

9. If the net force acting on a body is doubled, then acceleration of the body is
- a) Halved
b) Doubled
c) Unchanged
d) Tripled []
10. A scooter of mass 120 kg is moving with uniform velocity of 108 km/hr. The force required to stop the vehicle in 10 seconds is
- a) 180 N b) 360 N c) 720 N d) 820 N []
11. Chose correct statement from the following :
- a) When a conservative force does positive work on body, its potential energy increases
b) When a body does work against the friction , its kinetic energy decreases
c) The rate of change of total momentum of a many particle system is proportional to the net external force acting on the system
d) The rate of change of total momentum of a many particle system is proportional to the net internal force acting on the system []
12. Two bodies 'A' and 'B' having masses in the ratio of 1:2 fall from heights in the ratio 1:2 respectively . The ratio of their potential energy is
- a) 1:2 b) 2:1 c) 1:4 d) 4:1 []
13. Two springs have their force constants K_1 and K_2 . Both are stretched till their elastic energies are equal. Then the ratio of stretching forces $\frac{F_1}{F_2}$ equal to
- a) $\frac{K_1}{K_2}$ b) $\frac{K_2}{K_1}$ c) $\frac{\sqrt{K_1}}{\sqrt{K_2}}$ d) $\frac{K_1^2}{K_2^2}$ []
14. A body is moving with uniform acceleration 'a' on a horizontal surface which has coefficient of friction ' μ ' as it is pulled with horizontal force. When the body moves on a horizontal surface of coefficient of friction of ' 2μ ', its acceleration is halved under the same force. Then the acceleration 'a' is
- a) μg b) $2\mu g$ c) $\frac{\mu g}{2}$ d) $\frac{\mu g}{4}$ []

15. The moment of inertia of a body is independent of the following factor
- a) The angular speed
 - b) Mass of the body
 - c) Nature of the distribution of the mass
 - d) Location of the axis of rotation
- []
16. Which of the following has the highest moment of inertia when each of them has the same mass and same radius
- a) A solid sphere about one of its diameter
 - b) A spherical shell about one of its diameter
 - c) A disc about its axis perpendicular to the plane of disc
 - d) A ring about its axis perpendicular to the plane of the disc
- []
17. The gravitational force between two bodies is 'F'. When the mass of each body is doubled and the distance between them is halved, then the force between them will be
- a) F
 - b) 4F
 - c) 8F
 - d) 16 F
- []
18. The escape velocity of earth is 11.2 km/sec. If the earth is compressed to half of its radius, then the escape velocity
- a) Remains the same
 - b) Increases
 - c) Decreases
 - d) Depends on the mass of the body
- []
19. Two samples A and B of a gas initially of the same temperature and pressure are compressed from a volume V to a volume $\frac{V}{2}$ such that A is compressed isothermally and B adiabatically. Then the final pressure of
- a) A is greater than that of B
 - b) A is equal to that of B
 - c) A is less than that of B
 - d) Relation between A and B can not be defined
- []
20. Three liquids A, B, C of masses 200 g, 300 g, 400 g, are at 30 °C, 40 °C and 50 °C respectively. When A and B are mixed the resultant temperature is 32 °C. When B and C are mixed the resultant temperature is 45 °C. The resultant temperature when A and C are mixed is :
- a) 34 °C
 - b) 45 °C
 - c) 40 °C
 - d) 42 °C
- []

21. A gas is compressed adiabatically and its temperature rises by T_1 . If it is compressed isothermally and change in temperature is denoted by T_2 . Then the valid statement among the following is
- a) $T_1 = T_2$ b) $T_2 = 0$ c) $T_1 = 0$ d) $T_1 < T_2$ []
22. First law of thermodynamics states that
- a) system can do work
 b) system has temperature
 c) system has pressure
 d) heat is form of energy []
23. A gas for which $\gamma = 1.5$ is suddenly compressed to $\frac{1}{4}$ th of its initial value, then the ratio of the final to initial pressure is
- a) 1: 16 b) 1: 8 c) 1: 4 d) 8:1 []
24. The internal energy of an ideal gas depends upon the following factor
- a) Temperature
 b) Pressure
 c) Specific volume
 d) Color []
25. The ratio of emissive power and the absorptive power of all bodies is the same and is equal to the emissive power of a perfectly blackbody is known as
- a) Newton's law
 b) Kirchhoff's law
 c) Wien's law
 d) Stefan's law []
26. If the difference between lengths of rods of steel and brass are to remain constant at 30 cm at all temperatures, then their lengths at 0 °C should be respectively (given parameters $\alpha_s = 11 \times 10^{-6} / ^\circ\text{C}$; $\alpha_b = 19 \times 10^{-6} / ^\circ\text{C}$)
- a) 71.25 cm and 41,25 cm
 b) 82 cm and 52 cm
 c) 72 cm and 52 cm
 d) 61.25 cm and 31.25 cm []
27. In a mercury thermo meter the lower fixed point and the upper fixed point are separated by 200 mm. When the length of the mercury column is 50 mm, then the temperature reading in Celsius is
- a) 50 °C b) 75 °C c) 25 °C d) 10 °C []

28. Quickly changing temperatures are measured by the following instrument:
- Gas thermometers
 - Vapor pressure thermometers
 - Pyrometers
 - Thermocouple thermometers
- []
29. Young's modulus of the wire has the same units as
- Pressure
 - Strain
 - Compressibility
 - Energy
- []
30. Young's modulus of the steel is 2.0×10^{11} Pa and its Poisson's constant is 0.2, then its bulk modulus is
- 1.1×10^{11} Pa
 - 1.1×10^{10} Pa
 - 1.1×10^9 Pa
 - 1.1×10^8 Pa
- []
31. Two tooth pricks are floating very near and parallel to each other on the surface of the water. If a third prick is submerged in solution of detergent is touched with the water between the floating pricks, then the pricks are
- First touched and then repelled
 - Come closer
 - Remain in same position
 - Moves further away
- []
32. The surface tension of a soap solution is T. The work done in increasing the diameter of soap bubble from D to 2D will be
- $8\pi D^2 t$
 - $6\pi D^2 t$
 - $4\pi D^2 t$
 - $2\pi D^2 t$
- []
33. Depth of the water at which air bubble of radius 0.4 mm remain in equilibrium is (given parameters surface tension of water = 72×10^{-3} N/m and $g = 9.8$ m/sec²)
- 3.674 m
 - 36.74 cm
 - 3.674 cm
 - 36.74 m
- []

34. Which of the following statement is not correct
- a) Lines of force are parallel to the equi-potential surface
 - b) Lines of force are perpendicular to the equi-potential surface
 - c) On an equipotential surface, work done in moving a charge is zero
 - d) Equipotential surfaces do not intersect []
35. Charges of $+100 \mu\text{C}$ and $-100 \mu\text{C}$ are placed at A and B of an equilateral triangle of side 10 cm. The intensity at the other corner 'C' is
- a) $3 \times 10^7 \text{ NC}^{-1}$
 - b) $4 \times 10^7 \text{ NC}^{-1}$
 - c) $5 \times 10^7 \text{ NC}^{-1}$
 - d) $9 \times 10^7 \text{ NC}^{-1}$ []
36. A mica condenser has 51 plates. If the capacity between adjacent plates is 2 pF. Then its total capacity is
- a) 50 pF
 - b) 100 pF
 - c) 150 pF
 - d) 200 pF []
37. At any point on the right bisector of line joining two equal and opposite charges :
- a) The electric field is zero
 - b) The electric potential is zero
 - c) The electric potential decreases with increasing distance from the center
 - d) The electric field is perpendicular to the line joining the charges []
38. At 30°C the resistance of a conductor is 5 ohm. The temperature at which the resistance becomes 5.2 ohm is (given that temperature coefficient of resistance is $= 0.001^\circ\text{C}$)
- a) 71°C b) 70°C c) 100°C d) 41°C []
39. Two cells of emf 12 V and 2 V having internal resistances 2 ohm and 1 ohm respectively are connected in parallel with an external resistance 'R'. If the current through R is 0.5 A. Then the value of R is
- a) 10 ohm b) 5 ohm c) 20 ohm d) 15 ohm []

40. Which of the following two statements are true
- A: Thomson effect is due to non-uniform electron density in the metal due to temperature variation along it
- B: Peltier effect is due to non-uniform electron density of the metals at junction
- a) A only true
 b) B only true
 c) Both A and B true
 d) Neither A nor B true []
41. Two identical short bar magnets each having a magnetic moment 'M' are placed at a distance of '2d' with their axes perpendicular to each other in horizontal plane. The magnetic field induction at a point mid way between them is
- a) $\frac{\mu_0}{4\pi} (\sqrt{2}) \frac{M}{d^3}$
 b) $\frac{\mu_0}{4\pi} (\sqrt{3}) \frac{M}{d^3}$
 c) $\frac{2\mu_0}{\pi} \frac{M}{d^3}$
 d) $\frac{\mu_0}{4\pi} (\sqrt{5}) \frac{M}{d^3}$ []
42. When a material is placed in a magnetic field B, then the magnetic moment proportional to 'B', but opposite in the direction is induced. The material is
- a) Diamagnetic
 b) Paramagnetic
 c) Ferromagnetic
 d) Antiferro []
43. The magnet of a vibration magnetometer is heated so as to reduce its magnetic moment by 19%. By doing this the periodic time of the magnetometer will
- a) Increase by 19%
 b) Increase by 11%
 c) Decrease by 19%
 d) Decrease by 21% []
44. If a long copper wire rod carries a direct current, then the magnetic field associated with the current will be
- a) Only inside the rod
 b) Only outside the rod
 c) Both inside and outside the rod
 d) Neither inside nor outside the rod []

45. A 10 turn circular coil of radius 2 cm carries a current of 0.5 amp. Then the magnetic induction at the center of the coil is
- a) 1.57×10^{-6} tesla
 - b) 1.57×10^{-5} tesla
 - c) 1.57×10^{-4} tesla
 - d) 1.57×10^{-6} tesla
- []

46. Two SHMs are represented as $x = a \sin \omega t$ and $y = a \cos \omega t$, where x and y are perpendicular to each other. The resultant motion is
- a) Circular
 - b) Parabola
 - c) Straight line
 - d) Hyperbola
- []

47. A body moves between two points A and B which are distant 'a' and 'b' from the point O in the same straight line OAB. Then the amplitude is
- a) $\frac{a+b}{2}$
 - b) $\frac{\sqrt{a^2+b^2}}{2}$
 - c) $\frac{b-a}{2}$
 - d) $(b-a)$

48. When an aero-plane attains a speed higher than the velocity of sound in air, a loud bang is heard. This is because
- a) It explodes
 - b) It produces a shock wave which is received as the bang
 - c) Its wings vibrates so violently that bang is heard
 - d) The normal engine noises undergo a Doppler shift to generate bang
- []

49. The velocity of progressive wave which produces the stationary wave $y = 2 \sin \left(\frac{\pi x}{100} \cos(\pi t) \right)$ is
- a) 100 ms^{-1}
 - b) 50 ms^{-1}
 - c) 1 ms^{-1}
 - d) 1000 ms^{-1}
- []

50. A plano-convex lens of refractive index ' μ ' and radius of curvature 'R' is silvered on the plane surface. Then it behaves as
- a) A concave mirror of focal length $\frac{R}{2\mu}$
 - b) A convex mirror of focal length $\frac{R}{2(\mu-1)}$
 - c) A concave mirror of focal length $\frac{R}{2(\mu-1)}$
 - d) A converging lens of focal length $\frac{R}{(\mu-1)}$
- []

51. Consider the following two statements and identify the correct answer

A: Spherical mirrors of large aperture are free from chromatic aberration

B: Plane mirrors are free from both spherical and chromatic aberrations

- a) A is true but B is false
- b) A is false but B is true
- c) Both A and B are true
- d) Both A and B are false

[]

52. The property of light waves are

- a) Transverse mechanical waves
- b) Longitudinal electromagnetic waves
- c) Transverse electromagnetic waves
- d) Longitudinal mechanical waves

[]

53. When two coherent sources of amplitude 'a' interfere at a point with a phase difference 'φ', then the intensity at that point is proportional to

- a) $a^2 \cos^2 \phi$
- b) $\frac{a^2 \cos^2 \phi}{2}$
- c) $a^2 \cos^2 \frac{\phi}{2}$
- d) $a^2 \sin^2 \frac{\phi}{2}$

[]

54. In a Young's double slit experiment green light ($\lambda = 5461 \text{ \AA}$) is used and 60 fringes were seen in the field of view. No sodium light is used ($\lambda = 5890 \text{ \AA}$), then the number of fringes observed are

- a) 40
- b) 60
- c) 50
- d) 55

[]

55. Identify correct answer by checking the following statements

A: Mobility of electrons is greater than that of holes in Ge by two times

B: Mobility of electrons is greater than that of holes in Si by four times

- a) Both A and B are correct
- b) Both A and B are wrong
- c) A is correct but B is wrong
- d) A is wrong but B is correct

[]

56. In a pn junction the thickness of the depletion layer is of the order of

- a) Meter
- b) centimeter
- c) millimeter
- d) micrometer

[]

57. The value indicated by Fermi energy level in an intrinsic semiconductor is

- a) The average energy of electron and holes
- b) The energy of electron in conduction band
- c) The energy of holes in valence
- d) The energy of forbidden region

[]

58. The phenomena of nuclear fission can be understood on the basis of the following model
- a) Liquid drop
 - b) Shell model
 - c) α -particle model
 - d) collective model
- []
59. The amount of energy released during the nuclear fusion of four protons combining into He nucleus is
- a) 200 MeV
 - b) 26.7 MeV
 - c) 8.8 MeV
 - d) 8.0 MeV
- []
60. Among the following which physical quantity is the same for all observers in uniform motion
- a) Speed of light
 - b) Acceleration
 - c) Time
 - d) Velocity
- []

+2 CHEMISTRY

61. The number of unpaired electrons present in the complex ion $[\text{CoCl}_4]^{2-}$ is

A. 3	B. 2
C. 4	D. 0

62. Amongst Na_2O , CaO , BaO and ZnO , the amphoteric oxide is

A. Na_2O	B. ZnO
C. CaO	D. BaO

63. The hybridization, geometry and magnetic moment of $\text{Na}_2[\text{Cu}(\text{CN})_4]$ respectively, are

A. sp^3 , tetrahedral, 1.73 B.M.	B. sp^3 , tetrahedral, 2.84 B.M.
C. dsp^2 , square planar, 1.73 B.M.	D. dsp^2 , square planar, 2.84 B.M.

64. Reaction of water with aluminium carbide gives a colorless gas. The gas is

A. acetylene	B. propene
C. propane	D. methane

65. The number lone pairs on the central atom of the following molecules respectively, are

XeCl_2 , XeF_4 , SF_4 , ClF_3

A. 3, 2, 1, 2	B. 2, 3, 1, 2
C. 3, 2, 2, 1	D. 1, 2, 1, 3

66. The most stable isotope of copper and the number of neutrons present in its nucleus are, respectively

A. ^{65}Cu , 36	B. ^{63}Cu , 34
C. ^{67}Cu , 34	D. ^{63}Cu , 32

67. Hemoglobin (MW 67200) contains 0.334% of iron (55.85) by weight. In one molecule of hemoglobin the number of iron atoms present is

A. 6	B. 2
C. 4	D. 1

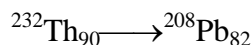
68. One mole of $\text{Co}(\text{NH}_3)_5\text{Cl}_3$ gives 3 moles of ions on dissolution in water. One mole of the complex reacts with two moles of AgNO_3 in solution to give 2 moles of AgCl (s). The correct formula of the complex is

A. $[\text{Co}(\text{NH}_3)_3\text{Cl}_3] \cdot 2\text{NH}_3$	B. $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl} \cdot \text{NH}_3$
C. $[\text{Co}(\text{NH}_3)_4\text{Cl}]\text{Cl}_2 \cdot 2\text{NH}_3$	D. $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$

69. A positron is emitted from $^{23}\text{Na}_{11}$. The ratio of the atomic mass and atomic number of the resulting nuclide is

A. 23/10	B. 22/10
C. 23/12	D. 22/11

70. For the following radioactive decay



the correct disintegration series is

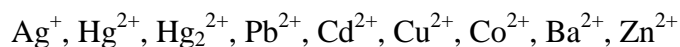
A. $4n+1$	B. $4n$
C. $4n+2$	D. $4n+3$

71. From the activity series of metals identify the correct set of metals which produce hydrogen from reaction with steam

Ba, Ca, Al, Zn, Cd, Sn, Ni, Co, Pb

A. Ba, Ca, Sn	B. Cd, Sn, Ni
C. Al, Zn, Cd	D. Ni, Co, Pb

72. The correct set of ions from the following



gives insoluble precipitate by addition of dilute HCl solution is

A. $\text{Pb}^{2+}, \text{Cd}^{2+}, \text{Cu}^{2+}$	B. $\text{Co}^{2+}, \text{Ba}^{2+}, \text{Zn}^{2+}$
C. $\text{Ag}^+, \text{Cd}^{2+}, \text{Ba}^{2+}$	D. $\text{Ag}^+, \text{Hg}_2^{2+}, \text{Pb}^{2+}$

73. Identify the buffer system from the following pairs



A. $\text{KH}_2\text{PO}_4/\text{H}_3\text{PO}_4$	B. $\text{NaClO}_4/\text{HClO}_4$
C. KF/HF	D. KBr/HBr

74. In dry condition orange-yellow solid CsO_2 is quite stable. Upon dissolution in water it gives

A. O_2^{2-} and HO^-	B. O_2 and HO^-
C. O_2^{2-} and O^{2-}	D. O_2 and O^{2-}

75. The complex $\text{Na}_5[\text{Ag}(\text{S}_2\text{O}_3)_3]$ has

A. two Ag–S and one Ag–O bond	B. two Ag–S and one Ag–O bond
C. three Ag–S bonds	D. three Ag–O bonds

76. The magnetic moment of green $\text{K}_n[\text{VF}_6]$ is $2.79 \mu_B$ at 300K. The value of value of 'n' in the formula is

A. 4	B. 2
C. 1	D. 3

77. Thermal decomposition of $(\text{NH}_4)_2[\text{Cr}_2\text{O}_7]$ gives

A. green pigment Cr_2O_3 and N_2	B. green pigment Cr_2O_3 and N_2O
C. red pigment CrO_3 and N_2	D. brown pigment CrO and NO_2

78. Extraction of silver metal from its ore argentite using NaCN and Zn produced species like

A. $\text{Na}_2[\text{Ag}(\text{CN})_3]$ and $\text{Na}_2[\text{Zn}(\text{CN})_4]$	B. $\text{Na}[\text{Ag}(\text{CN})_2]$ and $\text{Na}_2[\text{Zn}(\text{CN})_4]$
C. $\text{Na}[\text{Ag}(\text{CN})_2]$ and $\text{Na}[\text{Zn}(\text{CN})_3]$	D. $\text{Na}_2[\text{Ag}(\text{CN})_4]$ and $\text{Na}_4[\text{Zn}(\text{CN})_6]$

79. Identify the correct pair of amphoteric oxides from the following

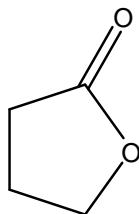
Rb_2O , BeO , Al_2O_3 , As_2O_5

A. Rb_2O , BeO	B. Rb_2O , As_2O_5
C. BeO , Al_2O_3	D. Al_2O_3 , As_2O_5

80. The metal based effective drug for certain types of cancer is

A. facplatin	B. transplatin
C. merplatin	D. cisplatin

81. The following compound is popularly known as



A. a lactone	B. an aldehyde
C. a ketal	D. cyclic hemiacetal

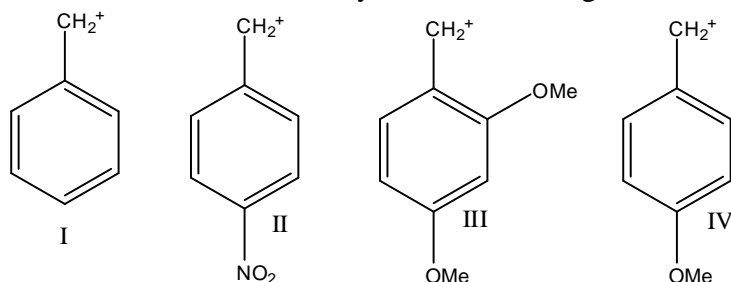
82. Which of the following pair can be distinguished by iodoform test?

A. Acetone and acetophenone	B. Acetophenone and benzophenone
C. Acetone and 2-butanone	D. Acetone and 2-pentanone

83. Which of the following will not undergo aldol condensation reaction?

A. 2,2,4,4-tetramethylpentan-3-one	B. acetaldehyde
C. acetone	D. acetophenone

84. The correct order of the stability for the following carbocations is



A. III>II>IV>I	B. III>IV>I>II
C. III>II>I>IV	D. III>I>II>IV

85. Which of the following exhibits aromaticity according to Huckel rule?

A.	B.
C.	D.

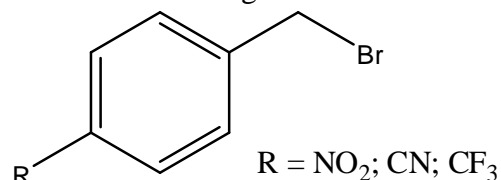
86. A positive carbylamine test is given by

A. N,N-dimethylaniline	B. N-methylaniline
C. 4-Methyl-aniline	D. N-Methyl-N-ethyl-aniline

87. Nitrogen is estimated in organic compounds by

A. Carius method	B. Duma's method
C. Kjeldahl's method	D. Both B & C

88. Which of the following statement is true about the following compounds?



A. All the substrates react in S_N1 fashion	B. All the substrates react in S_N2 fashion
C. All the substrates can react in either S_N1 or S_N2 fashion depending on experimental condition	D. None of the above.

89. Which of the following amino acid is having a phenolic-OH group in its structure?

A. Tyrosine	B. Phenylalanine
C. Histidine	D. Tryptophan

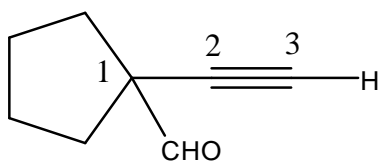
90. Which of the following hydrocarbon cannot be synthesized by Kolbe's electrolytic method?

A. Ethane	B. n-Butane
C. n-Hexane	D. n-Propane

91. The pyrimidine nucleobase "Uracil" is found only in

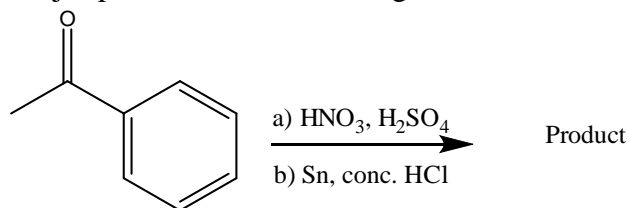
A. DNA	B. RNA
C. Both in DNA & RNA	D. PNA

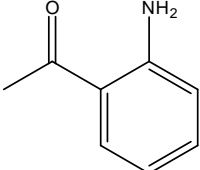
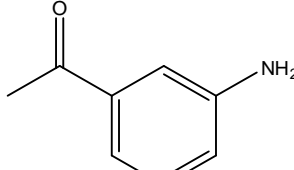
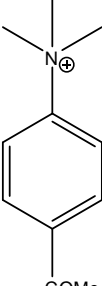
92. One of the carbon atom in the following molecule is nucleophilic in nature and will be attacked by some electrophilic species under certain reaction condition, identify the nucleophilic carbon atom?



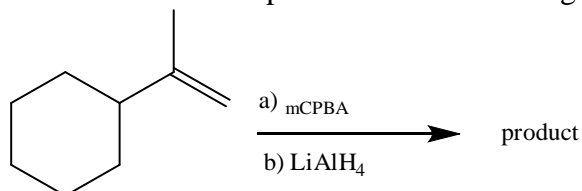
A. C-1	B. C-2
C. C-3	D. None

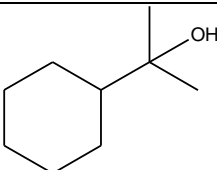
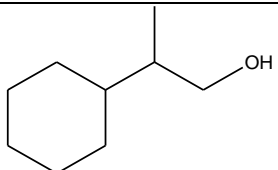
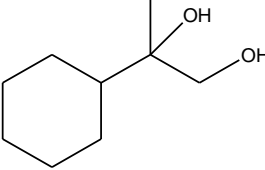
93. The major product in the following reaction will be?



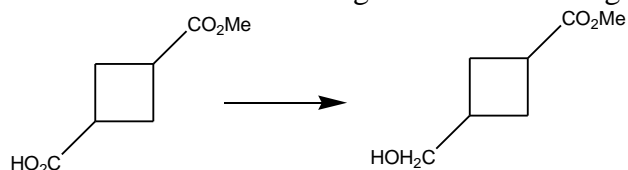
<p>A. </p>	<p>B. </p>
<p>C. </p>	<p>D. None</p>

94. Which will be the main product in the following reaction?



<p>A. </p>	<p>B. </p>
<p>C. </p>	<p>D. None</p>

95. Which will be the selective reagent in the following transformation?

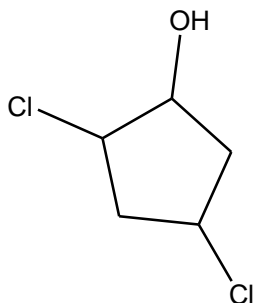


<p>A. LiAlH_4</p>	<p>B. NaBH_4</p>
<p>C. BH_3</p>	<p>D. Ni-H_2</p>

96. The monomer used to produce **orlon** is

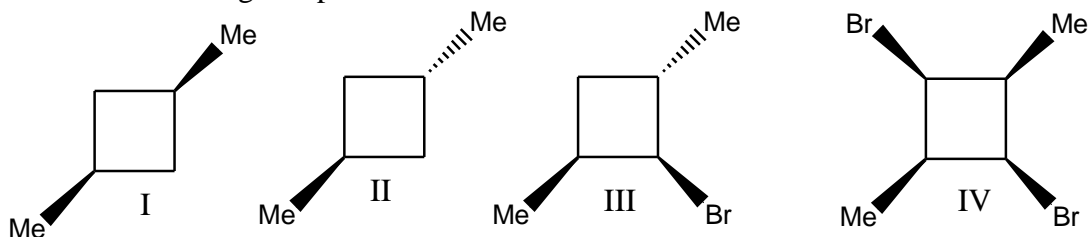
A. Acrylo nitrile	B. Vinyl bromide
C. Vinyl chloride	D. Vinyl fluoride

97. The IUPAC name of the following compound is



A. 3,5-dichlorocyclopentan-1-ol	B. 2,4- dichlorocyclopentan-1-ol
C. 1,4- dichlorocyclopentan-2-ol	D. 1,3- dichlorocyclopentan-4-ol

98. Which of the following compound is chiral



A. I	B. II
C. III	D. IV

99. Increasing order of acidic strength among phenol, *para*-cresol, *para*-nitrophenol and 2,4-dinitro phenol is

A. <i>para</i> -cresol < phenol < 2,4-dinitrophenol < <i>para</i> -nitrophenol	B. <i>para</i> -cresol < phenol < <i>para</i> -nitrophenol < 2,4-dinitrophenol
C. phenol < <i>para</i> -cresol < <i>para</i> -nitrophenol < 2,4-dinitrophenol	D. <i>para</i> -nitrophenol < 2,4-dinitrophenol < <i>para</i> -cresol < phenol

100. The reaction of sodium ethoxide with *tert*-butyl bromide gives

A. <i>tert</i> -butyl methyl ethyl ether	B. 1-butene
C. 2-methyl propene	D. None

101. Above critical temperature

A. a gas behaves ideally	B. no distinct vapor and liquid phase exist
C. the vapor liquifies	D. the liquid vaporizes

102. If the density of an ideal gas is given by 'd', then which of the following expressions is equal to molecular weight?

A. dRT/P	B. $nRTP/d$
C. Pd/RT	D. RTP/d

103. The root mean square velocity of an ideal gas at constant pressure varies with density (d) as

A. \sqrt{d}	B. $\sqrt{1/d}$
C. d^2	D. d

104. Which of the following gas has maximum rate of diffusion at a given temperature

A. O_2	B. H_2
C. CO_2	D. NH_3

105. Which of the following are extensive properties of a system?

i) Boiling point ii) Viscosity iii) pH iv) Standard Emf of a cell (E°)

A. i, ii & iii	B. iv
C. iii & iv	D. None

106. The boiling point of an azeotropic mixture of water and ethanol is less than that of water and ethanol. The mixture shows

A. positive deviation from Raoult's Law	B. negative deviation from Raoult's Law
C. no deviation from Raoult's Law	D. deviations which cannot be predicted from the given information

107. Temperature of one mole of neon (Ne) gas is increased by 1°C, hence, increase in internal energy is

A. 5 cal	B. 3 cal
C. 9 cal	D. 2 cal

108. Consider the following gas-phase reaction: $O_3 + 2NO_2 \rightarrow N_2O_5 + O_2$; The value of the rate constant at 35 °C is $3.0 \times 10^4 \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$. What is the order of this reaction at 35 °C.

A. 0	B. 1
C. 2	D. 3

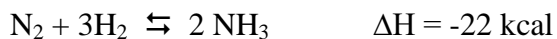
109. Consider the following reaction: $N_2 + 3H_2 \rightarrow 2NH_3$; the rate of change of concentration of N_2 , $\frac{d[N_2]}{dt}$ at any instant is $-0.002 \text{ mol L}^{-1} \text{ s}^{-1}$. What is the value of $\frac{d[H_2]}{dt}$ at that particular instant?

A. $-0.002 \text{ mol L}^{-1} \text{ s}^{-1}$	B. $-0.004 \text{ mol L}^{-1} \text{ s}^{-1}$
C. $-0.006 \text{ mol L}^{-1} \text{ s}^{-1}$.	D. $-0.008 \text{ mol L}^{-1} \text{ s}^{-1}$

110. The plot of $\log k$ vs. $1/T$ of a reaction is linear with a

A. negative slope and non-zero intercept	B. positive slope and non-zero intercept
C. negative slope and zero intercept	D. positive slope and zero intercept

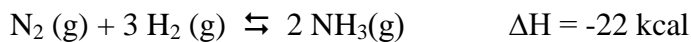
111. In the reaction



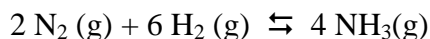
the favorable condition for formation of NH_3 in good yield is

A. High Temperature and Low Pressure	B. Low Temperature and High Pressure
C. Low Temperature and Low Pressure	D. High Temperature and High Pressure

112. The equilibrium constant for the following reaction at 25 °C is K.



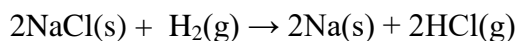
What is the value of equilibrium constant for the following reaction at 25 °C



A. \sqrt{K}	B. K^2
C. K^{-1}	D. K

113. For the following reaction $\text{Na}(\text{s}) + \text{HCl}(\text{g}) \rightarrow \text{NaCl}(\text{s}) + 1/2 \text{H}_2(\text{g})$, standard enthalpy of reaction ($\Delta_r H^0$) at 25 °C is -319 kJ mol^{-1} .

The $\Delta_r H^0$ for the following reaction is



A. 319 kJ mol^{-1}	B. -319 kJ mol^{-1}
C. -638 kJ mol^{-1}	D. 638 kJ mol^{-1}

114. Which one of the following is not an electrolyte

A. NaCl	B. HNO_3
C. KOH	D. CO_2

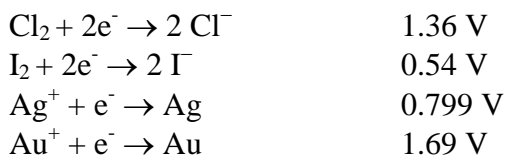
115. At 80 °C the vapour pressure of pure liquid A is 560 mm of Hg and that of pure liquid B is 960 mm of Hg. If a mixture solution of A and B boils at 80 °C and 1 atm pressure, the amount of A in the mixture is

A. 34 mol percent	B. 34 mol percent
C. 50 mol percent	D. 52 mol percent

116. Specific conductance of 0.2 M nitric acid is $0.13 \text{ ohm}^{-1} \text{ cm}^{-1}$. The molar conductance of the solution is

A. $315 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$	B. $6.3 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$
C. $63.0 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$	D. $650 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$

117. Given the following values of standard electrode potentials at 25 °C.



Identify the correct statement.

A. Ag^+ is oxidized by I_2	B. Iodide ion is oxidized by Cl_2
C. Au^+ is oxidized by Cl_2	D. Chloride ion is oxidized by I_2

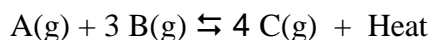
118. Ionic solids with Schottky defects contain in their structure

A. Anion vacancies and interstitial anions	B. Cation vacancies only
C. Cation vacancies and interstitial cations	D. Equal number of cation and anion vacancies

119. A certain heat engine operates between 727 °C and 227 °C. What is the maximum efficiency of the engine?

A. 0.31	B. 0.25
C. 0.69	D. 0.50

120. The factor which changes equilibrium constant of the reaction



A. Total pressure	B. Amounts of A and B
C. Temperature	D. Catalyst