## PHYSICS AND CHEMISTRY

1. Among the energy units, erg, Joule, *eV* and calorie which one represents numerically the lowest energy units?

A. JouleB. CalorieC. ErgD. eV

2. An astronaut accidentally gets detached out of his spaceship accelerating in interstellar space at constant rate of  $1000 ms^{-2}$ . What is the acceleration of the astronaut out side the spaceship?

Α.	$1000  ms^{-2}$	В.	$-1000  ms^{-2}$
C	Zero	D	$9.8 m s^{-2}$

3. Pluto is not included now as a planet of our solar system due to its

Α.	Very large mass	100
C.	Large elliptical orbit	

B. Very small size and massD. As the farthest object

- 4. Velocity of a body executing SHM with amplitude A, angular frequency  $\omega$  and instantaneous displacement y is given by
  - A.  $A\omega y$ C.  $\omega \sqrt{A^2 + y^2}$ B.  $\omega \sqrt{A^2 - y^2}$ D.  $\frac{Ay}{\omega}$
- 5. The phase of a particle executing SHM, when it has maximum velocity would be

A. 
$$\frac{\pi}{2}$$
  
B.  $\frac{\pi}{4}$   
C.  $0 \text{ or } \pi$   
D.  $\frac{\pi}{2} \text{ or } \frac{\pi}{4}$ 

6. Velocity of sound in a monatomic gas of known density ( $\rho$ ) and pressure (P) is given by

A. 
$$v = \sqrt{1.66(P \rho)}$$
  
B.  $v = \sqrt{\frac{P}{1.66\rho}}$   
C.  $v = \sqrt{\frac{\rho}{1.66P}}$   
D.  $v = \sqrt{\frac{1.66P}{\rho}}$ 

7. The persistence of sound in our ears as a result of successive reflections is known as

A.	Echelon effect	В.	Beats
C.	Reverberation	D.	whispering

- The frequency (f) of vibration of a body varies proportional to its dimension 8. (1) according to
  - A.  $f \propto l$ B.  $f \propto \frac{1}{r}$ C.  $f \propto l^{\frac{1}{2}}$ D.  $f \propto l$
- 9. Claude process is used for

10.

- A. A separating mixture of two gases Β. Liquefying air C. Cleaning integrated circuits D. Semiconductor doping
- Super fluids A. Carbon nano tubes C

Meissner effect is related to

- Organic conductors Β. Super conductors D.
- 11. Cryogenic pumps can produce vacuum up to
- $10^{-6} 10^{-13} Pa$  $10^{-3} - 10^{-4} Pa$ A В.  $10^{-13} - 10^{-18} Pa$ C. D.  $10^{-1} - 10^{-1}$ Pa 12. Pulsar is rotating Red giant Β. Neutron star A. Star like sun C. Black hole D. A perfectly elastic body is the one whose deformation obeys 13. B. Kelvin's law A. Newton's law C. Hooke's law D. Young's law 14. Heat capacity of a single mole of a substance is called Specific heat Β. Molar heat A. C. Molar heat capacity D. Molar energy

In an adiabatic process, the heat capacity becomes 15.

C.

B. Negative A. Positive Zero D. One

2 CUSAT 2008 – Physics & Chemistry | Education Online Desk, Mathrubhumi 16. Two springs of force constant  $k_1$  and  $k_2$  are connected in series with a mass attached to free end of the combination. The resulting force constant of the arrangement is given by

А.	$k = k_1 + k_2$	В.	$\frac{1}{k} = \frac{1}{k_1} + \frac{1}{k_2}$
C.	$k = \sqrt{k_1 k_2}$		$k =  k_1 - k_2 $

17: Two trains are approaching each other with the same speed of 72 km/hr in parallel tracks. The frequency of one's whistle heard by a passenger sitting in the other trains is 700Hz. What is the original frequency of the whistle?

А.	700 Hz	Β.	4Hz
C.	550 Hz	D.	430 Hz

18. The volume of ideal gas increases by 24% during an adiabatic process. Its pressure will [assume  $\gamma = 5/3$ ]

Α.	Increase by 40%	В.	Decrease by 40%
C.	Decrease by 24%	1 <b>D</b> .	Increase by 24%

19. On what factors does the efficiency of a Carnot's engine depend?

A.	Temperature	of th	ie source	and sink	

- B. Temperature of the source and pressure of the sink
- C. Volume of the source and sink
- D. Volume of the sink and temperature of the source
- 20. A black body at  $T^0$ K emits E amount of radiant energy from its surface of  $1m^2$  in 1 Sec. If its temperature is halved, the amount of energy emitted will be

A. 
$$\frac{E}{4}$$
 B.  $\frac{E}{2}$   
C.  $\frac{E}{8}$  D.  $\frac{E}{16}$ 

- 21. A big piece of glass is heated and while cooling a crack is developed in it. The possible reason for this is
  - A. Small thermal conductivity of glass
  - B. Large thermal expansion of the glass
  - C. Large specific heat of glass
  - D. High melting point of glass

22.  $^{120}$  A balloon is blown at a depth of 4.9m down the water surface in a lake. The volume of air filled in the balloon is 50 cc. When the balloon is brought to the surface of the lake, it will expand to

Α.	60 cc	В.	75 cc
C.	100 <i>cc</i>	D.	90 cc
$p = 1 \leq 1$	(1 · · · ))		

Surface tension of soap solution is  $1.9 \times 10^{-2} Nm^{-1}$ . The work done in Joule to blow a 23. soap bubble of diameter 2.0 cm would be

Α.	$7.6 \times 10^{-6} \pi$	В.	$15.2 \times 10^{-6} \pi$	
C.	1.9×10 <sup>-6</sup> π	D.	$2.2 \times 10^{-4} \pi$	

24. Nano materials have important applications due to its

- Α. Large surface area Β. Large volume C. Spherical shape D. Atomic size
- 25. Among the nucleons n, and  $\pi^{\pm 0}$  which one possesses the longest life time?
  - A. n C.  $\pi^{+}$

A plane is traveling eastward at an air speed of 500 km/hr. But 90 km/hr wind is blowing 26. southward. The speed and direction of the plane relative to an observer on ground is

B. p

D. π<sup>0</sup>

- $508 \, km / hr$  at about  $10^{\circ}$  south of east A.
- B.  $590 \, km/hr$  at about  $20^{\circ}$  south of east
- C. 508 km / hr towards west
- D.  $590 \, km / hr$  at about  $30^{\circ}$  south of east
- 27 Under action of concurrent forces if a body is in motion with constant vector velocity, then it is said to be in
  - A. Static equilibrium Rotational equilibrium
- B. Transitional equilibrium

- D. Not in equilibrium
- A ball is dropped from rest at a height of 50m above the earth's surface. It hits the 28. ground with a speed of
  - A. 50 m/s

C.

C. Zero m/s

- B. 500 m/s
- D. 31 m/s

29. A city bus is moving with a speed of 20 m/s begins to slow at a rate of 3 m/s each second. How far it goes before stopping?

A.	67 m	В.	60 m
C.	100 m	D.	6.7 m

30. When the elevation of a projectile changes from 30° to 60°, keeping its same horizontal distance, its vertical height changes by

Α.	5 times	В.	$\sqrt{2}$ times
C.	3 times	D.	$\sqrt{3}$ times

31. The least acceleration with which a 45 kg woman can slide down a rope if the rope can withstand a tension of only 300 N is around

Α.	9.8 $ms^{-2}$	В.	$3.1 ms^{-2}$
C.	30 ms <sup>-2</sup>	D.	$45 m s^{-2}$

32. Assuming earth a sphere of radius  $6370 \, km$ , its mass can be estimated as [given  $g = 9.8m/s^2$ ,  $G = 6.67 \times 10^{-11} \, Nm^2 / kg^2$ ]

A.	$10 \times 10^{25} kg$	В.	$6 \times 10^{32} kg$	
C.	$5.5 \times 10^{24} kg$	D.	$6 \times 10^{24} kg$	

33. The coefficient of static friction between a body of mass m and a flat bed of a truck is 0.6. What is the maximum acceleration the truck can have along a flat road if the box is not to slide down?

Α.	$6.0  ms^{-2}$	В.	$10  ms^{-2}$
C.	$0.6 m s^{-2}$	D.	$32 m s^{-2}$

34. The radius of the earth is about 6370 km while that of Mars about 3440 km and Mars has a mass 0.11 times that of earth. If an object weighs 200 N on earth what would be its weight on Mars?

Α.	200 N	В.	22 N
С.	75 N	D.	400 N

- 35. The quantity force  $\times$  velocity represents
  - A. EnergyC. Momentum
- B. Accelerated force

D. Power

36. A 2kg mass falls down from a height of 4m. How much work was done on it by the gravity?

A.	78 J	В.	8 J
C.	8 <i>kJ</i>	D.	780 J

37. A projectile is shot upward from earth with a speed of 20 m/s. What height it would reach when its speed becomes 8.0 m/s?

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Α.	160 m	В.	17 m
C.	3 m	D.	27 m

38. Ideal mechanical advantages (IMA) of a machine is defined as the ratio

A.	force ceased to operate the machine
	distance moved by load
B.	Distance moved by input force
	distance moved by load
~	Force exerted by machine on load

- D. force used to operate the machine
  - force exerted by machine on load
- 39. During a collision process, if the two colliding bodies stick together after collision then its coefficient of restitution (*e*) becomes :

Α.	e = 1	В.	e > 1
C.	<i>e</i> < 1	D.	e = 0

40. An 8 gm bullet fired horizontally with an initial speed of 450 m/s went into a wooden block of mass 9kg and embedded in it. If the block is free to move, what would be its velocity after the impact?

A.	40 <i>cm</i> / <i>s</i>	В.	450 cm/s
C.	4m/s	D.	40m/s

41. A 2 kg brick is hurled at a speed of 6m/s. How large a counteracting force is needed if the brick is to be stopped in a time of 6 milliseconds.

Α.	2 N	Β.	120 N
C.	2 <i>kN</i>	D.	0.002 N

42. A ball is dropped from a height on to a flat floor. It reaches a height of 144 cm on the first bounce and 81 cm on the second bounce. What height it attains on the 3<sup>rd</sup> bounce approximately?

Α.	63 cm	В.	18 cm
С.	46 cm	D.	54 cm

43. For a point mass moving with constant speed v around a circle, the ratio of the square of its tangential velocity to the radius of circular path is the

Α.	Angular acceleration	В.	Centripetal acceleration
C.	Tangential acceleration	D.	Acceleration due to gravity

44. A pulley of a motor is revolving 30 *rev*/s and slows down uniformly 20 *rev*/s in 2 sec . How many number of revolutions the pulley does during this time duration ?



- 45. An angular impulse on a body can cause
  - A. No change in its angular momentum
  - B. A change in its linear momentum
  - C. A change in its angular momentum
  - D. A change in its mass
- 46. The moment of inertia of a solid sphere rotating about its diameter is given by

A.	$\frac{2}{5}Mr^2$	В.	$\frac{3}{4}Mr^2$
C.	$\frac{5}{2}Mr^2$	D.	$\frac{4}{5}Mr^2$

47. The unit  $N/m^2$  represents pressure, it is also a unit for

Α.	Force	В.	Torque
C.	Young's modulus	D.	Compressibility

48. A block of mass tied with a string is immersed in water. The tension on the string would be [BF=Boyant force]

Α.	T = BF	В.	T = mg + BF
С.	T = mg	D.	T = mg - BF

49.	piece of ice floats in fresh water? [The densit	
	A. 8.3% C. 91.7%	B. 9.17% D. 0.83%
50.	A piece of pure gold (the density of gold = 3 hole inside. It weighs 40 $gm$ in air and 37 $gm$	$20 gm/cm^3$ is suspected to have a spherical <i>i</i> in water. How big is the hole?
	A. $4.6cm^3$ C. $3.0 cm^3$	B. $1.0 cm^3$ D. $0.3 cm^3$
51.	A steel foot scale is calibrated at $25^{\circ}$ . On a what will be the percentage error in (coefficient of linear expansion of steel= $1.0 \times$	
	A. 0.04% C. 0.025%	B. 0.5% D. 0.01%
52.	Density of $CH_4$ gas at $20^{\circ}$ C and 5 atm Press	ure is about
	A. $5.52kg / m^3$ C. $10.0kg / m^3$	B. $8.32kg/m^3$ D. $3.32kg/m^3$
53.	How many He atoms are there in 2.0g of heli	um?
	A. $3.0 \times 10^{23}$ C. $8.0 \times 10^{26}$	B. $6.2 \times 10^{23}$ D. $3.0 \times 10^{27}$
54.	The r.m.s speed of a nitrogen molecule in air	at $0^{\circ}$ C would be about
	<ul> <li>A. 550<i>m</i>/<i>s</i></li> <li>C. 490<i>m</i>/<i>s</i></li> </ul>	<ul> <li>B. 250 m/s</li> <li>D. 640 m/s</li> </ul>
55.	Two ideal gases are characterized by their their r.m.s speed at a given temperature is given	molecular weight $M_1$ and $M_2$ . The ratio of ven by
	A. $\sqrt{\frac{M_2}{M_1}}$ C. $\frac{M_1}{M_2}$	B. $\sqrt{\frac{M_1}{M_2}}$
	C. $\frac{M_1}{M_2}$	D. $\frac{M_2}{M_1}$

What is the fraction of the volume in percentage exposed above the water surface, if a

49.

56. A thermos bottle contains 250g of coffee at 90°C. To this, 20g of milk at 50°C is added. After attaining thermal equilibrium, what would be the temperature of the coffee with milk? [assume no heat loss and assuming that water, coffee and milk have same specific heat]

A.	$80^{\circ}$ C	В.	84°C
C.	43°C	D.	20°C

At what rate the energy will be radiated from black body surface at temp T and area A? 57.

Α.	$\sigma T^4$	В.	$\frac{\sigma T^4}{A}$
C.	$A\sigma T^4$	D.	$A(\sigma T)^4$

58. The most probable state of a system is the state with

А.	Smallest entropy	В.	Largest energy
C.	Largest entropy	D.	Smallest entropy and smallest energy

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59. The speed of sound wave in a liquid depends on the elastic constant (E) and density  $(\rho)$  of the medium as 100

A. 
$$\frac{E}{\rho}$$
 EOUCB. EPTON  
C.  $\sqrt{\frac{\rho}{E}}$  D.  $\sqrt{\frac{E}{\rho}}$ 

## 60. Energy stored in a capacitor is given by [q is charge, c-capacity, V is the voltage]

A. 
$$\frac{qc^2}{2}$$
  
B.  $\frac{q^2V}{2}$   
C.  $\frac{q^2}{2c}$   
D.  $\frac{qV^2}{2}$ 

61. The resistance of a conducting wire of length l and cross sectional area A is related to the resistivity of the material according to the relations

A. 
$$R = \frac{lA}{\rho}$$
  
B.  $R = l\rho A$   
C.  $R = \frac{l\rho}{A}$   
D.  $R = \frac{\rho A}{l}$ 

62. The number of electrons flowing through a filament bulb in each second, if a current of 1.6 Ampere passes through would be

Α.	$1.6 \times 10^{19}$	В.	$1.0 \times 10^{19}$
C.	$1.6 \times 10^{17}$	D.	1018

63. The time constant of a L-R circuit is given by

A. 
$$\frac{L}{R}$$
  
B.  $LR$   
C.  $\frac{R}{L}$   
D.  $LR^2$ 

64. The phase angle between Voltage (V) and current (I) of a series circuit containing resistance, inductance and capacitance is given by

A. 
$$\tan \phi = \frac{R}{X_L X_C}$$
  
B.  $\tan \phi = \frac{X_L X_C}{R}$   
C.  $\tan \phi = \frac{X_L - X_C}{R}$   
D.  $\tan \phi = \frac{R}{X_L - X_C}$ 

65. Luminous efficiency of any lamp is measured in

- A. Lumen
  C. Lumen/m<sup>2</sup>
  D. Lumen/Volt
- C. Lument m
- 66. The illumination from fluorescent tube light decreases with the radial distance according to the relation [assume r [ length of the tube light]

A. 
$$E \propto \frac{1}{r}$$
  
B.  $E \propto \frac{1}{r^2}$   
C.  $E \propto \frac{1}{r^3}$   
D.  $E \propto \frac{1}{\sqrt{r}}$ 

67. Critical angle for light propagating from glass (n = 1.5) to water (n = 1.3) is

A. 
$$\sin^{-1}\left(\frac{15}{13}\right)$$
 B.  $\cos^{-1}\left(\frac{15}{1.3}\right)$ 

 C.  $\sin^{-1}\left(\frac{13}{15}\right)$ 
 D.  $\tan^{-1}\left(\frac{1.3}{15}\right)$ 

68. What is the minimum value of refractive index for a  $45^{\circ}$  prism which is used to turn a beam of light by total internal reflection through  $90^{\circ}$ ?

A.	1.41	В.	2.42
C.	1.54	D.	1.33

69. Two thin lenses of focal lengths  $f_1$  and  $f_2$  are used in contact combination. The resultant focal length of the combination is given by

A.	$f = f_1 + f_2$	В.	$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$
C.	$f = \sqrt{f_1 f_2}$	D.	$f = \left  f_1 - f_2 \right $

70. A lens of focal length, f, projects up on a screen the image of a luminous object magnified M times. Then the distance of the screen from the lens is



71. How fast a massive body requires to move so as to increase its mass by 1% larger than its rest mass?

A.	$4.2 \times 10^7 m/s$	В.	$3.0 \times 10^8 m/s$
C.	$9.8 \times 10^6 m/s$	D.	$2.0 \times 10^7 m/s$

72. One photon of light with 1240nm wave length carries an energy equivalent of

А.	1 eV		Β.	$1.24 \ eV$
C.	2.8 eV		D.	12.4 eV

73. The electrical potential required to be supplied to an electron microscope to attain an electron a wave length of  $0.5A^{0}$  is about

Α.	800 V	В.	500 V
C.	600 V	D.	250 V

74. What would be the wave length of Balmer lines making a transition from  $n = \infty$  to n = 2 transition?

A.	365 nm	В.	600 nm
C.	470 nm	D.	540 nm

75. The energy emitted by the sun is basically due to

Α.	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 CaCO<sub>3</sub>  $\rightarrow$  CaO + CO<sub>2</sub> is carried out in an open lime kiln, it proceeds to completion because
  - A. CaO and CO2 do not react with each other
  - B. CO<sub>2</sub> 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. $N_2 + 3H_2 \rightleftharpoons 2NH_3$	B. $PCl_5 \rightleftharpoons PCl_3 + Cl_2$
C. $2SO_2 + O_2 \rightleftharpoons 2SO_3$	D. N <sub>2</sub> + O <sub>2</sub> $\implies$ 2NO

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 ?

Α.	$Zn(NO_3)_2$	B. ZnSO <sub>4</sub>
С.	KNO3	D. AgNO <sub>3</sub>

81. In a reaction :  $2A + B \rightarrow C + D$ , the molecularity of the reaction is

А.	2	Β.	0
С.	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 le	lose electrons?
	A. F C. S	B. Fr D. Be
85.	A transition metal 'X' has an electronic costate. Its atomic number is	onfiguration of [Ar] $3d^4$ in its +3 oxidation
	A. 25 C. 22	B. 26 D. 19
86.	The nature of chemical bonding in diamond i	ÎS
	A. Ionic C. Coordinate	B. Covalent D. Metallic
87.	The bonds present in N <sub>2</sub> O <sub>5</sub> are	
	<ul><li>A. Only ionic</li><li>C. Only coordinate</li></ul>	<ul><li>B. Only covalent</li><li>D. Covalent and coordinate</li></ul>
88.	When a lead storage battery is discharged	
	A. SO <sub>2</sub> is evolved	B. Lead is formed
	C. Lead sulphate is consumed	D. Sulphuric acid is consumed
89.	The maximum number of isomers for an alke	ene with molecular formula $C_4H_8$ is
	A. 2	B. 4
	C. 3	D. 5
90.	The compound having both $sp^2$ and $sp^3$ hybrid	oridised carbon atom is
	<ul><li>A. Propane</li><li>C. Propyne</li></ul>	<ul><li>B. Propene</li><li>D. Propadiene</li></ul>
91.	Water and ethyl alcohol are separated by	
	<ul><li>A. Sublimation</li><li>C. Vacuum distillation</li></ul>	<ul><li>B. Steam distillation</li><li>D. Fractional distillation</li></ul>

92. Catalyst used in Kjeldahl's method for the estimation of nitrogen is A. Sodium B. Magnesium D. Copper C. Mercury 93. Which of the following decolourises alkaline KMnO4? A. C<sub>3</sub>H<sub>8</sub> B. C<sub>2</sub>H<sub>4</sub> C.  $CH_4$ D.  $CCI_4$ 94. The compound that is most reactive towards electrophilic nitration is Toluene B. Benzene A. C. Benzoic acid D. Nitrobenzene 95. The formation of acetylene from ethylene bromide is an example of Elimination reaction Β. Spontaneous reaction А. D. Substitution reaction Addition reaction C. Which of the following rings is most strained? 96. Cyclopropane B. Cyclobutane A. Cyclohexane C. Cyclopentane D. 97. Liquid hydrocarbon is converted to a mixture of gaseous hydrocarbons by Hydrolysis Β. Cracking Α. Oxidation D. Distillation under reduced pressure C. 98. Chlorobenzene can be prepared by reacting aniline with Hydrochloric acid Α. Β. Cuprous chloride C. Chlorine in presence of anhydrous cuprous chloride Nitrous acid followed by heating with cuprous chloride D. 99. The widely used plastic PVC is a polymerization product of A. CH<sub>2</sub>=CH<sub>2</sub> B. CH,=CCI, C. CHCI=CHCI D. CH2=CHCI 100. Alkaline hydrolysis of an ester is called

- Neutralization A. C.
  - Polymerization
- Esterification B.
- Saponification D.

101.	Which of the following is an ester?		
	<ul><li>A. Cotton seed oil</li><li>C. Glycerine</li></ul>	B. D.	Soap Kerosene oil
102.	When an aniline is heated with chloroform an	nd ca	ustic potash solution, we get
	<ul><li>A. Phenol</li><li>C. 2-Chloroaniline</li></ul>	B. D.	Phenyl isocyanide Benzoic acid
103.	Nitrobenzene on reduction in acidic medium	gives	
	<ul><li>A. Aniline</li><li>C. Azobenzene</li></ul>	B. D.	Nitrosobenzene Phenylhydroxylamine
104.	Among the following the most basic compou	nd is	
	<ul><li>A. Benzylamine</li><li>C. Acetanilide</li></ul>	B. D.	Aniline 4-Nitroaniline
105.	Formic acid and acetic acid may be distingui	shed	by reaction with
	<ul><li>A. Sodium</li><li>C. 2,4–Dinitrophenylhydrazine</li></ul>	B. D.	Dilute acidic permanganate Sodium ethoxide
106.	Citrous fruits are an important source of vitat	min	
	A. B C. D	B. D.	Ск
i07.	Starch is		
	A. $C_6 H_{10} O_5$ C. $C_{12} H_{22} O_{11}$	B. D.	$(C_6H_{10}O_5)_n$ $(C_6H_{12}O_6)_n$
	$C_{12} C_{12} C_{12} C_{11}$	D.	$(\mathcal{C}_{6}^{11}\mathcal{L}_{12}^{12}\mathcal{C}_{6}^{1})_{n}$
108.	The main structural feature of proteins is		
	<ul><li>A. Ester linkage</li><li>C. Peptide linkage</li></ul>	B. D.	Ether linkage All the above
109.	A solution of sodium metal in liquid amn presence of	nonia	is a strong reducing agent due to the
	A. Sodium atoms	Β.	Sodium hydride

C. Sodium amide D. Solvated electrons

110. In which of the following compounds iron has lowest oxidation state?

Α.	$K_4 Fe(CN)_6$	В.	K <sub>2</sub> FeO <sub>4</sub>
C.	Fe <sub>2</sub> O	D.	$Fe(CO)_{5}$

111. When KMnO<sub>4</sub> is reduced with oxalic acid in acidic medium, the oxidation number of Mn changes from

A.	7 to 4	В.	6 to 4
C.	7 to 2	D.	4 to 2

112. When 100 mL of 1 M H<sub>2</sub>SO<sub>4</sub> is mixed with 100 mL of 1 M NaOH solution, the resulting solution will be



113. M is the molecular mass of KMnO<sub>4</sub>. The equivalent mass of KMnO<sub>4</sub> when it is converted into K<sub>2</sub>MnO<sub>4</sub> is



114. What is the concentration of  $NO_3^-$  ions if equal volumes of 0.1 M AgNO<sub>3</sub> and 0.1 M NaCl solutions are mixed together? A = 0.1 M = 0.2 M

Α.	0.1 M	В.	0.2 M

C. 0.05 M D. 0.25 M

115. Electromagnetic radiation with maximum wavelength is

- A.UltravioletB.RadiowaveC.X-RayD.Infrared
- 116. Any p-orbital can accommodate up to
  - A. Four electrons
  - C. Two electrons with parallel spin
- B. Six electrons
- D. Two electrons with opposite spin

- 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	В.	4d
C.	55	D.	4f

119. The number of neutrons in the parent nucleus which gives <sup>14</sup>N on beta emission is

	A.	6	Β.	7		
	C.	8	D.	14		
20.	The compound which contains both ionic and covalent bonds is					
	А.	CH,	В.	Н,		
	C.	KCN	D	ĸĊI		
121.	BF <sub>3</sub>	is a/an		( =		
	A. C.	Electron deficient compound Lewis base	B. D.	Ionic compound Coordinate compound		
122.	The is	temperature at which a real gas obeys the	idea	l gas laws over a wide range of pressure		
	A.	Critical temperature	B.	Boyle's temperature		
	C.	Inversion temperature	D.	Reduced temperature		
123.	Rate	e of diffusion of a gas is		.e.		
	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