

PHYSICS AND CHEMISTRY

- Among the energy units, erg, Joule, eV and calorie which one represents numerically the lowest energy units?
 - Joule
 - Calorie
 - Erg
 - eV
- An astronaut accidentally gets detached out of his spaceship accelerating in interstellar space at constant rate of $1000ms^{-2}$. What is the acceleration of the astronaut out side the spaceship?
 - $1000ms^{-2}$
 - $-1000ms^{-2}$
 - Zero
 - $9.8ms^{-2}$
- Pluto is not included now as a planet of our solar system due to its
 - Very large mass
 - Very small size and mass
 - Large elliptical orbit
 - As the farthest object
- Velocity of a body executing SHM with amplitude A , angular frequency ω and instantaneous displacement y is given by
 - $A\omega y$
 - $\omega\sqrt{A^2 - y^2}$
 - $\omega\sqrt{A^2 + y^2}$
 - $\frac{Ay}{\omega}$
- The phase of a particle executing SHM, when it has maximum velocity would be
 - $\frac{\pi}{2}$
 - $\frac{\pi}{4}$
 - 0 or π
 - $\frac{\pi}{2}$ or $\frac{\pi}{4}$
- Velocity of sound in a monatomic gas of known density (ρ) and pressure (P) is given by
 - $v = \sqrt{1.66(P \rho)}$
 - $v = \sqrt{\frac{P}{1.66\rho}}$
 - $v = \sqrt{\frac{\rho}{1.66P}}$
 - $v = \sqrt{\frac{1.66P}{\rho}}$

7. The persistence of sound in our ears as a result of successive reflections is known as
- A. Echelon effect
B. Beats
C. Reverberation
D. whispering
8. The frequency (f) of vibration of a body varies proportional to its dimension (l) according to
- A. $f \propto l$
B. $f \propto \frac{1}{l}$
C. $f \propto l^{\frac{1}{2}}$
D. $f \propto l^{-\frac{1}{2}}$
9. Claude process is used for
- A. A separating mixture of two gases
B. Liquefying air
C. Cleaning integrated circuits
D. Semiconductor doping
10. Meissner effect is related to
- A. Super fluids
B. Organic conductors
C. Carbon nano tubes
D. Super conductors
11. Cryogenic pumps can produce vacuum up to
- A. $10^{-6} - 10^{-13} Pa$
B. $10^{-3} - 10^{-4} Pa$
C. $10^{-13} - 10^{-18} Pa$
D. $10^{-1} - 10^{-3} Pa$
12. Pulsar is rotating
- A. Neutron star
B. Red giant
C. Black hole
D. Star like sun
13. A perfectly elastic body is the one whose deformation obeys
- A. Newton's law
B. Kelvin's law
C. Hooke's law
D. Young's law
14. Heat capacity of a single mole of a substance is called
- A. Specific heat
B. Molar heat
C. Molar heat capacity
D. Molar energy
15. In an adiabatic process, the heat capacity becomes
- A. Positive
B. Negative
C. Zero
D. One

75. The energy emitted by the sun is basically due to
- A. Carbon burning
B. Helium burning
C. Oxygen burning
D. Hydrogen burning
76. Which of the following solutions will possess the lowest boiling point ?
- A. 1% Glucose solution
B. 1% NaCl solution
C. 1% Sucrose solution
D. 1% Urea solution
77. A spontaneous change is one in which the system suffers
- A. Lowering of entropy
B. No energy change
C. A lowering of free energy
D. An increase in internal energy
78. When the reaction $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ is carried out in an open lime kiln, it proceeds to completion because
- A. CaO and CO_2 do not react with each other
B. CO_2 escapes
C. CaO is much more stable than CaCO_3
D. The temperature in the Kiln is very high
79. Which one of the following equilibria is not affected by pressure ?
- A. $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$
B. $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$
C. $2\text{SO}_2 + \text{O}_2 \rightleftharpoons 2\text{SO}_3$
D. $\text{N}_2 + \text{O}_2 \rightleftharpoons 2\text{NO}$
80. The following four colourless salt solutions are placed in separate test tubes and a strip of copper is placed in each solution. Which one finally turns blue ?
- A. $\text{Zn}(\text{NO}_3)_2$
B. ZnSO_4
C. KNO_3
D. AgNO_3
81. In a reaction : $2\text{A} + \text{B} \rightarrow \text{C} + \text{D}$, the molecularity of the reaction is
- A. 2
B. 0
C. 3
D. 1
82. Which one of the following statements regarding catalyst is not true ?
- A. A catalyst remains unchanged at the end of the reaction
B. A catalyst can initiate a reaction
C. A catalyst does not alter the equilibrium in a reversible reaction
D. Catalysts are sometimes very specific in terms of reactions

83. The number of atoms in a face centred cubic unit cell is
- A. 2
C. 5
- B. 4
D. 6
84. Which element has the greatest tendency to lose electrons?
- A. F
C. S
- B. Fr
D. Be
85. A transition metal 'X' has an electronic configuration of $[\text{Ar}] 3d^4$ in its +3 oxidation state. Its atomic number is
- A. 25
C. 22
- B. 26
D. 19
86. The nature of chemical bonding in diamond is
- A. Ionic
C. Coordinate
- B. Covalent
D. Metallic
87. The bonds present in N_2O_5 are
- A. Only ionic
C. Only coordinate
- B. Only covalent
D. Covalent and coordinate
88. When a lead storage battery is discharged
- A. SO_2 is evolved
C. Lead sulphate is consumed
- B. Lead is formed
D. Sulphuric acid is consumed
89. The maximum number of isomers for an alkene with molecular formula C_4H_8 is
- A. 2
C. 3
- B. 4
D. 5
90. The compound having both sp^2 and sp^3 hybridised carbon atom is
- A. Propane
C. Propyne
- B. Propene
D. Propadiene
91. Water and ethyl alcohol are separated by
- A. Sublimation
C. Vacuum distillation
- B. Steam distillation
D. Fractional distillation

92. Catalyst used in Kjeldahl's method for the estimation of nitrogen is
- A. Sodium
C. Mercury
- B. Magnesium
D. Copper
93. Which of the following decolourises alkaline KMnO_4 ?
- A. C_3H_8
C. CH_4
- B. C_2H_4
D. CCl_4
94. The compound that is most reactive towards electrophilic nitration is
- A. Toluene
C. Benzoic acid
- B. Benzene
D. Nitrobenzene
95. The formation of acetylene from ethylene bromide is an example of
- A. Elimination reaction
C. Addition reaction
- B. Spontaneous reaction
D. Substitution reaction
96. Which of the following rings is most strained?
- A. Cyclopropane
C. Cyclopentane
- B. Cyclobutane
D. Cyclohexane
97. Liquid hydrocarbon is converted to a mixture of gaseous hydrocarbons by
- A. Hydrolysis
C. Oxidation
- B. Cracking
D. Distillation under reduced pressure
98. Chlorobenzene can be prepared by reacting aniline with
- A. Hydrochloric acid
B. Cuprous chloride
C. Chlorine in presence of anhydrous cuprous chloride
D. Nitrous acid followed by heating with cuprous chloride
99. The widely used plastic PVC is a polymerization product of
- A. $\text{CH}_2=\text{CH}_2$
C. $\text{CHCl}=\text{CHCl}$
- B. $\text{CH}_2=\text{CCl}_2$
D. $\text{CH}_2=\text{CHCl}$
100. Alkaline hydrolysis of an ester is called
- A. Neutralization
C. Polymerization
- B. Esterification
D. Saponification

101. Which of the following is an ester?
- A. Cotton seed oil
B. Soap
C. Glycerine
D. Kerosene oil
102. When an aniline is heated with chloroform and caustic potash solution, we get
- A. Phenol
B. Phenyl isocyanide
C. 2-Chloroaniline
D. Benzoic acid
103. Nitrobenzene on reduction in acidic medium gives
- A. Aniline
B. Nitrosobenzene
C. Azobenzene
D. Phenylhydroxylamine
104. Among the following the most basic compound is
- A. Benzylamine
B. Aniline
C. Acetanilide
D. 4-Nitroaniline
105. Formic acid and acetic acid may be distinguished by reaction with
- A. Sodium
B. Dilute acidic permanganate
C. 2,4-Dinitrophenylhydrazine
D. Sodium ethoxide
106. Citrous fruits are an important source of vitamin
- A. B
B. C
C. D
D. K
107. Starch is
- A. $C_6H_{10}O_5$
B. $(C_6H_{10}O_5)_n$
C. $C_{12}H_{22}O_{11}$
D. $(C_6H_{12}O_6)_n$
108. The main structural feature of proteins is
- A. Ester linkage
B. Ether linkage
C. Peptide linkage
D. All the above
109. A solution of sodium metal in liquid ammonia is a strong reducing agent due to the presence of
- A. Sodium atoms
B. Sodium hydride
C. Sodium amide
D. Solvated electrons

117. With increasing quantum number the energy difference between adjacent energy levels in atoms,
- A. Decreases
 - B. Increases
 - C. Remains constant
 - D. Decreases for low z and increases for high Z values
118. When $4p$ subshell is completed, the new electron goes into
- A. $5p$
 - B. $4d$
 - C. $5s$
 - D. $4f$
119. The number of neutrons in the parent nucleus which gives ^{14}N on beta emission is
- A. 6
 - B. 7
 - C. 8
 - D. 14
120. The compound which contains both ionic and covalent bonds is
- A. CH_4
 - B. H_2
 - C. KCN
 - D. KCl
121. BF_3 is a/an
- A. Electron deficient compound
 - B. Ionic compound
 - C. Lewis base
 - D. Coordinate compound
122. The temperature at which a real gas obeys the ideal gas laws over a wide range of pressure is
- A. Critical temperature
 - B. Boyle's temperature
 - C. Inversion temperature
 - D. Reduced temperature
123. Rate of diffusion of a gas is
- A. Directly proportional to its density
 - B. Directly proportional to its molecular mass
 - C. Directly proportional to the square root of its molecular mass
 - D. Inversely proportional to the square root of its molecular mass
124. If a gas expanded at constant temperature
- A. The pressure decreases
 - B. The kinetic energy of molecules remains same
 - C. The kinetic energy of the molecules decreases
 - D. The number of molecules of the gas increases

125. 2% (by mass) solution of sodium chloride (MW = 58) is prepared. The molality of this solution is approximately

- A. 0.02 molal B. 0.25 molal
C. 0.35 molal D. 2.00 molal

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Education