Ravi Maths Tuition Centre

Time : 180 Mins **T10 1** **Marks : 686**

1. **Assertion:** Magnetic field lines always form closed loops.
   Reason: Moving charges or currents produce a magnetic field.
   a)
   If both assertion and reason are true and reason is the correct explanation of assertion.
   b)
   If both assertion and reason are true but reason is not the correct explanation of assertion.
   c) If assertion is true but reason is false. d) If both assertion and reason are false.
2. Doubly ionised helium atoms and hydrogen ions are accelerated from rest through the same potential drop. The ratio of the final velocities of the helium and the hydrogen ion is _____
   a) $\frac{1}{2}$ b) 2 c) $\frac{1}{\sqrt{2}}$ d) $\sqrt{2}$
3. A roller coaster is designed such that riders experience "weightlessness" as they go round the top of a hill whose radius of curvature is 20 m. The speed of the car at the top of the hill is between _____.
   a) 14 m/s and 15 m/s b) 15 m/s and 16 m/s c) 16 m/s and 17 m/s
   d) 13 m/s and 14 m/s
4. The mass of a box measured by a grocer's balance is 2.3 kg. Two gold pieces of masses 20.15 g and 20.17 g are added to the box. The total mass of the box is
   a) 2.3 kg b) 2.34 kg c) 2.340 kg d) 2.3403 kg
5. Two turning forks of frequencies n_1 and n_2 produces n beats per second. If n_2 and n are known, n_1 may be given by
   a) $\frac{n_2}{n} + n_2$ b) $n_2 n$ c) $n_2 \pm n$ d) $\frac{n_2}{n} - n_2$
6. The range of masses we study in Physics is
   a) 10^{-27} kg to 10^{60} kg b) 10^{-27} kg to 10^{55} kg c) 10^{-30} kg to 10^{55} kg
   d) 10^{-30} kg to 10^{60} kg
7. A light year is a unit of:
   a) time b) distance c) speed d) year
8. If a body describes a circular motion under inverse square field, the time taken to complete one revolution T is related to the radius of the circularm orbit as :
   a) $T \propto r$ b) $T \propto r^2$ c) $T^2 \propto y^3$ d) $T \propto r^4$

9. A steel rod of length 1m and radius 10mm is stretched by a force 100 kN along its length. The stress produced in the rod is $Y_{Steel} = 2 \times 10^{11}$ Nm^{-2} .
   a) 3.18×10^{6} Nm^{-2} b) 3.18×10^{7} Nm^{-2} c) 3.18×10^{8} Nm^{-2} d) 3.18×10^{9} Nm^{-2}
10. For a gas molecule with 6 degrees of freedom, law of equipartition of energy gives the following relation between the molecular specific heat(C_V)and gas constant(R)
    a) $C_V = \frac{R}{2}$ b) C_V=R c) C_V=2R d) C_V=3R
11. A microscope is focussed on a mark on a piece of paper and then a slab of glass of thickness 3 cm and refractive index 1.5 is placed over the mark. How should the microscope be moved to get the mark in focus again?
    a) 4.5 cm downward b) 1 cm downward c) 2 cm upward d) 1 cm upward
12. A spring is compressed between two toy carts of masses m_1 and m_2. When the toy carts are released the spring exerts on each toy cart equal and opposite forces for the same time t. If the coefficients of friction J.I between the ground and the toy carts are equal, then the displacements of the toy carts are in the ratio
    a) $\frac{s_1}{s_2} = \frac{m_2}{m_1}$ b) $\frac{s_1}{s_2} = \frac{m_1}{m_2}$ c) $\frac{s_1}{s_2} = \left(\frac{m_2}{m_1}\right)^2$ d) $\frac{s_1}{s_2} = \left(\frac{m_1}{m_2}\right)^2$
13. Water is flowing through a horizontal pipe of varying cross-section. If the pressure of water equals 2 cm of mercury, where the velocity of the flow is 32 cm s^{-1}. what is the pressure at another point, where the velocity of flow is 65 cm s^{-1}?
    a) 1.02 cm of Hg b) 1.88 cm of Hg c) 2.42 cm of Hg d) 1.45 cm of Hg
14. In a radioactive decay process, the negatively charged emitted β-particles are _____ .
    a) The electrons produced as a result of the decay of neutrons inside the nucleus
    b) The electrons produced as a result of collisions between atoms
    c) The electronics orbiting around the nucleus
    d) The electrons present inside the nucleus
15. A divergent lens is one which
    a) Collect rays b) Spreads rays c) Forms real image
    d) Neither collects nor spreads rays
16. A refrigerator works between 4°C and 30°C. It is required to remove 600 calories of heat every second in order to keep the temperature of the refrigerated space constant. The power required is [Take 1 cal = 4.2 joules)
    a) 236.5 W b) 2365 W c) 2.365 W d) 23.65 W
17. If a lens is cut into two pieces perpendicular to the principal axis and only one part is used, the new focal length
    a) Remains same b) Becomes 1/2 time c) Becomes 2 time d) Infinite
18. A spherical body falling through a viscous liquid of infinite extent ultimately attains a constant value, when:
    a) upthrust + weight = viscous drag b) weight + viscous drag = upthrust
    c) viscous drag + upthrust = weight d) viscous drag + upthrust > weight

19. The cylindrical tube of a spray pump has a cross-section of 6 cm^2, one of which has 50 holes each of diameter Imm. If the liquid flow inside the tube is 1.2 m per minute, then the speed of ejection of the liquid through the holes is :
    a) 2.1 ms^{-1} b) 0.31 ms^{-1} c) 0.96 ms^{-1} d) 3.4 ms^{-1}

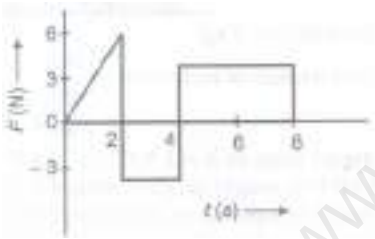
20. Which of the following statements is correct regarding the universal gravitational constant G?
    a) G has same value in all systems of units.
    b) The value of G is same everywhere in the universe
    c) The value of G was first experimentally determined by Johannes Kepler
    d) G is a vector quantity

21. Unit of magnetic flux density (or magnetic induction) is :
    a) Tesla b) Weber/$metre^2$ c) Newton/ampere-metre d) All of the above

22. The range of a projectile fired at an angle of 15° is 50 m. If it is fired with the same speed at an angle of 45°, its range will be:
    a) 50 m b) 100 m c) 25 m d) 37 m

23. The density of a substance at 0^0C is 10g/cc and at 100^0C, its density is 9.7 g/cc The coefficient of linear expansion of the substance is
    a) $10^{-4}\ ^0C^{-1}$ b) $10^{-2}\ ^0C^{-1}$ c) $10^{-3}\ ^0C^{-1}$ d) $10^{2}\ ^0C^{-1}$

24. The force 'F' acting on a particle of mass 'm' is indicated by the force-time graph shown below. The change in momentum of the particle over the time interval from zero to 8 s is :



    a) 12 Ns b) 6 Ns c) 24 Ns d) 20 Ns

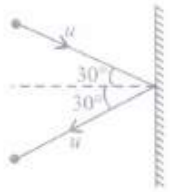
25. A cylinder of mass 10 kg is rolling on a rough plane with a velocity of 10 rn/s. If the coefficient of friction between the surface and cylinder is 0.5, then before stopping, it will cover a distance of: (Take g = 10 M/s^2)
    a) 10 m b) 7.5 m c) 5 m d) 2.5 m

26. The centre of mass of a body
    a) lies always at the geometrical centre b) lies always inside the body
    c) lies always outside the body d) may lie within or outside the body

27. A slit of width a is illuminated by white light. For red light (λ.= 6500Å), the first minima is obtained at θ= 30°. Then the value of a will :
    a) 3250 Å b) 6.5 x 10^{-4} mm c) 1.24 microns d) 2.6 x 10^{-4}

28. An electromagnetic wave radiates outwards from a dipole antenna, with E_0 as the amplitude of its electric field vector. The electric field E_0 which transports Significant energy from the source falls off as
    a) $\frac{1}{r^3}$ b) $\frac{1}{r^2}$ c) $\frac{1}{r}$ d) remains constant.

29. In superconductivity there is production of:
    a) low magnetic fields b) medium magnetic fields c) ultra high magnetic fields
    d) none of these
30. When a ceiling fan is switched on, it makes 10 revolutions in the first 3 seconds. Assuming a uniform angular acceleration, how many rotations it will make in the next 3 seconds?
    a) 10 b) 20 c) 30 d) 40 e) 60
31. Assertion: The gravitational attraction of moon is much less than that of earth.
    Reason: Moon is the natural satellite of the earth.
    a)
    If both assertion and reason are true and reason is the correct explanation of assertion
    b)
    If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false d) If both assertion and reason are false
32. A cube of aluminium of side 0.1m is subjected to a shearing force of 100 N.The top face of the cube is displaced through 0.02 cm with respect to the bottom face. The shearing strain would be
    a) 0.02 b) 0.1 c) 0.005 d) 0.002
33. The moment of inertia about an axis of a body which is rotating with angular velocity 1 radian per second is numerically equal to:
    a) one-fourth of its rotational kinetic energy b) half of the rotational kinetic energy
    c) rotational kinetic energy d) twice the rotational kinetic energy
34. A ball of mass rn strikes a rigid wall with speed u at an angle of 30° and get reflected with the same speed and at the same angle as shown in the figure. If the ball is in contact with the wall for time t, then the force acting on the wall is



    a) $\frac{mu \quad sin30^0}{t}$ b) $\frac{2mu \quad sin30^0}{t}$ c) $\frac{mu \quad cos30^0}{t}$ d) $\frac{2mu \quad cos30^0}{t}$
35. The moment of inertia of a solid sphere of density p and radius R about its diameter is:
    a) $\frac{105}{176}R^5p$ b) $\frac{105}{176}R^2p$ c) $\frac{176}{105}R^5p$ d) $\frac{176}{105}R^2p$
36. The z component of the angular momentum of a particle whose position vector is $\vec{r}$ with components x, y and z and linear momentum is $\vec{P}$ with components P_x ,P_y and p_z is :
    a) $xp_y - yp_z$ b) $yp_z - zp_y$ c) $zp_x - xp_z$ d) $xp_y + yp_x$
37. If the frequency of human heart is 1.25 Hz, the number of heart beats in 1minute is
    a) 65 b) 75 c) 80 d) 90
38. The penetration of light into the region of geometrical shadow is call :

a) Polarization b) Interference c) Diffraction d) Refraction

39. Curie temperature is the temperature above which _____.
    a) ferromagnetic material becomes paramagnetic material
    b) paramagnetic material becomes diamagnetic material
    c) paramagnetic material becomes ferromagnetic material
    d) ferromagnetic material becomes diamagnetic material.

40. In Galilean telescope, the final image formed is
    a) real, inverted and enlarged b) virtual, inverted and enlarged
    c) real, erect and enlarged d) virtual.'erect and enlarged

41. A very flexible uniform chain of mass M and length L is suspended vertically so that its lower end just touches the surface of a table. When the upper end of the chain is released, it falls with each link coming to rest the instant it strikes the table. The force exerted by the chain on the table at the moment when ypart of the chain has already rested on the table is:
    a) $3\frac{M}{L}$yg b) $\frac{M}{L}$yg c) $2\frac{M}{L}$yg d) None of these

42. (A) A coin is placed on phonogram turn table. The motor is started, coin moves along the moving table.
    (R) The rotating table is providing the necessary centripetal force to coin.
    a)
    If both assertion and reason are true and reason is the correct explanation of assertion.
    b)
    If both assertion and reason are true but reason is not the correct explanation of assertion.
    c) If assertion is true but reason is false. d) If both assertion and reason are false.
    e) If assertion is false but reason is true.

43. A parallel plate air capacitor of capacitance C is connected to a cell of emf V and then disconnected from it. A dielectric slab of dielectric constant K, which can just fill the air gap of the capacitor, is now inserted in it Which of the following is incorrect?
    a) The change in energy stored is 1/2 CV^2 (1/K - 1)
    b) The charge on the capacitor is not conserved
    c) The potential difference between the plates decreases K times.
    d) The energy stored in the capacitor decreases K times.

44. The unit of Stefan's constant σ is :
    a) Wm^2K^{-4} b) $Wm^{-2}K^{-4}$ c) $Wm^{-2}K^4$ d) $Wm^{-2}K^{-1}$

45. Let m_p be the mass of a proton, m_n the mass of a neutron, M_1 the mass of a $^{20}_{10}Ne$ nucleus and M_2 the mass of a $^{40}_{20}Ca$ nucleus. Then
    a) $M_2 = M_1$ b) $M_2 > 2M_1$ c) $M_2 < 2M_1$ d) $M_1 < 10 (m_n + m_p)$

46. A ball of mass 2 kg and another of mass 4 kg are dropped together from a 60 feet tall building. After a fall of 30 feet each towards earth, their respective kinetic energies will be in the ratio of

a) $1:\sqrt{2}$ b) $\sqrt{2}:1$ c) 1 : 4 d) 1 : 2

47. (A) The work done during a round trip is always zero.
(R) No force is required to move a body in its round trip.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
e) If assertion is false but reason is true.

48. In a cyclic process, the change in internal energy of a system is:
a) minimum but not zero b) zero c) maximum but not infinite d) infinite

49. In an unbiased p-n junction, holes diffuse from the p-region to n-region because of:
a) The potential difference across the p-n junction
b) The attraction of free electrons of n-region
c) The higher hole concentration in p-region than that in n-region
d) The higher concentration of electrons in the r-region than that in the p-region

50. Two balls A and B of mass 0.10 kg and 0.25 kg respectively are connected by a stretched spring of negligible mass and placed on a smooth table. When the balls are released simultaneously, the initial acceleration of ball B is 10 cm/s^2 westward. The magnitude and direction of acceleration of the ball A are
a) 2.5 cm/sec^2 , westward b) 2.5 cm/sec^2 , eastward c) 25 cm/sec^2 , westward
d) 25 cm/sec^2 , eastward

51. Given below are types of cells present in some animals. Which of the following cells can differentiate to perform different functions?
a) Choanocytes b) Interstitial cells c) Gastrodermal cells d) Nematocytes

52. In mice, Y is the dominant allele for yellow fur and y is the recessive allele for grey fur. Since Y is lethal when homozygous, the result of cross Yy x Yy will be
a) 3 yellow: 1 grey b) 2 yellow: 1 grey c) 1 yellow: 1 grey d) 1 yellow: 2 grey.

53. The Taq polymerase enzyme is obtained from:
a) Thiobacillus ferroxidans b) Bacillus subtilis c) Pseudomonas putida
d) Thermus aquaticus

54. Which pigment system donates e^- for the reduction of NADP
a) PS II b) PS I c) CO_2 d) Plastoquinone

55. Which one of the following population interactions is widely used in medical science for the production of antibiotis?
a) Parasitism b) Mutualism c) Commensalism d) Amensalism

56. Natality refers to____
a) number of individuals leaving the habitat b) birth rate c) death rate
d) number of individuals entering a habitat

57. Acid rains are due to -
a) O_3 b) $SO_2 + NO_2$ c) CO d) CO_2

58. A nitrogen fixing microbe associated with Azole in rice-fields is:-
a) Frankia b) Tolypothrix c) Spirulina d) Anabaena

59. A homopolymer has only one type of building block called monomer repeated 'n' number of times. A heteropolymer has more than one type of monomer Proteins are heteropolymers usually made of:
a) 20 types of monomer b) 40 types of monomer c) 30 types of monomer
d) only one type of monomer

60. Which of the following are not membrane-bound?
a) Ribosomes b) Lysosomes c) Mesosomes d) Vacuoles

61. Fill up the blanks in the following paragraph by selecting the correct option.
During copulation (coitus), semen is released by the penis into the vagina and is called._(i)__ The ovum released by the ovary is transported to the _(ii)__ where _(iii)___takes place. During fertilisation, a sperm comes in contact with the zona pellucida layer of the ovum and induces changes in the membrane that block the entry of _(iv)__. The secretions of the __(v)___ help the sperm enter into the cytoplasm of the ovum.
a)

(i)	(ii)	(iii)	(iv)	(v)
fertilisation	fimbriae	insemination	eggs	middle piece

b)

(i)	(ii)	(iii)	(iv)	(v)
insemination	ampullary isthmic junction	fertilisation	additional sperms	acrosome

c)

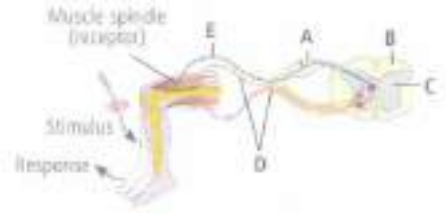
(i)	(ii)	(iii)	(iv)	(v)
ovulation	ampulla	fertilisation	additional sperms	tail

d)

(i)	(ii)	(iii)	(iv)	(v)
parturition	isthmus	insemination	eggs	acrosome

62. Out of the total proposed cost of various ecosystem services, cost of climate regulations and habitat for wildlife are
a) 50% b) 10% c) 6% d) 25%.

63. The given diagrammatic representation of reflex action shows knee jerk reflex.



Identify the parts labelled as A to E and select the correct option.

a)

A	B	C	D	E
Dorsal root ganglion	White matter	Grey matter	Afferent pathway	Efferent pathway

b)

A	B	C	D	E
Dorsal root ganglion	White matter	Grey matter	Efferent pathway	Afferent pathway

c)

A	B	C	D	E
Ventral root ganglion	Grey matter	White matter	Efferent pathway	Afferent pathway

d)

A	B	C	D	E
Ventral root ganglion	White matter	Grey matter	Efferent pathway	Afferent pathway

64. A bundle of muscle fibre is called
a) Fascia b) Glenoid cavity c) Myocyte d) Fasciculus

65. Syngamy means _____ .
a) fusion of gametes b) fusion of cytoplasms c) fusion of two similar spores
d) fusion of two dissimilar spores

66. Select the correct statement regarding parthenocarpy.
a) Formation of fruits without fertilisation
b) Development of seedless fruits as in banana, grapes, navel orange, etc
c) Auxins and gibberellins are used to induce parthenocarpy in different plants
d) All of these

67. Select the correct statement from the ones given below with respeect to dihybrid cross:
a)
Genes loosely linked on the same chromosome show similar recombinatios as the tightly linked ones
b) Tightly linked genes on the same chromosome show very few recombinations
c) Tightly linked genes on the same chromosome show higher recombination
d) Genes far apart on the same chromosome show very few recombinations

68. An anther has 1200 pollen grains. How many PMCs must have been there to produce them?
a) 1200 b) 300 c) 150 d) 2400

69. In tropical rain forest, most of the energy in ecosystem flows through
a) Grazing food chain b) Detritus food chain c) Parasitic food chain
d) Both (1) & (3)

70. **Assertion:** Tropical plants have a higher optimum temperature for photosynthesis than temperate plants.
Reason: The temperature optimum for photosynthesis of different plants depends on their habitat.

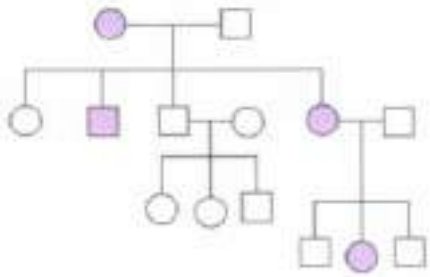
a)
If both assertion and reason are true and reason is the correct explanation of assertion.

b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

71. Which of the following is the vital link that ensures continuity of species between organisms of one generation and the next?
    a) Male gamete b) Female gamete c) Zygote d) Embryo
72. $NADP^+$ is reduced to NADPH in _____ .
    a) HMP b) Calvin cycle c) glycolysis d) EMP
73. A phosphoglycerate is always made up of:
    a)
    Only an unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
    b)
    A saturated or unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
    c)
    A saturated or unsaturated fatty acid esterified to a phosphate group which is also attached to a glycerol molecule.
    d)
    Only a saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
74. If Henle's loop were absent from mammalian nephron, which of the following is to be expected?
    a) The urine will be more dilute b) There will be no urine formation
    c) There will be hardly any change in the quality and quantity of urine formed
    d) The urine will be more concentrated.
75. Cytokinins are mostly
    a) glucosides b) phenolics c) amino purines d) organic acids.
76. Eye of the molluscan group that resembles vertebrate eye is _____ .
    a) Bivalvia b) Gastropoda c) Pelecypoda d) Pelecypoda

77. Study the pedigree chart of a family showing the inheritance of myotonic dystrophy.



The trait under study is

a) dominant X-linked b) recessive X-linked c) autosomal dominant
d) recessive Y-linked

78. Among the following edible fishes, which one is a marine fish having rich source of omega-3-fatty acids?

a) Mystus b) Mangur c) Mrigala d) Mackerel

79. If a diploid cell is treated with colchicine then it becomes _____ .

a) Triploid b) Tetraploid c) Diploid d) Monoploid

80. Select the correct sequence of formation of given intermediates of Krebs' cycle.

a) Succinate $\rightarrow$ Malate $\rightarrow$ Fumarate $\rightarrow$ OAA
b) Fumarate $\rightarrow$ Succinate $\rightarrow$ Malate $\rightarrow$ OAA
c) Succinate $\rightarrow$ Fumarate $\rightarrow$ Malate $\rightarrow$ OAA
d) Malate $\rightarrow$ Fumarate $\rightarrow$ Succinate $\rightarrow$ OAA

81. Which type of white blood cells are concerned with the release of histamine and natural anticoagulant heparin?

a) Monocytes b) Neutrophils c) Basophils d) Eosinophils

82. Bulk CO_2 - fixation occurs in _____.

a) crop plants b) oceans c) tropical rain forests d) temperature forests

83. In which phase of cell cycle the amount of DNA In a diploid cell become four times as compared to a haploid cell?

a) G_1 b) S c) G_2, S & M d) G_0

84. In Flowering plant, archesporium gives rise to

a) Only the wall of the sporangium b) Both wall and the sporogenous cells
c) Wall and the tapetum d) Only tapetum and sporogenous cells

85. Montreal protocol was signed in 1987 for control of _____.

a) Release of Green House Gases b) DisPosal of e-wastes
c) Transport of Genetically modified organisms from one country to another
d) Emission of ozone-depleting substances

86. India and China have more than 70% of world livestock population. However, their contribution to world farm produce is only:

a) 10% b) 25% c) 40% d) 50%.

87. Name the scientists associated with development of Golden Rice

a) Ingo Potrykus and Peter Beyer b) Milstein and Kohler

c) Stanley Miller and Harold Urey d) Stanley Cohen and Herbert Boyer

88. Government of India has provided the private ownership rights for

a) A national park b) A sanctuary c) A biosphere reserve d) Zoo

89. Refer to the given reaction.

$2H_2O \rightarrow 4H^+ + O_2 + 4e^-$

Where does this reaction take place in the chloroplasts of plants?

a) Outer surface of thylakoid membrane b) Inner surface of thylakoid membrane

c) In the matrix (stroma) d) Intermembrane space

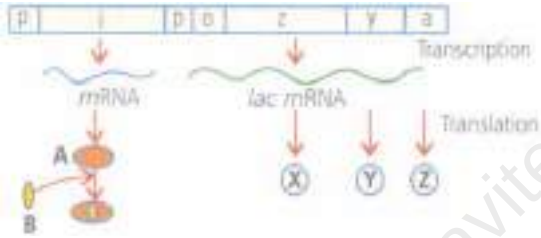
90. How many shoot apical meristems are likely to be present in a twig of a plant possessing 4 branches and 26 leaves?

a) 26 b) 1 c) 5 d) 30

91. Humming birds and hawk illustrate_____

a) convergent evolution b) homology c) adaptive radiation d) parallel evolution

92. The given figure shows lac operon and its functioning. Select the option which correctly labels A, B, X, Y and Z.



a)

A	B	X	Y	Z
Repressor	Inducer	β-galacto-sidase	Permease	Transacetylase

b)

A	B	X	Y	Z
Repressor	Inducer	Permease	β-galacto-sidase	Transacetylase

c)

A	B	X	Y	Z
Inducer	Repressor	β-galacto-sidase	Permease	Transacetylase

d)

A	B	X	Y	Z
Inducer	Repressor	β-galacto-sidase	Transacetylase	Permease

93. Signals for parturition originate from _____

a) Both placenta as well as fully developed foetus

b) Oxytocin released from maternal pituitary c) Ptracenta only

d) Fully developed foetus only

94. Radial symmetry is found in the flowers of :

a) Cassia b) Brassica c) TrifoLium d) Pisum

95. The form of sugar transported through phloem is

a) glucose b) fructose c) sucrose d) ribose.

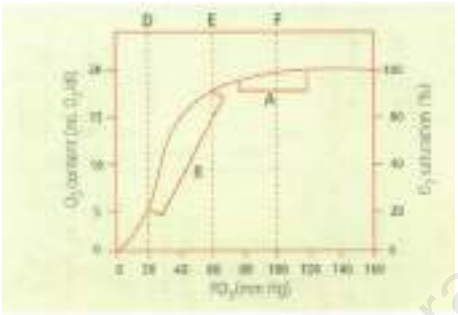
96. Pick the odd one (w.r.t. monoecious plants)
a) Maize b) Ricinus c) Mulberry d) Cucurbits

97. In meiosis , nuclear membrane and nucleolus disappear during ;
a) Zygotene b) Pachytene c) Diakinesis d) Metaphase - I

98. Nitrifying bacteria _____
a) oxidise ammonia to nitrates b) convert free nitrogen to nitrogen compounds
c) convert proteins into ammonia d) reduce nitrates to free nitrogen

99. ADH or vasopressin is _____ .
a) enzyme that hydrolyses peptides
b)
hormone secreted by pituitary that promotes reabsorption of water from glomerular filtrate
c) hormone that promotes glycogenolysis
d) energy rich compound connected with muscle contraction

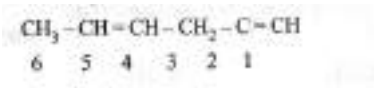
100. Which of these is incorrect regarding A and B in the given graph?



a) A is deoxygenated blood leaving the tissues
b) B is reduced blood returning from tissues.
c) A is oxygenated blood leaving the lungs
d) B is deoxygenated blood in the systemic veins.

101. Electronegativity of carbon atoms depends upon their state of hybrid is at ion. In which of the following compounds, the carbon marked with asterisk is most electronegative?
a) CH_3-CH_2-$\overset{*}{C}H_2$-CH_3 b) CH_3-$\overset{*}{C}H$=CH-CH_3 c) CH_3-CH_2-C$\equiv\overset{*}{C}H$
d) CH_3-CH_2-CH=$\overset{*}{C}H_2$

102. In the hydrocarbon



The state of hybridization of carbons 1, 3 and 5 are in the following sequence
a) sp^2, sp, sp^3 b) sp, sp^3, sp^2 c) sp, sp^2, sp^3 d) sp^3, sp^2, sp

103. Aluminium (III) chloride forms a dimer because Aluminium:
a) Belongs to 3rd group b) Can have higher co-ordination number
c) Cannot form a trimer d) Has high ionization energy

104. Assertion: Rayon is a semi-synthetic polymer and is taken as a better choice than cotton fabric.
Reason: Mechanical and aesthetic properties of cellulose can be improved by acetylation.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

105. As an electron is brought from an infinite distance close of nucleus of the atom, the energy of electron:
a) Increases to a greater +ve value b) Decreases to a smaller +ve value
c) Increases to a greater -ve value. d) Decreases to a smaller -ve value

106. Assertion: Lithium fluoride is most covalent in nature.
Reason: Small anion can be easily distorted.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

107. Which of the following is a condensation polymer?
a) Teflon b) PVC c) Polyester d) Neoprene

108. Drugs that bind to the receptor site and inhibit its natural function are called
a) agonistic drugs b) antagonistic drugs c) antimicrobial drugs d) allosteric drugs

109. The electronic configurations of Eu (Atomic No. 63), Gd (Atomic No. 64) and Tb (Atomic No. 65) are:
a) $[Xe]4f^6\ 5d^1\ 6s^2$, $[Xe]4f^7\ 5d^1\ 6s^2$ and $[Xe]4f^8\ 5d^1\ 6s^2$
b) $[Xe]4f^7\ 6s^2$, $[Xe]4f^7\ 5d^1\ 6s^2$and $[Xe]4f^9\ 6s^2$
c) $[Xe]4f^7\ 6s^2$, $[Xe]4f^8\ 6s^2$ and $[Xe]4f^8\ 5d^1\ 6s^2$
d) $[Xe]4f^6\ 5d^1\ 6s^2$, $[Xe]4f^7\ 5d^1\ 6s^2$ and $[Xe]4f^9\ 6s^2$

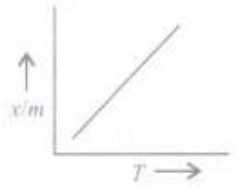
110. Beryllium shows diagonal relationship with aluminium. Which of the following similarity is incorrect?
a) Be_2C like Al_4C_3 yields methane on hydrolysis
b) Be like Al is rendered passive by HNO_3 c) $Be(OH)_2$ like $Al(OH)_3$ is basic
d) Be forms beryllates and Al forms aluminates

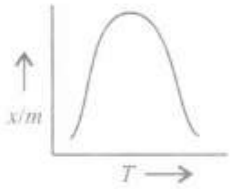
111. The electronic configuration of gadolinium (atomic number 64) is
a) $[Xe]\ 4f^3\ 5d^5\ 6s^2$ b) $[Xe]\ 4f^7\ 5d^2\ 6s^1$ c) $[Xe]\ 4f^7\ 5d^1\ 6s^2$ d) $[Xe]\ 4f^8\ 5d^6\ 6s^2$

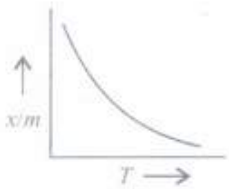
112. Which one of the following orders is not in accordance with the property stated against is?

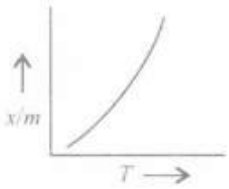
a) $HI > HBr > HCl < HF$: Acidic property in water
b) $F_2 > Cl_2 > Br_2 > I_2$: Electronegativity
c) $F_2 > Cl_2 > Br_2 > I_2$: Bond dissociation energy
d) $F_2 > Cl_2 > Br_2 > I_2$: Oxidising power

113. Boric acid is the trivial name for
a) orthoboric acid b) metaboric acid c) pyroboric acid d) None of these

114. Which of the plots is adsorption isobar for chemisorption?
a) 

b) 

c) 

d) 

115. In HS^-, I^- , R - NH_2 and NH_3, order of proton accepting tendency will be:
a) $I^- > NH_3 > RNH_2 > HS^-$ b) $HS^- > RNH_2 > NH_3 > I^-$ c) R - NH_2 > NH_3 > HS^- > I^-
d) $NH_3 > RNH_2 > HS^- > I^-$

116. If the enthalpy change or the transition of liquid water to steam is $30\ kJ\ mol^{-1}$ at $27^\circ C$, the entropy change for the process would be:
a) $10\ J\ mol^{-1}\ K^{-1}$ b) $10\ J\ mol^{-1}\ K^{-1}$ c) $0.1\ J\ mol^{-1}\ K^{-1}$
d) $100\ J\ mol^{-1}\ K^{-1}$

117. The production of dihydrogen obtained from coal gasification can be increased by reacting carbon monoxide of syngas mixture with steam in presence of a catalyst iron chromate. What is this process called?
a) Hydrogen reaction b) Water-gas shift reaction c) Coal-gas shift reaction
d) Syn gasification

118. Which of the following undergoes nucleophilic substitution exclusively by S_N1 mechanism.
a) Ethyl chloride b) Isopropyl chloride c) Chlorobenzene d) Benzylchloride

119. If 1g of solute (molar mass = 50 g mol^{-1}) is dissolved in 50 g of solvent and the elevation in boiling point is 1K. The molar boiling constant of the solvent is
a) 2 b) 3 c) 2.5 d) 5

120. In the reaction: $Cl_2 + OH^- \rightarrow Cl^- + ClO_4^- + H_2O$
a) Chlorine is oxidised. b) Chlorine is reduced.
c) Chlorine is oxidised as well as reduced. d) Chlorine is neither oxidised nor reduced.

121. Select correct statement(s) about radius of an atom
a)
values of van der Waal's radii are larger than those of covalent radii because the van der waal's forces are much weaker than the forces operating between atoms in covalently bonded molecule
b)
the metallic radii are smaller than the van der waal's radii, since the bonding forces in the metallic crystal lattice are much stronger than the vander waal's forces.

c) both are correct d) none is correct

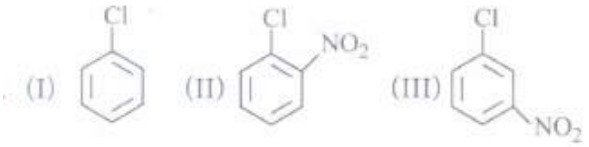
122. Which of the following statements is not correct about the given reaction?

$$K_4[Fe(CN)_6] \xrightarrow{Oxidation} Fe^{3+} + CO_2 + NO_3^-$$

a) Fe is oxidised from Fe^{2+} to Fe^{3+}. b) Carbon is oxidised from C^{2+} to C^{4+}.
c) N is oxidised from N^{3-} to N^{5+}. d) Carbon is not oxidised.

123. What is the biological importance of Na+ and K^+ ions in cell fluids like blood plasma?
a) They participate in transmission of nerve signals
b) They regulate the number of red and white blood corpuscles in the cell
c) They can be present in any amount in the blood since they are absorbed by the cells
d) They regulate the viscosity and colour of the blood

124. Arrange the compounds in increasing order of rate of reaction towards nucleophilic substitution.



a) (I) < (II) < (III) b) (III) < (II) < (I) c) (I) < (III) < (II) d) (III) < (I) < (II)

125. An organic compound contains 69% carbon and 4.8% hydrogen, the remainder being oxygen. What will be the masses of carbon dioxide and water produced when 0.20 g of this substance is subjected to complete combustion.
a) 0.69 g and 0.048 g b) 0.506 g and 0.086 g c) 0.345 g and 0.024 g
d) 0.91 g and 0.72 g

126. Which of the following ions is the most resonance stabilised?
a) Ethoxide b) Phenoxide c) Butoxide d) Isopropoxide

127. In a closed insulated container a liquid is stirred with a paddle to increase the temperature, which of the following is true?
a) $\Delta E = \Delta W \neq 0, q = 0$ b) $\Delta E = W = 0, q \neq 0$ c) $\Delta E = 0, W = 0, q \neq 0$
d) $W = 0, \Delta E = 0, q \neq 0$

128. A black powder when heated with conc. HCl gives a greenish yellow gas. The gas acts as an oxidising and a bleaching agent. When it is passed over slaked lime, a white powder is formed which is a ready source of gas. The black powder and white powder respectively are
a) $KClO_3$ and $NaClO_3$ b) MnO_2 and $Ca(OCl)_2$ c) MnO_2 and $KClO_3$
d) $MnCl_4$ and $COCl_2$

129. The ratio of magnetic moments of Fe (III) and Co (II) is
a) $\sqrt{7} : \sqrt{3}$ b) $\sqrt{35} : \sqrt{15}$ c) 7:3 d) $\sqrt{24} : \sqrt{15}$

130. Which of the following is true about the charge acquired by p-type semiconductors?
a) positive b) neutral c) negative d) depends on concentration of p impurity

131. Two students performed the same experiment separately and each one of them recorded two readings of mass which are given below. Correct reading of mass is 3.0 g. On the basis of given data, mark the correct option out of the following statements.

Student	Readings	
	(i)	(ii)
A	3.01	2.99
B	3.05	2.95

a) Results of both the students are neither accurate nor precise.
b) Results of student A are both precise and accurate.
c) Results of student B are neither precise nor accurate.
d) Results of student B are both precise and accurate.

132. At 25^0C, Nernst equation is

a) $E_{cell} = E^0_{cell} - \frac{0.0591}{n} log \frac{[ion]_{RHS}}{[ion]_{LHS}}$ b) $E_{cell} = E^0_{cell} - \frac{0.0591}{n} log \frac{[M]_{RHS}}{[M]_{LHS}}$

c) $E_{cell} = E^0_{cell} + \frac{0.0591}{n} log \frac{[ion]_{RHS}}{[ion]_{LHS}}$ d) $E_{cell} = E^0_{cell} + \frac{0.0591}{n} log \frac{[ion]_{LHS}}{[ion]_{RHS}}$

133. If 60% of a first order reaction was completed in 60% minutes, 50% of the same reaction would be completed in approximately
$(\log 4 = 0.60, \log 5 = 0.69)$
a) 45 minutes b) 60 minutes c) 40 minutes d) 50 minutes

134. Hydrolysis of ozonide of but-l-ene gives
a) ethylene only b) acetaldehyde and formaldehyde
c) propionaldehyde and formaldehyde d) acetaldehyde only.

135. Match the column I with column II and mark the appropriate choice.

	Column I		Column - II
(A)	A_m	(i)	I/A
(B)	G*	(ii)	pl/A
(C)	k	(iii)	k/C
(D)	R	(iv)	G*/R

a) (A) $\rightarrow$ (i), (B) $\rightarrow$ (iii), (C) $\rightarrow$ (ii), (D) $\rightarrow$ (iv)
b) (A) $\rightarrow$ (iii), (B) $\rightarrow$ (i), (C)$\rightarrow$ (iv), (D) $\rightarrow$ (ii)
c) (A) $\rightarrow$ (ii), (B) $\rightarrow$ (iv), (C) $\rightarrow$ (iii), (D) $\rightarrow$ (i)
d) (A) $\rightarrow$ (iv), (B) $\rightarrow$ (ii), (C) $\rightarrow$ (i), (D) $\rightarrow$ (iii)

136. Composition of mischmetal is
a) 5% of a lanthanoid metal, 95% of iron and traces of S, C, Ca and Al
b) 95% of an actinoid metal, 5% of iron and traces of S, C, Ca and Al
c) 95% of a lanthanoid metal, 5% of iron and traces of S, C, Ca and Al
d) 95% of a transition metal, 5% of iron and traces of S, C, Ca and Al.

137. Iron can be obtained by reduction of iron oxide (Fe_3O_4)With CO according to the reaction;
$Fe_3O_4 + 4CO \rightarrow 3Fe + 4CO_2$
How many kg of Fe_3O_4 should be heated with CO to get 3 kg of iron?

a) 8.12 kg b) 4.14 kg c) 6.94 kg d) 16.8 kg

138. Aqueous solution of acetic acid contains:
a) CH_3COO^- and H^+ b) CH_3COO^-, H_3O^+ and CH_3COOH c) CH_3COO^-, H_3O^+ and H^+
d) CH_3COOH, CH_3COO^- and H^+

139. Arrange the oxides of manganese according to increasing acidic strength.
a) $MnO < Mn_3O_4 < Mn_2O_3 < MnO_2 < Mn_2O_7$
b) $Mn_2O_7 < MnO_2 < Mn_2O_3 < Mn_3O_4 < MnO$
c) $MnO_2 < Mn_2O_7 < Mn_3O_4 < Mn_2O_3 < MnO$
d) $Mn_3O_4 < Mn_2O_3 < Mn_2O_7 < MnO_2 < MnO$

140. Unlike phenol, 2,4-dinitrophenol is soluble in sodium carbonate solution in water because
a) presence of two $-NO_2$ groups make the hydrogen bonding easier, making
b) nitro group reacts with Na_2CO_3 while -OH group does not
c)
presence of two-NO_2 groups in the ring makes 2, 4-dinitrophenol a stronger acid than phenol
d)
presence of two - NO_2 groups in the ring makes 2, 4-dinitrophenol a weaker acid than phenol

141. Which of the following molecules has highest dipole moment?
a) CH_3Cl b) CH_2Cl_2 c) $CHCl_3$ d) CCl_4

142. For a 3s-orbital $\Psi(3s) = \frac{1}{9\sqrt{3}}\left(\frac{1}{a_0}\right)^{3/2}$ $(6-6\sigma+\sigma^2)e^{-\sigma/2}$; where $\sigma = \frac{2r.\,Z}{3a_0}$ what is the maximum radial distance of node from nucleus?
a) $\frac{\left(3+\sqrt{3}\right)a_0}{z}$ b) $\frac{a_0}{Z}$ c) $\frac{3}{2}\frac{\left(3+\sqrt{3}\right)a_0}{z}$ d) $\frac{2a_0}{Z}$

143. On addition of conc. H_2SO_4 to a chloride salt, colourless fumes are evolved but in case of iodide salt, violet fumes come out. This is because
a) H_2SO_4 reduces HI to I_2 b) HI is of violet colour c) HI gets oxidised to I_2
d) HI changes to HIO_3.

144. Which of the following is a Lewis acid?
a) $AlCl_3$ b) $MgCl_2$ c) $CaCl_2$ d) $BaCl_2$

145. The crystal structures of both chaoite and carbon (VI) are based on:
a) $-C \equiv C - C \equiv C-$ b) $-C \equiv \underset{|}{C} - \underset{|}{C} \equiv C-$ c) $-\overset{|}{\underset{|}{C}} - \overset{|}{\underset{|}{C}}-$ d) All of these

146. Match the complexes given in column I with the oxidation states of central metal atoms given in column II and mark the appropriate choice.

	Column I (Complex)		Column II (Oxidation state of central atom)
(A)	$K_3[Co(C_2O_4)_2Cl_2]$	(i)	0
(B)	$[Pt(C_2H_4)Cl_3]^-$	(ii)	+1
(C)	$[Fe(H_2O)_5NO]SO_4$	(iii)	+3
(D)	$[Ni(CO)_4]$	(iv)	+2

a) (A) → (ii), (B) → (i), (C) → (iv), (0)→ (iii) b) (A)→ (iv), (B) → (ii), (C) → (i), (0) → (iii)
c) (A) → (iii), (B) → (iv), (C) → (ii), (0) → (i) d) (A) → (i), (B) → (ii), (C)→(iii), (D) → (iv)

147. Which one of the following sets of ions represents the collection of isoelectronic species?
a) Na^+, Mg^{2+}, Al^{3+}, F^- b) K^+, Ca^{2+}, Sc^{3+}, Cl^- c) K^+, Cl^-, Mg^{2+}, Sc^{3+}
d) Na^+, Mg^{2+}, Al^{3+},Cl^-

148. In face centred cubic unit cell, edge length is
a) $\frac{4}{\sqrt{3}}r$ b) $\frac{4}{\sqrt{2}}r$ c) 2r d) $\frac{\sqrt{3}}{2}r$

149. 4d, 5p, 5f and 6p orbitals are arranged in the order of decreasing energy. The correct option is:
a) 6p>5f>5p>4d b) 6p>5f>4d>5p c) 5f>6p>4d>5p d) 5f>6p>5p>4d

150. For an ideal solution with PA > PB, which of the following is true?
a) $(x_A)_{liquid} = (x_A)_{vapour}$ b) $(x_A)_{liquid} > (x_A)_{vapour}$ c) $(x_A)_{liquid} > (x_A)_{vapour}$
d) $(x_A)_{liquid}$ and $(x_A)_{vapour}$ do not bear any relationship with each other

151. Which one of the following is an ore of silver?
a) Argentite b) Stibnite c) Haematite d) Bauxite

152. The following data are obtained when dinitrogen and dioxygen react together to form different compounds:

Mass of dinitrogen	Mass of dioxygen
14 g	16 g
14 g	32 g
28 g	32 g
28 g	96 g

Which law of chemical combination is obeyed by the above experimental data?
a) Law of conservation of mass b) Law of definite proportions
c) Law of multiple proportions d) Avogadro's Law

153. in the given reactions:
(i) CH3Br $\xrightarrow{Na,\ ether}$ $X \xrightarrow[Br_2]{hv} Y \xrightarrow[CaO]{Na,\ ether}$ Z
(ii)CH3COOH $\xrightarrow{NaOH}$ $X \xrightarrow[NaOH]{} Y \xrightarrow[Br_2]{hv}$ Z

a)

	X	Y	Z
(i)	CH_4	CH_3Br	CH_3CH_3
(ii)	CH_3COONa	CH_3CH_3	CH_3CH_2Br

b)

	X	Y	Z
(i)	CH_3CH_3	CH_4	CH_3Br
(ii)	CH_3COONa	CH_4	$CH_3CH_2CH_3$

c)

	X	Y	Z
(i)	CH_3CH_2Br	CH_3CH_3	$CH_3CH_2CH_3$
(ii)	$CH_3COONaCH_4$	CH_4	CH_3Br

d)

	X	Y	Z
(i)	CH_3CH_3	CH_3CH_2Br	$CH_3CH_2CH_2CH_3$
(ii)	CH_3COONa	CH_4	CH_3Br

154. When a gas is bubbled through water at 298 K, a very dilute solution of gas is obtained. Henry's law constant for the gas is 100 k bar. If gas exerts a pressure of 1 bar, the number of moles of gas dissolved in 1 litre of water is:
a) 0.555 b) 55.55×10^{-5} c) 55.55×10^{-3} d) 5.55×10^{-5}

155. Which is/are used as ligand in complexes?
a) CN^- b) CO c) Both (a) and (b) d) None of these

156. Name the type of the structure of silicate in which one oxygen atom of $[SiO_4]^{4-}$ is shared?
a) Linear chain silicate b) Sheet silicate c) Pyrosilicate d) Three dimensional

157. SO_2 acts as an oxidant while reacting with:
a) acidified $KMnO_4$ b) acidified $K_2Cr_2O_7$ c) H_2S d) acidified C_2H_5OH

158. Which method can be applied to separate a mixture of camphor and benzoic acid?
a) Sublimation b) Chemical methods c) Crystallisation d) Extraction with solvent

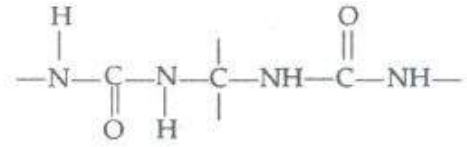
159. **Assertion:** Aromatic aldehydes and formaldehyde undergo Cannizzaro reaction.
Reason : Those aldehydes which have a- H atom undergo Cannizzaro reaction
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

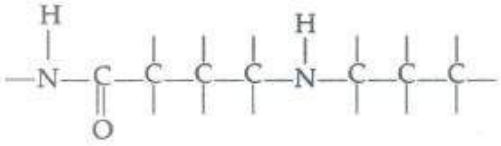
160. Inorganic benzene is
a) B_3H_3N3 b) BH_3NH_3 c) $B_3H_6N_3$ d) $H_3B_3N_6$

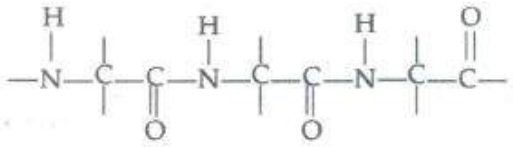
161. Liquid hydrocarbons can be converted to a mixture of gaseous hydrocarbons by:
a) Oxidation b) Cracking c) Distillation under reduced pressure d) Hydrolysis

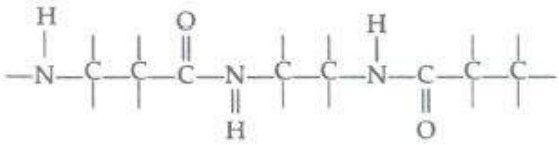
162. Hydrogen gas is prepared in the laboratory by reacting dilute HCl with granulated zinc. Following reaction takes place:
$Zn + 2HCl \rightarrow ZnCl_2 + H_2$
What would be the volume of hydrogen gas liberated at STP when 32.65 g of zinc reacts with HCl?
a) 10.03 L b) 11.35 L c) 11.57 L d) 9.53 L

163. Which of the following structures represents the peptide chain?

a) 

b) 

c) 

d) 

164. How do we separate two sulphide ores by froth floatation method?
a) By using excess of pine oil
b) By adjusting proportion of oil to water or using depressant
c) By using collectors and froth stabilisers like xanthates.
d) By using some solvent in which one of the sulphides is soluble.

165. In the fluorite structure, the coordination number of Ca^{2+} ions is
a) 4 b) 6 c) 8 d) 3

166. What is equivalent mass of $(NH_4)_2Cr_2O_7$ in the change $(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$?
a) $\frac{M}{2}$ b) $\frac{M}{3}$ c) $\frac{M}{4}$ d) $\frac{M}{6}$

167. Incorrect statement is
a) Fluorine has the highest electron affinity
b) Greater the nuclear charge, greater is the electron affinity
c) The electron affinity of Nitrogen is positive (energy is absorbed)
d) Chlorine has highest electron affinity

168. When zeolite is treateed with hard water, there is exchange reaction between calcium/magnesium ion/ and.....
a) aluminium ion b) sodium ion c) water of hydration d) sulphate ion

169. If highest magnetic quantum number of a given atom is represented by 3, then what will be its principal quantum number?
a) 2 b) 3 c) 4 d) 1

170. For the reaction:
$CH_4(g) + 2O_2(g) \rightleftharpoons CO_2(g) + 2H_2O(l)$
$\Delta H_r = -170.8\ kJmol^{-1}$
Which of the following statements is not true?
a) At equilibrium, the concentrations of $CO_2(g)$ and $H_2O_{(l)}$ are not equal
b) The equilibrium constant for the reaction is given by $K_C = \frac{[CO_2]}{[CH_4][O_2]}$
c) Addition of $CH_{4(g)}$ or $O_{2(g)}$ at equilibrium will cause a shift to the right.
d) The reaction is exothermic

171. Standard enthalpy of vaporisation $\Delta_{vap} H^0$ for water at 100°C is 40.66 kJ mol^{-1}. The internal energy of vaporization of water at 100°C (in kJ mol^{-1}) is: (assume water vapour to behave like an ideal gas).
a) +37.56 b) -43.76 c) +43.76 d) +40.66

172. Which of the following colligative property can provide molar mass of proteins (or polymers or colloids) with greatest precision?
a) Osmotic pressure b) Elevation in boiling point c) Depression in freezing point
d) Relative lowering of vapour pressure

173. Which among the following is paramagnetic?
a) Cl_2O b) ClO_2 c) Cl_2O_7 d) Cl_2O_6

174. A 20 litre container at 400 K contains $CO_2(g)$ at pressure 0.4 atm an excess of SrO (neglect the volume of solid SrO. The volume of the container is now decreased by moving the movable piston fitted in the container. The maximum volume of the container, when pressure of CO_2 attains its maximum value,
Given that: $SrC0_{3(S)} \rightleftharpoons SrO_{(s)} + CO_{2(g)}$, ($K_P$= 1.6 atm)
a) 5 L b) 10 L c) 10 L d) 2 L

175. The number of carbon atoms in Buckminsterfullerence is
a) 60 b) 70 c) 80 d) 50 e) 350

176. Assuming N_2 molecule of spherical shape with radius 2 x 10^{-9}cm, the percentage of empty space in one mole of N_2 gas taken at STP is:
a) 0.1% b) 99.9% c) 90% d) 10%

177. In Duma's method of estimation of nitrogen 0.35gm of an organic compound gave 55 ml of nitrogen collected at 300 K temperature and 715mm pressure. The percentage composition of nitrogen in the compound would be (Aqueous tension at 300K = 15mm)
a) 16.45 b) 17.45 c) 14.45 d) 15.45

178. The function of enzymes in the living system is to _____.
a) transport oxygen b) provide immunity c) catalyse biochemical reactions
d) provide energy

179. A magnetic moment at 1.73 BM will be shown by one among of the following:
a) $TiCl_4$ b) $[CoCl_6]^4$ c) $[Cu(NH_3)_4]^{2+}$ d) $[Ni(CN)_4]^{2-}$

180. Which of the statements is not true?
a) On passing H_2S through acidified $K_2Cr_2O_7$ solution, a milky colour is observed.
b) $Na_2Cr_2O_7$ is preferred over $K_2Cr_2O_7$ in volumetric analysis.
c) $K_2Cr_2O_7$, solution is acidic medium is orange
d) $K_2Cr_2O_7$, solution becomes yellow on increasing the pH beyond 7.

181. For the four successive transition elements (Cr, Mn, Fe and Co), the stability of +2 oxidation state will be there in which of the following order?
(At. nos. $Cr = 24, Mn = 25, Fe = 26, Co = 27$)
a) $Mn > Fe > Cr > Co$ b) $Fe > Mn > Co > Cr$ c) $Co > Mn > Fe > Cr$
d) $Cr > Mn > Co > Fe$

182. S-1 : Formation of Mg^{2+} and Al^{3+}, both require the absorption of energy.
S-2 : The following set of elements represent the correct order of electron affinity values S > Se > Te > O
S-3 : The size of the isoelectronic species is affected by electron-electron interaction in

the outer orbitals.

S-4 : Chemistry of the elements depend on the valence shell electron configurations as well as nuclear masses.

a) TTFF b) TFTF c) TTFT d) TTTT

183. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Transparent soaps are made by dissolving soaps in ethanol.

Reason: Ethanol makes things invisible

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

184. Which statement is incorrect?

a) $Ni(CO)_4$-tetrahedral, paramagnetic b) $Ni(CN)_4^{2-}$-square planar, diamagnetic

c) $Ni(CO)_4$-tetrahedral, diamagnetic d) $Ni(Cl)_4^{2-}$-tetrahedral, paramagnetic

185. While charging the lead storage battery_____.

a) $PbSO_4$ anode is reduced to Pb b) $PbSO_4$ cathode is reduced to Pb

c) $PbSO_4$ cathode is oxidised to Pb d) $PbSO_4$ anode is oxidised to PbO_2

186. **Assertion :** In electrolysis of aqueous NaCl the product obtained is H_2 gas.

Reason: Gases are liberated faster than the metals.

a) If assertion is true but reason is false. b) If both assertion and reason are false.

c)

If both assertion and reason are true and reason is the correct explanation of assertion.

d)

If both assertion and reason are true but reason is not the correct explanation of assertion.

187. Carbon monoxide is harmful to human beings as it

a) is carcinogenic b) is antagonistic to CO_2

c) has higher affinity for haemoglobin as compared to oxygen d) is destructive to CO_2

188. Which atom (X) is indicated by the following configuration?

$X \longrightarrow [Ne]\ 3s^2\ 3p^3$

a) Nitrogen b) Chlorine c) Phosphorus d) Sulphur

189. $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$. If the atomic mass of iron is 56. then its equivalent mass will be :

a) 42 b) 21 c) 63 d) 84

190. The pair of species with the same bond order is:

a) O_2^-, B_2 b) O_2^+, NO^+ c) NO,CO d) N_2,O_2

191. Which of the following statements is not correct about hexagonal close packing?

a) In hcp, atoms occupy 74% the available space

b) It is AB AB type packing in which third layer is aligned with the first layer.

c) Be, Mg, Mo etc. are found to have hcp structure d) The coordination number is 6.

192. Which of the following will not show cis-trans isomerism?

a) $CH_3 - CH = CH - CH_3$ b) $CH_3 - CH_2 - CH = CH - CH_2CH_3$

c) $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH - CH_2 - CH_3$ d) $CH_3 - \underset{\underset{CH_3}{|}}{C} - CH = CH - CH_2 - CH_3$

193. Which of the following gives positive Fehling solution test?

a) Protein b) Sucrose c) Glucose d) Fats

194. The oxidation number of phosphorus in $Mg_2P_2O_7$ is

a) +5 b) -5 c) +6 d) -7

195. At low pressure Vander Waal's equation for 3 moles of a real gas will have its simplified from

a) $\frac{PV}{RT-(3a/V)}=3$ b) $\frac{PV}{RT+RB}=3$ c) $\frac{PV}{RT-3Pb}=1$ d) $\frac{PV}{RT-(9/V)}=3$

196. The decomposition of organic compounds, sin the presence of oxygen and without the development of odoriferous substances is called _____.

a) decay b) N_2 - fixation c) nitrification d) dentrification

197. How many lithium atoms are present in a unit cell with edge length 3.5 $\mathring{A}$ and density 0.53 g cm^{-3} ? (Atomic mass of Li = 6.94)

a) 2 b) 1 c) 4 d) 6

198. H_3BO_3 is a:

a) monobasic and lewis acid b) monobasic and bronsted acid

c) monobasic and strong Lewis acid d) tribasic and weak Bronsted acid

199. The rate constants k_1 and k_2 for two different reactions are $10^{16}.e^{-2000/T}$ and $10^{15}.e^{-1000/T}$, respectively. The temperature at which $k_1 = k_2$ is :

a) 1000 K b) $\frac{2000}{2.303}K$ c) 2000 K d) $\frac{1000}{2.303}K$

200. Which of the following is a false statement?

a) Free radicals, carbonium ions or carbanions are reaction intermediates

b)

Reaction between methane and chlorine in presence of sunlight proceeds via free radical

c) The electronegative atom in the carbon chain produces +I effect.

d) Homolytic fission of C - C bonds gives free radicals