3$
52. When N_2 is converted into NH_3 , the equivalent weight of nitrogen will be
- 1) 1.67 2) 2.67 3) 3.67 4) 4.67
53. Which is not a property of H_2O_2
- 1) Conc. H_2O_2 solution is acidic in nature 2) H_2O_2 is a planar molecule
 3) H_2O_2 is an excellent solvent for electrolysis 4) H_2O_2 is a diamagnetic
54. Read the following statements
- I) Cs^+ is highly hydrated
 II) Li has highest melting point among Li, Na, K & Rb
 III) In alkali metals only Li forms nitride
- The correct statements are
- 1) I & II 2) II & III 3) I & III 4) I, II & III
55. Solution of azeotropic nitric acid contain
- 1) 32% HNO_3 , 68% H_2O by mass 2) 50% HNO_3 , 50% H_2O by mass
 3) 68% HNO_3 , 32% H_2O by mass 4) 30% HNO_3 , 70% H_2O by mass

56. If NaCl is doped with 10^{-3} mole% , $SrCl_2$ then the concentration of cation vacancies will be
 1) 1×10^{-3} mole% 2) 2×10^{-3} mole% 3) 3×10^{-3} mole% 4) 12.04%
57. The pressure of H_2 required to make the potential of H_2 – electrode zero in pure water at 298K is
 1) 10^{-4} atm 2) 10^{-10} atm 3) 10^{-12} atm 4) 10^{-14} atm

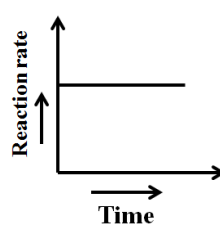
58. The correct curve for zero order reaction



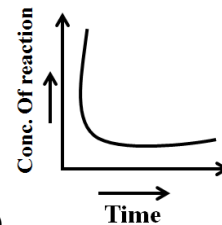
I)



II)



III)



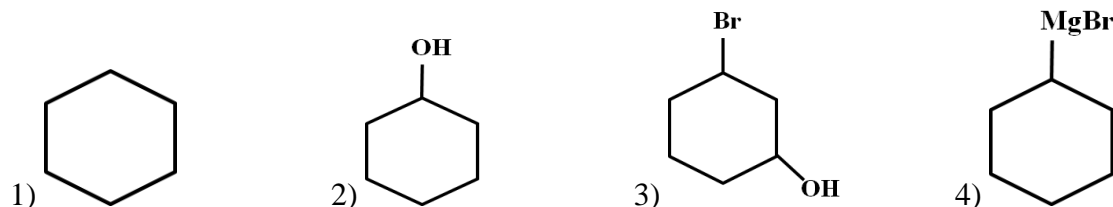
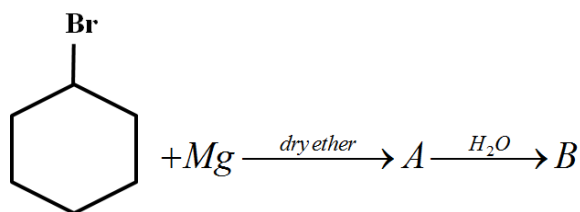
IV)

Choose the correct set of option from the following

- 1) I & II 2) II & III 3) I & III 4) II & IV
59. Which property of colloids is not dependent on the charge on colloidal particles?
 1) Coagulation 2) Electrophoresis 3) Electro osmosis 4) Tyndall effect
60. In PO_4^{3-} ion, the formal charge on each oxygen atom and P–O bond order respectively are
 1) -0.75, 1.0 2) -0.75, 0.6 3) -0.75, 1.25 4) -3, 1.25
61. Which of the following is used as fluorinating agent?
 1) SF_2 2) SF_4 3) SF_6 4) S_2Cl_2
62. Which has maximum P^H in aqueous solution
 1) $NaClO$ 2) $NaClO_2$ 3) $NaClO_3$ 4) $NaClO_4$
63. Match the items of Column-I and Column-II and mark correct option
- | Column-I | Column-II |
|--|--------------|
| A) Its partial hydrolysis doesnot change oxidation state of central atom | i) He |
| B) It is used in modern diving apparatus | ii) XeF_6 |
| C) It is used to provide inert atmosphere for filling electrical bulbs | iii) XeF_4 |
| D) Its central atom is in sp^3d^2 hybridisation | iv) Ar |
- | | A | B | C | D |
|----|----|-----|-----|-----|
| 1) | i | iv | ii | iii |
| 2) | i | ii | iii | iv |
| 3) | ii | i | iv | iii |
| 4) | i | iii | ii | iv |
64. Hydrometallurgy is useful ion the extraction of
 1) Sn 2) Al 3) Hg 4) Ag
65. Which of the following Lathanoid is Radio active
 1) Cerium 2) Promethium 3) Thulium 4) Lutesium
66. The complex $[Pt(Py)(NH_3)BrCl]$ will have how many geometrical isomers
 1) 0 2) 2 3) 3 4) 4
67. Which one of the following is employed as Antihistamine?
 1) Chloramphenicol 2) Diphenyl hydramine 3) Norethindrone 4) Omeprazole

68. The Amino acid containing Indole part is
 1) Tryptophan 2) Tryosome 3) Proline 4) Methionine
69. Which of the following statement is incorrect?
 1) Amylopectin is a branched polymer of α -glucose
 2) Cellulose is a linear polymer of β -glucose
 3) Glycogen is the food reserve of plants
 4) All protein are polymers of α -amino acids
70. The amine that can react with $C_6H_5SO_2Cl$ to form a product which is insoluble in alkali shall be
 1) 1° amine 2) 2° amine 3) 3° amine 4) Both 1° and 2° amine
71. Arrange the following acids in the decreasing order of the acidic strength
 I) $CH \equiv C - COOH$ II) C_6H_5COOH III) $CH_2 = CH - COOH$ IV) CH_3COOH
 Choose the correct option
 1) $I > II > III > IV$ 2) $I < II < III < IV$ 3) $I > III > II > IV$ 4) $I > IV > III > II$
72. Identify the product 'C' in the series
 $CH_3CN \xrightarrow{Na/C_2H_5OH} A \xrightarrow[H_2O]{HNO_2} B \xrightarrow{PDC} C$
 1) CH_3COOH 2) $CH_3CH_2NH_2$ 3) CH_3CHO 4) CH_3CONH_2
73. The order of reactivity of dehydration of alcohol is
 1) $1^\circ < 2^\circ > 3^\circ$ 2) $1^\circ < 2^\circ < 3^\circ$ 3) $1^\circ > 2^\circ < 3^\circ$ 4) $1^\circ > 2^\circ > 3^\circ$

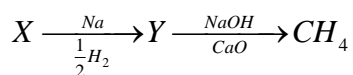
74.



75. $CH_3CH_2CH_2Br + NaCN \longrightarrow CH_3CH_2CH_2CN + NaBr$. This reaction will be fastest in
 1) Ethanol 2) Methanol
 3) N, N' dimethyl formamide (DMF) 4) Water
76. $A + 2B \rightleftharpoons 2C + D$, initial concentration of B was 1.5 times of A, but the equilibrium concentration of A and B are found to be equal. The K_c of reaction is
 1) 4 2) 8 3) 12 4) 16
77. A basic buffer contains 0.8 mole of NH_4Cl and 0.2 mole of NH_4OH for litre of a solution. The K_b of base is 1.8×10^{-5} , then the pH of the buffer solution is ($\log 1.8 = 0.2553$)
 1) 2.301 2) 6.345 3) 7.635 4) 8.6532
78. Three moles of an ideal gas expanded spontaneously into vacuum. The work done will be
 1) 3 Joules 2) 0 3) 9 Joules 4) Infinite
79. The correct order of melting point of IIIA group elements is
 1) $B > Al > Ga > In > Tl$ 2) $B > Al > Tl > Ga > In$
 3) $B > Al > Tl > In > Ga$ 4) $B > Al > In > Tl > Ga$
80. The AlO_2^- ion in a aqueous solution exists as
 1) $[Al(OH)_4]^-$ 2) $[Al(OH)_4 \cdot H_2O]^-$ 3) $[Al(OH)_6]^-$ 4) $[Al(OH)_4(H_2O)_2]^-$

81. Which of the following is incorrect for Group 14 elements
- 1) The stability of dihalides are in the order $CX_2 < SiX_2 < GeX_2 < SnX_2 < PbX_2$
 - 2) The ability to form $p\pi-p\pi$ multiple bonds among themselves increases down the group
 - 3) The tendency for catenation decreases down the group
 - 4) They all form oxides with the formula MO_2
82. TLV values of four pollutants A, B, C and D are 2ppm, 9 ppm, 20 ppm and 50 ppm. Among these four pollutants which one is the most toxic pollutant?
- 1) A
 - 2) B
 - 3) C
 - 4) D
83. The amount of oxygen required for healthy growth of plants and animals in water is
- 1) 1-2mg/ml
 - 2) 4-6mg/litre
 - 3) 4-6 g/Lit
 - 4) 1-2 g/ml
84. $N_{2(g)} + 2O_{2(g)} \rightarrow 2NO_2 + x KJ$
 $2NO_{(g)} + O_{2(g)} \rightarrow 2NO_{2(g)} + y KJ$
 The enthalpy of formation of NO is
- 1) $x - y$
 - 2) $\frac{1}{2}(x - y)$
 - 3) $\frac{1}{2}(y - x)$
 - 4) $(2x - 2y)$
85. The correct IUPAC name of $CH_3 - C - CH_2 - Cl$
- $$\begin{array}{c} C_2H_5 \\ | \\ CH_3 - C - CH_2 - Cl \\ | \\ C_2H_5 \end{array}$$
- 1) 1-chloro - 2,2-diethyl-2-methyl ethane
 - 2) 1-chloro-2,2-diethyl propane
 - 3) 1-chloro - 2- ethyl-2-methyl butane
 - 4) 1-chloro - 2,2-diethyl propane
86. Among the following which has L-configuration
- 1) $\begin{array}{c} COOH \\ | \\ H - C - NH_2 \\ | \\ CH_3 \end{array}$
 - 2) $\begin{array}{c} COOH \\ | \\ H_2N - C - H \\ | \\ HO - C - H \\ | \\ CH_3 \end{array}$
 - 3) $\begin{array}{c} CHO \\ | \\ HO - C - H \\ | \\ H - C - OH \\ | \\ CH_2OH \end{array}$
 - 4) $\begin{array}{c} CHO \\ | \\ HO - C - H \\ | \\ HO - C - H \\ | \\ H - C - OH \\ | \\ CH_2OH \end{array}$
87. Most stable carbanion is
- 1)
 - 2)
 - 3)
 - 4)
88. The best method of separation of naphthalene and benzoic acid from their mixture is
- 1) Crystallisation
 - 2) Chromatography
 - 3) Distillation
 - 4) Sublimation

89. What is 'X' in the following sequence of reaction?



- 1) Methanol 2) Methanoic acid 3) Ethanoic acid 4) Methanal
90. Arrange the following alkenes in the descending order of their reactivity with HBr
- a) ethene b) propene c) 2-Butene d) 2-methyl-2-Butene
- 1) a>b>c>d 2) d>c>b>a 3) d>c>a>b 4) a>b>d>c

BIOLOGY

91. Which of the following statements is wrong w.r.t. rules of nomenclature?

- 1) The first word denoting the genus starts with a capital letter
 2) The specific epithet starts with a small letter
 3) Biological names are printed in italics to indicate their latin origin
 4) In the biological name – *Mangifera indica L.*, 'L' denotes the word 'Latin'

92. Amphibia belongs to division

- 1) Tetrapoda 2) Pisces 3) Agnatha 4) Gnathostomata

93. A suitable vector must have :

- 1) more than one ori for replication
 2) many restriction sites of a restriction endonuclease
 3) selectable marker genes for identification
 4) all of the above

94. In flatworms specialized cells are help in osmoregulation and excretion are

- 1) Renetti cells 2) Flame cells
 3) Nephridia 4) Cholorogogen cells

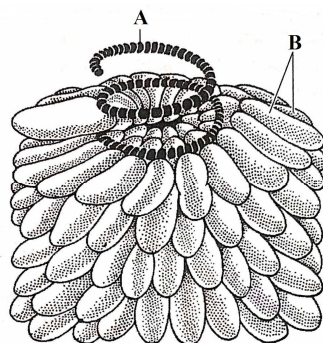
95. The parasitic fungi on mustard is

- 1) *Albugo* 2) *Rhizopus* 3) *Mucor* 4) *Agaricus*

96. Which connective tissue support frame work for epithelium

- 1) Areolar tissue 2) Adipose tissue
 3) Dense connective tissue 4) Specialized connective tissue

97. Identify the virus and name the structures A and B



- 1) TMV, A=ssRNA, B=capsid 2) TMV, A=dsRNA, B=capsid
 3) TMV, A=capsid, B=ssRNA 4) TMV, A=capsid, B=dsRNA

98. In cockroach blood vessels are purely developed and open into

- 1) Spongocoel 2) Spinal neurocoel 3) Blastocoel 4) Haemocoel

99. The artificial system of classification gives equal weightage to vegetative and sexual characters. This is not acceptable as

- 1) Sexual characters are more easily affected by the environment than vegetative characters
 2) Vegetative characters are more easily affected by the environment than sexual characters
 3) Both vegetative and sexual characters are equally affected by the environment
 4) Neither vegetative nor sexual characters are affected by the environment