01. The dimensional formula of angular momentum is

(1) $[ML^2T^{-2}]$ (2) $[ML^{-2}T^{-1}]$

(3) $[MLT^{-1}]$ (4) $[ML^2T^{-1}]$

02. A car is moving along a straight road with a uniform acceleration. It passes through two points P and Q separated by a distance with velocity 30 km/h and 40 km/h respectively. The velocity of the car midway between P and Q is

(1) 33.3 km/h (2) $20\sqrt{2}$ km/h

(3) $25\sqrt{2}$ km/h (4) 35 km/h

03. The displacement of a body is given to be proportional to the cube of time elapsed. The magnitude of the acceleration of the body, is

(1) constant but not zero

(2) increasing with time

(3) zero

(4) decreasing with time

04. A train of 150 metre length is going towards north direction at a speed of 10 m/s. A parrot flies at the speed of 5 m/s towards south direction parallel to the railways track. The time taken by the parrot to cross the train is

(1) 12 sec. (2) 8 sec. (3) 15 sec. (4) 10 sec.

05. A body A is dropped vertically from the top of a tower. If another identical body B is projected horizontally from the same point at the same instant, then

(1) both A and B will reach the ground simultaneously

(2) A will reach the ground earlier than B

(3) B will reach the ground earlier than A

(4) either A or B

06. Starting from rest, a body slides down a 45° inclined plane in twice the time it takes to slide down the same distance in the absence of friction. The coefficient of friction between the body and the inclined plane is

(1) 0.80 (2) 0.75

(3) 0.25 (4) 0.33

07. The coefficient of restitution e for a perfectly elastic collision is

(1) 1 (2) 0

(3) ∞ (4) –1

08. A bullet of mass 10 g leaves a rifle at an initial velocity of 1000 m/s and strikes the earth at the same level with a velocity of 500 m/s. The work done in joule overcoming the resistance of air will be

(1) 375 (2) 3750 (3) 5000 (4) 500

09. A ring of mass m and radius r rotates about an axis passing through its centre and perpendicular to its plane with angular velocity ω. Its kinetic energy is

(1) $\frac{1}{2}mr^2\omega^2$ (2) $mr\omega^2$ (3) $mr^2\omega^2$ (4) $\frac{1}{2}mr\omega^2$

10. Radius of gyration of a body depends upon

(1) shape of the body (2) axis of rotation

(3) area of the body (4) Both (1) and (2)

11. The largest and the shortest distance of the earth from the sun are r_1 and r_2. Its distance from the sun when it is at perpendicular to the major–axis of the orbit drawn from the sun is

(1) $\frac{r_1 + r_2}{4}$ (2) $\frac{r_1 + r_2}{r_1 - r_2}$ (3) $\frac{2r_1r_2}{r_1 + r_2}$ (4) $\frac{r_1 + r_2}{3}$

12. Two satellites of mass m_1 and m_2 ($m_1 > m_2$) are going around the earth in orbits of radius r_1 and r_2 ($r_1 > r_2$). Which statement about their velocities is correct?

(1) $v_1 < v_2$ (2) $v_1 > v_2$

(3) $v_1/r_1 = v_2/r_2$ (4) $v_1 = v_2$

13. First law of thermodynamics is consequence of conservation of

(1) work (2) energy

(3) heat (4) all of these

14. 10 gm of ice cubes at 0°C are released in a tumbler (water equivalent 55 g) at 40°C. Assuming that negligible heat is taken from the surroundings, the temperature of water in the tumbler becomes nearly (L = 80 cal/g)

(1) 31°C (2) 22° C

(3) 19°C (4) 15°C

15. The bulb of one thermometer is spherical, while that of other is cylindrical. If both of them have equal amounts of mercury, which one will respond quickly to the temperature?
(1) Elliptical (2) Spherical
(3) Cylindrical (4) Both (2) and (3)

16. A metal rod at a temperature of 150°C, radiates energy at a rate of 20 W. If its temperature is increased to 300°C, then it will radiate at the rate of
(1) 40.8 W (2) 17.5 W
(3) 67.3 W (4) 37.2 W

17. A mass m is suspended from the two coupled springs connected in series. The force constant for springs are k_1 and k_2. The time period of the suspended mass will be
(1) $T = 2\pi\sqrt{\frac{m}{k_1 - k_2}}$ (2) $T = 2\pi\sqrt{\frac{mk_1k_2}{k_1 - k_2}}$
(3) $T = 2\pi\sqrt{\frac{m}{k_1 + k_2}}$ (4) $T = 2\pi\sqrt{\frac{m(k_1 + k_2)}{k_1k_2}}$

18. The composition of two simple harmonic motions of equal periods at right angles to each other and with a phase difference of π, results in the displacement of the particle along a
(1) straight line (2) circle
(3) hexagon (4) ellipse

19. Equation of progressive wave is given by $y = 4\sin\left[\pi\left(\frac{t}{5} - \frac{x}{9}\right) + \frac{\pi}{6}\right]$ where y, x are in cm and t is in seconds. Then which of the following is correct ?
(1) v = 5 cm / sec. (2) λ = 18 cm
(3) a = 0.04 cm (4) f = 50 Hz

20. The frequency of a tuning fork is 256 Hz. It will not resonate with a fork of frequency
(1) 738 Hz (2) 256 Hz
(3) 768 Hz (4) 512 Hz

21. Point charges +4q, –q and +4q are kept on the X–axis at point x = 0, x = a and x = 2a respectively.
(1) only –q is in stable equilibrium
(2) all the charges are in stable equilbrium
(3) all of the charges are in unstable equilibrium
(4) none of the charges is in equilibrium

22. A hollow metallic sphere of radius 10 cm is charged such that potential of its surface is 80 V. The potential at the centre of the sphere would be
(1) 80 V (2) 800 V
(3) zero (4) 8 V

23. Charge q_2 is at the centre of a circular path with radius r. Work done in carrying charge q_1, once around this equipotential path, would be
(1) $\frac{1}{4\pi\varepsilon_0} \times \frac{q_1q_2}{r^2}$ (2) $\frac{1}{4\pi\varepsilon_0} \times \frac{q_1q_2}{r}$
(3) zero (4) infinite

24. Simple capacitor filters are good for
(1) high current supply
(2) low voltage supply
(3) low voltage and high current supply
(4) low current supply

25. It is possible to have a positively charged body at
(1) positive potential
(2) zero potential
(3) negative potential
(4) all of these

26. The masses of the wires of copper in the ratio of 1 : 3 : 5 and their lengths are in the ratio of 5 : 3 : 1. The ratio of their electrical resistance is
(1) 1 : 3 : 5 (2) 5 : 3 : 1
(3) 1 : 25 : 125 (4) 125 : 15 : 1

27. The internal resistance of a cell of e.m.f. 2 volt is 0.1 Ω. It is connected to a resistance of 3.9 Ω. The voltage across the cell will be (in volt)
(1) 1.95 V (2) 0.5 V
(3) 2 V (4) 1.9 V

28. A current carrying coil is subjected to a uniform magnetic field. The coil will orient so that its plane becomes
(1) inclined at 45° to the magnetic field
(2) inclined at any arbitrary angle to the magnetic field
(3) parallel to the magnetic field
(4) perpendicular to magnetic field

29. A galvanometer can be changed into ammeter by providing
(1) high resistance in series
(2) low resistance in series
(3) high resistance in parallel
(4) low resistance in parallel

30. Eddy currents are produced when
(1) a metal is kept in varying magnetic field
(2) a metal is kept in steady magnetic field
(3) a circular coil is placed in a magnetic field
(4) through a circular coil, current is passed

31. The magnetic flux linked with a coil, in weber, is given by the equation : $\phi = 5t^2 + 3t + 16$. The induced e.m.f. in the coil in the fourth second will be
(1) 145 V (2) 10 V
(3) 210 V (4) 108 V

32. Which of the following electromagnetic radiations have the longest wavelength ?
(1) X–rays (2) γ–rsys
(3) Microwaves (4) Radiowaves

33. Focal length of a convex lens of refractive index 1.5 is 2 cm. Focal length of lens when immersed in a liquid of refractive index of 1.25 will be
(1) 10cm (2) 2.5cm (3) 5 cm (4) 7.5 cm

34. Which one of the following phenomena is not explained by Huygen's construction of wavefront?
(1) Refraction (2) Reflection
(3) Diffraction (4) Origin of spectra

35. The angle of a prism is 6° and its refractive index for green light is 1.5. If a green ray passes through it, the deviation will be
(1) 3° (2) 30° (3) 0° (4) 15°

36. Two lenses of power + 12D and –2D are combined together. What is their equivalent focal length?
(1) 16.6 cm (2) 10 cm
(3) 8.33 cm (4) 12.5 cm

37. The energy of a photon of wavelength λ is
(1) $hc\lambda$ (2) $\frac{hc}{\lambda}$ (3) $\frac{\lambda}{hc}$ (4) $\frac{\lambda h}{c}$

38. Thermions are
(1) protons (2) electrons
(3) photons (4) positrons

39. The dual nature of light is exhibited by
(1) photoelectric effect
(2) diffraction and reflection
(3) diffraction and photoelectric effect
(4) refraction and interference

40. A radioactive sample with a half life of 1 month has the label : 'Activity = 2 micro curies on 1 – 8 –1991'. What would be its activity two months earlier?
(1) 1.0 micro curie (2) 0.5 micro curie
(3) 4 micro curie (4) 8 micro curie

41. In Bohr model of hydrogen atom, which of the following is quantised?
(1) linear momentum of electron
(2) linear velocity of electron
(3) angular momentum of electron
(4) angular velocity of electron

42. p-n junction is said to be forward biased, when
(1) the positive pole of the battery is joined to the p-semiconductor and negative pole to the n-semiconductor
(2) the positive pole of the battery is joined to the n-semiconductor and p-semiconductor
(3) the positive pole of the battery is connected to n-semiconductor and p-semiconductor
(4) a mechanical force is applied in the forward direction.

43. At absolute zero, Si acts as
(1) non metal (2) metal
(3) insulator (4) none of these

44. A certain logic circuit has A and B as the two inputs and Y as the output. What is the logic gate in the circuit, if the truth table of the circuit is as shown below?

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

(1) XOR (2) OR (3) NOR (4) NAND

45. A pure semiconductor has a/ an
(1) finite resistance while decreases with temperature
(2) infinite resistance at 0^oC
(3) finite resistance which increases with temperature
(4) finite resistance which does not depend upon temperature

46. At S.T.P. the density of CCl_4 vapour in g/L will be nearest to
(1) 6.87 (2) 3.42
(3) 10.26 (4) 4.57

47. The spectrum of He is expected to be similar to that
(1) H (2) Li^+
(3) Na (4) He^+

48. The number of spherical nodes in 3p orbitals is/are
(1) One (2) Three
(3) None (4) Two

49. Pauling's electronegativity values for elements are useful in predicting
(1) Polarity of the molecules
(2) Position in the E.M.F. series
(3) Coordination numbers
(4) Dipole moments

50. The angle between the overlapping of one s–orbital and one p–orbital is
(1) 180° (2) 120°
(3) 109°28' (4) 120°, 60°

51. Equilateral shape has
(1) sp hybridisation (2) sp^2 hybridisation
(3) sp^3 hybridisation (4) dsp^3 hybridisation

52. If P, V, M, T and R are pressure, volume, molar mass, temperature and gas constant respectively, then for an ideal gas, the density is given by
(1) $\frac{RT}{PM}$ (2) $\frac{P}{RT}$ (3) $\frac{M}{V}$ (4) $\frac{PM}{RT}$

53. If ΔH is the change in enthalpy and ΔE, the change in internal energy accompanying a gaseous reaction, then
(1) ΔH is always greater than ΔE
(2) $\Delta H < \Delta E$ only if the number of moles of the products is greater than the number of moles of the reactants
(3) ΔH is always less than ΔE
(4) $\Delta H < \Delta E$ only if the number of moles of products is less than the number of moles of the reactants.

54. For the reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$, ΔH = ?
(1) $\Delta E + 2RT$ (2) $\Delta E - 2RT$
(3) $\Delta H = RT$ (4) $\Delta E - RT$

55. The compound whose water solution has the highest pH is
(1) NaCl (2) $NaHCO_3$
(3) Na_2CO_3 (4) NH_4C1

56. K_1 and K_2 are equilibrium constant for reactions (i) and (ii)

$N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$ ...(i)

$NO_{(g)} \rightleftharpoons \frac{1}{2}N_{2(g)} + \frac{1}{2}O_{2(g}$ ...(ii)

(1) $K_1 = \left(\frac{1}{K_2}\right)^2$ (2) $K_1 = K_2^2$

(3) $K_1 = \frac{1}{K_2}$ (4) $K_1 = (K_2)°$.

57. Aqueous solution of acetic acid contains
(1) CH_3COO^- and H^+
(2) CH_3COO^-, H_3O^+ and CH_3COOH
(3) CH_3COO^-, H_3O^+ and H^+
(4) CH_3COOH, CH_3COO^- and H^+

58. On electrolysis of dilute sulphuric acid using platinum electrodes, the product obtained at the anode will be
(1) hydrogen (2) oxygen
(3) hydrogen sulphide (4) sulphur dioxide

59. The reaction of H_2O_2 with H_2S is an example of ..... reaction
(1) Addition (2) Oxidation
(3) Reduction (4) Acidic

60. Which one of the following properties of alkali metals increases in magnitude as the atomic number rises?
(1) Ionic radius
(2) Melting point
(3) Electronegativity
(4) First ionization energy

61. Which of the following statements about H_3BO_3 is not correct?
(1) It has a layer structure in which planar BO_3 units are joined by hydrogen bonds
(2) It does not act as proton donor but acts as a Lewis acid by accepting hydroxyl ion
(3) It is a strong tribasic acid
(4) It is prepared by acidifying an aqueous solution of borax

62. How many chain isomers could be obtained from the alkane C_6H_{14}?
(1) Four (2) Five
(3) Six (4) Seven

63. The Cl–C–Cl angle in 1, 1, 2, 2-tetrachloroethene and tetrachloromethane respectively will be about
(1) 120° and 109.5° (2) 90° and 109.5°
(3) 109.5°and90° (4) 109.5° and 120°

64. Which of the following is an optically active compound ?
(1) 1-Butanol (2) 1-Propanol
(3) 2-Chlorobutane (4) 4-Hydroxyheptane

65. Acetylenic hydrogens are acidic because
(1) sigma electron density of C–H bond in acetylene is nearer to carbon, which has 50% s-character
(2) acetylene has only open hydrogen in each carbon
(3) acetylene contains least number of hydrogens among the possible hydrocarbons having two carbons
(4) Acetylene belongs to the class of alkynes with molecular formula, C_nH_{2n-2}.

66. Which is the most suitable reagent among the following to distinguish compound (3) from rest of the compounds ?
(a) $CH_3 - C\equiv C - CH_3$
(b) $CH_3 - CH_2 - CH_2 - CH_3$
(c) $CH_3 - CH_2C \equiv CH$ (d) $CH_3 - CH = CH_2$.
(1) Bromine in carbon tetrachloride
(2) Bromine in acetic acid
(3) Alk. $KMnO_4$
(4) Ammoniacal silver nitrate

67. Most crystals show good cleavage because their atoms, ions or molecules are
(1) weakly bonded together
(2) strongly bonded together
(3) spherically symmetrical
(4) arranged in planes

68. Sodium metal crystallises as a body centred cubic lattice with the cell edge 4.29 Å. What is the radius of sodium atom (in cm)?
(1) 9.312×10^{-7} (2) 1.857×10^{-8}
(3) 2.371×10^{-7} (4) 3.817×10^{-8}

69. An ideal solution is formed when its components
(1) have no volume change on mixing
(2) have no enthalpy change on mixing
(3) have both the above characteristics
(4) have high solubility

70. The molality of a solution having 18gm of glucose (mol. wt = 180) dissolved in 500 gm of water is
(1) 0.2 M (2) 0.1M (3) 2.2 M (4) 0.5 M

71. Standard reduction potentials at 25°C of $Li^+|Li$, $Ba^{2+}|Ba$, $Na^+|Na$ and $Mg^{2+}|Mg$ are – 3.05, – 2.90, –2.71 and –2.37 volt respectively. Which one of the following is the strongest oxidising agent?
(1) Ba^{2+} (2) Mg^{2+} (3) Na^+ (4) Li^+

72. Which of the following is not true about e.m.f. of a cell?
(1) Work calculated from it is not the maximum work obtainable from the cell.
(2) It is maximum voltage obtainable from the cell.
(3) It is the potential difference between two electrodes when no current is flowing in circuit.
(4) It is responsible for the flow of steady current in the cell.

73. By the action of enzymes, the rate of biochemical reaction
(1) does not change (2) increases
(3) decreases (4) either (1) or (3)

74. The rate, at which a substance reacts, depends upon its
(1) equivalent mass (2) molecular mass
(3) active mass (4) atomic mass

75. For the adsorption of a gas on a solid, the plot of log {x / m) versus log P is linear with slope equal to
(1) n (2) 1 / n
(3) k (4) log k

76. Calcium is obtained by
(1) reduction of calcium chloride with carbon
(2) electrolysis of molten anhydrous calcium chloride
(3) roasting of limestone
(4) electrolysis of solution of calcium chloride in H_2O

77. Hypo is used in photography to
(1) reduce AgBr grains to metallic silver
(2) convert metallic silver to silver salt
(3) remove undecomposed silver bromide as a soluble complex
(4) remove reduced silver

78. The oxidation state of Cr in $K_2Cr_2O_7$ is
(1) +5 (2) +3 (3) +6 (4) +7

79. Which of the following ligands is expected to be bidentate ?
(1) CH_3NH_2 (2) $CH_3C \equiv N$
(3) Br (4) $C_2O_4^{2-}$

80. Which of the following complex has square planar structure?
(1) $[Ni(CN)_4]^{2-}$ (2) $Ni(CO)_4$
(3) $[Zn(HN_3)_4]^{2+}$ (4) $[NiCl_4]^{2-}$

81. Phosgene is a common name for
(1) phosphoryl chloride
(2) thionyl chloride
(3) carbon dioxide and phosphine
(4) carbonyl chloride

82. The compound which reacts fastest with Lucas reagent at room temperature is
(1) butan–l–ol
(2) butan–2–ol
(3) 2–methylpropan–l–ol
(4) 2–methylpropan–2–ol

83. Ethyl alcohol exhibits acidic character on reacting with
(1) hydrogen iodide (2) acetic acid
(3) sodium metal (4) all of these

84. If formaldehyde and KOH are heated, then we get
(1) methane (2) methyl alcohol
(3) ethyl formate (4) acetylene

85. When ethanal is treated with Fehling's solution, it gives a precipitate of
(1) Cu_2O (2) Cu
(3) Cu_3O (4) CuO

86. Indicate which nitrogen compound amongst the following would undergo Hofmann reaction (i.e..., reaction with Br_2 and strong KOH) to furnish the primary amine ($R–NH_2$) ?
(1) $RCONHCH_3$ (2) $RCOONH_4$
(3) $RCONH_2$ (4) R–CO–NHOH

87. In the presence of an acid, hydrolysis of methyl cyanide produces
(1) methyl alcohol (2) acetic acid
(3) formic acid (4) methylamine

88. On hydrolysis of starch, we finally get
(1) glucose (2) fructose
(3) both (1) and (2) (4) sucrose

89. Nylon-6, 6 is made by using
(1) succinic acid (2) benzylchloride
(3) benzaldehyde (4) adipic acid

90. Diazo coupling is useful to prepare some
(1) pesticides (2) dyes
(3) proteins (4) vitamins

91. True nucleus is absent in :-
(1) Anabaena (2) Mucor
(3) Vaucheria (4) Volvox

92. Cell wall is absent in :-
(1) Aspergillus (2) Funaria
(3) Mycoplasma (4) Nostoc

93. The imperfect fungi which are decomposers of litter and help in mineral cycling belong to :-
(1) Deuteromycetes
(2) Basidiomycetes
(3) Phycomycetes
(4) Ascomycetes

94. Choose the wrong statement ?
(1) Penicillium is multicellular and produces antibiotics.
(2) Neurospora is used in the study of biochemical genetics.
(3) Morels and truffles are poisonous mushrooms.
(4) Yeast is unicellular and useful in fermentation.

95. In which group of organisms the cell walls form two thin overlapping shells which fit together ?
(1) Chrysophytes (2) Euglenoids
(3) Dinoflagellates (4) Slime moulds

96. The structures that help some bacteria to attach to rocks and/or host tissues are :-
(1) rhizoids (2) fimbriae
(3) mesosomes (4) holdfast

97. Vascular bundles in monocotyledons are considered closed because :-
(1) a bundle sheath surrounds each bundle
(2) cambium is absent
(3) there are no vessels with performations
(4) xylem is surrounded all around by phloem

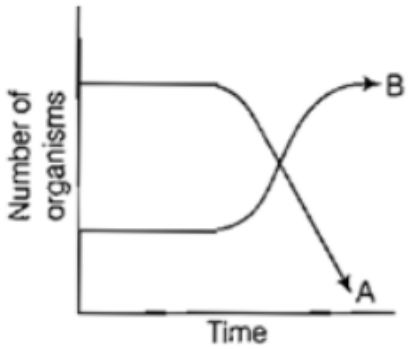
98. A major characteristic of the monocot root is the presence of :-
(1) open vascular bundles
(2) scattered vascular bundles
(3) vasculature without cambium
(4) cambium sandwitched between phloem and xylem along the radius

99. The species confined to a particular region and not found elsewhere is termed as :-
(1) keystone (2) alien
(3) endemic (4) rare

100. During ecological succession :-
(1) the gradual and predictable change in species composition occurs in a given area
(2) the establishment of a new biotic community is very fast in its primary phase
(3) the numbers and types of animals remain constant
(4) the changes lead to a community that is in near equilibrium with the environment and is called pioneer community

101. In a ring girdled plant ?
(1) the shoot dies first
(2) the root dies first
(3) the shoot and root die together
(4) Neither root nor shoot will die

102. The following graph depicts changes in two populations (A and B) of herbivores in grassy field A possible reason for these changes is that :-



(1) both plant populations in this habitat decreased
(2) population-B competed more successfully for food than population-A
(3) population-A produced more offspring than population-B
(4) population-A consumed the members of population-B

103. Arrange the following events of meiosis in correct sequences ?
I. Crossing Over
II. Synapsis
III. temninalisation of chaismata
IV. Disapperance of nucleolus
(1) II, I, IV, III
(2) II, I, III, IV
(3) I, II, III, IV
(4) II, III, IV, I

104. Which one gives the most valid and recent explanation for stomatal movements ?
(1) Transpiration
(2) Potassium influx and efflux
(3) Starch hydrolysis
(4) Guard cell photosynthesis

105. Most animals that in deep oceanic water are :-
(1) primary consumers
(2) secondary consumers
(3) tertiary consumers
(4) detritivores

106. Vertical distribution of different species occupying different levels in a biotic community is known as :-
(1) divergence (2) stratification
(3) zonation (4) pyramid

107. Secondary succession takes place on/in :-
(1) bara rock
(2) degraded forest
(3) newly created pond
(4) newly cooledd lava

108. The chromosomes in which centromere is situated close to one end are :-
(1) metacentric (2) acrocentric
(3) telocentric (4) sub-metacentric

109. A somatic cell that has just completed the S-phase of its cell cycle, as compared to gamete of the same species has :-
(1) twice the number of chromosomes and twice the amount of DNA
(2) same number of chromosomes but twice the amount of DNA
(3) twice the number of chromosomes and four times the amount of DNA
(4) four times the number of chromosomes andtwice the amount of DNA

110. Root pressure develops due to :-
(1) active absorption
(2) low osmotic potential in soil
(3) passive absorption
(4) increase in transpiration

111. A column of water within xylem vessels of tall trees does not break under its weight because of :-
(1) dissolved sugars in water
(2) tensile strength of water
(3) lignification of xylem vessels
(4) positive root pressure

112. Transpiration and root pressure cause water to rise in plants by :-
(1) Pulling it upward
(2) pulling and pushing it, respectively
(3) pushing it upward
(4) pushing and pulling it, respectively

113. Outbreeding is an important stategy of animal husbandry because it :-
(1) help in accumulation of superior genes
(2) is useful in producing purelines of animals
(3) is useful in overcoming inbreeding depression
(4) exposes harmful recessive genes that are eliminated by selection

114. A technique of micropropagation is :-
(1) Somatic hybridisation
(2) Somatic embryogenesis
(3) Protoplast fusion
(4) Embryo rescue

115. Cellular organelles with membranes are :-
(1) nuclei, ribosomes and mitochondria
(2) chromosomes, ribosomes and endoplasmic reticulum
(3) endoplasmic reticulum, ribosomes and nuclie
(4) lysosomes, Golgi apparatus and mitochondria.

116. Which of the following are the important floral rewards to the animal pollinators ?
(1) Colour and large size of flower
(2) Nectar and pollen grains
(3) Floral fragrance and calcium crystals
(4) Protein pellicle and stigmatic exudates

117. Filiform apparatus is characteristic feature of
(1) generative cell (2) nucellar embryo
(3) aleurone cell (4) synergids

118. Balbiani rings are sites of :-
(1) lipid synthesis
(2) nucleotide synthesis
(3) polysaccharide synthesis
(4) RNA and protein synthesis

119. Which of the following are not membrane bound?
(1) Vacuoles (2) Ribosomes
(3) Lysosomes (4) Mesosomes

120. Which one of the following may require pollinators, but is genetically similar to autogamy ?
(1) Geitonogamy (2) Xenogamy
(3) Apogamy (4) Cleistogamy

121. Which one of the following is not an inclusion body found in prokaryotes ?
(1) Phosphate granule
(2) Cyanophycean granule
(3) Glycogen granule
(4) Polysome

122. Cytochromes are found in :-
(1) matrix of mitochondria
(2) outer wall of mitochondria
(3) cristae of mitochondria
(4) lysosomes

123. What causes a green plant exposed to the light on only one side, to bend toward the source of light as it grows ?
(1) Green plants need light to perform photosynthesis
(2) Green plants seek light because they are phototropic
(3) Light stimulates plant cells on the lighted side to grow faster
(4) Auxin accumulates on the shaded side, stimulating greater cell elongation there

124. Which one is a wrong statement ?
(1) Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms.
(2) Mucor has biflagellate zoospores.
(3) Haploid endosperm is typical feature of gymnosperm.
(4) Brown algae have chlorophyll-a and c, and fucoxanthin.

125. In his classic experiments on pea plants, Mendel did not use :-
(1) seed colour (2) pod length
(3) seed shape (4) flower position

126. Read the following five statements (I to V) and select the option with all correct statements.
I. Mosses and lichens are the first organisms to colonise a bare rock.
II. Selaginella is a homosporous pteridophyte.
III. Coralloid roots in Cycas have VAM.
IV. main plant body in bryophytes is gametophytic, whereas in pteridophytes it is sporophytic.
V. In gymnosperms, male and female gametophytes are present within sporangia located on sporophyte.
(1) I, III and IV
(2) II, III and IV
(3) I, IV and V
(4) II, III and V

127. A gene showing codominance has :-
(1) one allele dominant on the other
(2) alleles tightly linked on the same chromosome
(3) alleles that are recessive to each other
(4) both alleles independently expressed in the heterozygote

128. Which of the following animals is not viviparous ?
(1) Flying fox (bat) (2) Elephant
(3) Platypus (4) Whale

129. Which enyme helps in transfer of phosphate group from ATP to carbohydrate ?
(1) Phosphate (2) ATPase
(3) Phosphorylase (4) Catalase

130. The UN conference of Parties on climate change in the year 2012 was held at :-
(1) Durban (2) Doha
(3) Lima (4) Warsaw

131. Which of the following is not one of prime health risks associated with greater UV radiation through the atmosphere due to depletion of stratospheric zone ?
(1) Increased skin cancer
(2) Reduced immune system
(3) Damage to eyes
(4) Increased liver cancer

132. Increase in concentration of the toxicant at successive tropic levels is known as
(1) biomagnification
(2) biodeterioration
(3) biotransformation
(4) biogeochemical cycling

133. During biological nitrogen fixation, inactivation of nitrogenase by oxygen poisoning is prevented by :-
(1) leghaemoglobin (2) xanthophyll
(3) carotene (4) cytochrome

134. Auxin can be bioassayed by :-
(1) Avena coleoptile curvature
(2) hydroponics
(3) potometer
(4) lettuce hypocotyl elongation

135. Minerals known to be required in large amounts for plant growth include :-
(1) Phosphorus, potassium, sulphur, calcium
(2) calcium, magnesium, manganese, copper
(3) potassium, phosphorus, selenium, boron
(4) magnessium, sulphur, iron, zinc

136. Which one of the following is not applicable to RNA ?
(1) Complementary bse pairing
(2) 5' phosphoryl and 3' hydroxyl ends
(3) Heterocyclic nitrogenous bases
(4) Chargaff's rule

137. Identify the correct order of organisation of genetic material from largest to smallest :-
(1) Chromosome, gene, genome, nucleotide
(2) Genome, chromosome, nucleotide, gene
(3) Genome, chromosome, gene, nucleotide
(4) Chromosome, genome, nucleotide, gene

138.

A. Saccharomyces cerevisiae	1. Production of immuno suppressive agents
B. Monascus purpureus	2. Ripening of Swiss Cheese
C. Trichoderma polysporum	3. Commercial production of ethanol
D. Propionibacterium sharmanii	4. Production of blood-cholesterol lowering agents

CODES :

	A	B	C	D
(1)	3	4	1	2
(2)	4	3	2	1
(3)	4	2	1	3
(4)	3	1	4	2

139. Satellite DNA is important because it :-
(1) codes for protiens needed in cell cycle
(2) shows high degree of polymorphism in population and also the same degree of polymorphism in an individual, which is heritable from parents to children
(3) does not code for protiens and is same in all members of the population
(4) codes for enzymes needed for DNA replication.

140. The oxygen evolved during photosynthesis comes from water molecules. Which one of the following pairs of elements involved in this reaction ?
(1) Manganese and chlorine
(2) Manganese and potassium
(3) Manganese and molybdenum
(4) Magnesium and chlorine

141. The structures that are formed by stacking of organised flattened membranous sacs in the chloroplasts are :-
(1) cristae (2) grana
(3) stroma lamellae (4) stroma

142. Keel is the characteristic feature of flower of :-
(1) tulip (2) Indigofera
(3) Aloe (4) tomato

143. The endosperm of gymnosperm is
(1) Diploid (2) Polyploidy
(3) Triploid (4) Haploid

144. The wheat grain has an embryo with one large, sheild-shaped cotyledon known as :-
(1) epiblast (2) coleorrhiza
(3) scutellum (4) coleoptile

145. The shared terminal duct of the reproductive and urinary system in the human male is :-
(1) Urethra (2) Ureter
(3) Vas deferens (4) Vasa efferentia

146. The main function of mammalian corpus luteum is to produce :-
(1) estrogen only
(2) progesterone
(3) human chorionic gonadotropin
(4) relaxin only

147. Select the correct option describing gonadotropin activity in a normal pregnant female :-
(1) High level of FSH and LH stimulates the thickening of endometrium
(2) High level of FSH and LH facilitate implantation of the embryo
(3) High level of HCG stimulates the synthesis of estrogen and progesterone
(4) High level of HCG stimulates the thickening of endometrium

148. Select the correct matching of the type of the joint with the example in human skeletal system :-

Types of joint	Example
(1) Cartilaginous joint	Between frontal and parietal
(2) Pivot joint	Between third and fourth Cervical vertebrae
(3) Hinge joint	Between humerus and pectoral girdle
(4) Gliding joint	Between carpals

149. Stimulation of a muscle fibre by a motor neuron occurs at :-
(1) the neuromuscular junction
(2) the transverse tubules
(3) the myofibril
(4) the sacroplasmic reticulum

150. Injury localised to the hypothalams would most likely disrupt :-
(1) short term memory
(2) coordination during locomotion
(3) executive function, such as decision making
(4) regulation of body temperature

151. Choose the correctly matched pair.
(1) Tendon-Specialised connective tissue
(2) Adipose tissue-Dense connective tissue
(3) Areolar tissue-Loose connective tissue
(4) Cartilage-Loose connective tissue

152. Identify the hormone with its correct matching of source and function.
(1) Oxytocin-posterior pituitary, growth and maintenance of mammary glands
(2) Melatonin-pineal gland, regulates the normal rhythm of sleepwake cycle
(3) Progesterone-corpus luteum, stimulation of growth and activities of female secondary sex organs
(4) Atrial natriuretic factor-ventricular wall increases the blood pressure

153. Which one of the following statements is not correct ?
(1) Retinal is the light absorbing portion of visual photopigments
(2) In retina the rods have the photopigment rhodopsin, while cones have three different photopigments
(3) Retinal is a derivative of vitamin-C
(4) Rhodopsin is the purplish red protein present in rods only

154. Fight or flight reactions cause activation of :-
(1) the parathyroid glands, leading to increased metabolic rate
(2) the kidney, leading to suppression of reninangiotensin-aldosterone pathway
(3) the adrenal medulla, leading to increased secretion of epinephrine and norepinephrine
(4) the pancreas leading to a reduction in the blood sugar levels

155. In a population of 1000 individuals 360 belongs to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is :-
(1) 0.4 (2) 0.5
(3) 0.6 (4) 0.7

156. Forelimbs of cat, lizard used in walking; forelimbs of whale used in swimming and forelimbs of bats used in flying are an example of :-
(1) analogous organs
(2) adaptive radiation
(3) homologous organs
(4) convergent evolution

157. Which one of the following are analogous structures ?
(1) Wings of bat and wings of pigeon
(2) Gills of prawn and lungs of man
(3) Thorns of Bougainvillea and tendrils of Cucurbita
(4) Flippers of dolphin and legs of horse

158. At which stage of HIV infection does one usually show symptoms of AIDS ?
(1) Within 15 days of sexual contact with an infected person
(2) When the infected retro virus enters host cells
(3) When HIV damages large number of helper T-Lymphocytes
(4) When the viral DNA is produced by reverse transcriptase

159. Which is the particular type of drug that is obtained from the plant whose one flowering branch is shown below ?

(1) Hallucinogen (2) Depressant
(3) Stimulant (4) Pain-killer

160. Which of the following causes an increase in sodium reabsorption in distal convoluted tubule ?
(1) Increase in aldosterone levels
(2) Increase in antidiuretic hormone levels
(3) Decrease in aldosterone levels
(4) Decrease in antidiuretic hormone levels

161. Select the taxon mentioned that represents both marine and freshwater species :-
(1) Echinoderms (2) Ctenophora
(3) Cephalochordata (4) Cnidaria

162. Which one of the following living organisms completely lacks a cell wall ?
(1) Cyanobacteria
(2) Sea-fan (Gorgonia)
(3) Saccharomyces
(4) Blue-green algae

163. Planaria posses high capacity of :-
(1) metamorphosis
(2) regeneration
(3) alternation of generation
(4) bioluminescence

164. A marine cartilaginous fish that can produce electric current is :-
(1) Pristis (2) Torpedo
(3) Trygon (4) Scoltodon

165. The first human hormone produced by recombinant DNA technology is :-
(1) insulin (2) estrogen
(3) thyroxin (4) progesterone

166. Select the option which is not correct with respect to enzyme action.
(1) Substrate binds with enzyme as its active site
(2) Addition of lot of succinate does not reverse the inhibition of succinic dehydrogenase by malonate
(3) A non-competitive inhibitor binds the enzyme at a site distinct from that which binds the substrate
(4) Malonate is a competitive inhibitor of succinic dehydrogenase.

167. Which of the following is a non-reducing carbohydrate ?
(1) Maltose (2) Sucrose
(3) Lactose (4) Ribose 5-phosphate

168. Which vector can clone only a small fragment of DNA ?
(1) Bacterial artificial chromosome
(2) Yeast artificial chromosome
(3) Plasmid
(4) Cosmid

169. Which of the following is not a characteristic of pBR322 vector ?
(1) It is the first artificial cloning vector constructed in 1977 by Boliver and Rodriguez.
(2) It is the most widely used, versatile and easily manipulated vector.
(3) It has two antibiotic resistance genes, tet^R and amp^R .
(4) It does not have restriction site for Sal I.

170. How are transformants selected from nontransformants ?
(1) Presence of more than one recognition site in the vector DNA.
(2) Presence of alien DNA into the vector DNA results into insertional inactivation of selectable marker.
(3) Antibiotic resistance gene gets inactivated due to insertion of alien DNA.
(4) Both (b) and (c).

171. Person with blood group AB is considered as universal recipient because he has :-
(1) Both A and B antigens on RBC but no antibodies in the plasma
(2) Both A and B antibodies in the plasma
(3) No antigen on RBC and antibody in the plasma
(4) Both A and B antigens in the plasma but no antibodies

172. Select the correct statement about hormones and their actions.
(1) Parathyroid hormone increases absorption of the body.
(2) Insulin and glucagon helps to maintain blood sugar levels.
(3) Old aged people have weak immunity due to increased activity of thymus.
(4) Osteoporosis in women occurs due to increased levels of oestrogens.

173. Which one of the following vitamins is anti-haemorrhagic ?
(1) Vitamin B (2) Vitamin B
(3) Vitamin C (4) Vitamin K

174. Approximately seventy percent of carbon dioxide absorbed by the blood will be transported to the lungs :-
(1) as bicarbonate ions
(2) in the form of dissolved gas molecules
(3) by binding to RBC
(4) as carbamino-haemoglobin

175. A person sitting at rest experiences a temporary cessation of breathing after forced deep breathing for a few minutes.This is due to :-
(1) too much CO_2 in the blood
(2) too much O_2 in the blood
(3) very little CO_2 in the blood
(4) both high O_2 and very little CO_2 in the blood

176. Tubectomy is a method of sterilisation in which :-
(1) Small part of the Fallopian tube is removed or tied up
(2) Ovaries are removed surgically
(3) Small part of vas deferens is removed or tied up
(4) Uterus is removed surgically

177. Which of the following is a hormone releasing Intra Uterine Device (IUD) ?
(1) Multiload 375 (2) LNG-20
(3) Cervical cap (4) Vault

178. Assisted reproductive technology, IVF involves transfer of :-
(1) ovum into the Fallopian tube
(2) embryo upto 8-celled stage into the Fallopian tube
(3) embryo upto 8-celled stage into the uterus
(4) embryo with 16 balastomeres into the Fallopian tube

179. How do parasympathetic neural signals affect the working of the heart ?
(1) Reduce both heart rate and cardiac output
(2) heart rate is increased without affecting the cardiac output
(3) Both heart rate and cardiac output increase
(4) Heart rate decreases but cardiac output increases

180. A small rise in the body temperature of humans is corrected by :-
(i) sweating
(ii) dilating the skin arteries
(iii) constricting the skin arteries
(iv) increased tension of muscles in the skin.
(1) (i) only (2) (ii) only
(3) (i) and (ii) (4) (iii) and (iv)