PHYSICS

(SECTION-A)

1. If the normal force is doubled, the co-efficient of friction is :
(A) halved (B) doubled
(C) tripled (D) not changed

2. A man pushes a wall and fails to displace it. He does
(A) Negative work
(B) Positive but not maximum work
(C) No work at all
(D) Maximum work

3. The same retarding force is applied to stop a train. The train stops after 80 *m*. If the speed is doubled, then the distance will be
(A) The same (B) Doubled
(C) Halved (D) Four times

4. A body moves a distance of 10 *m* along a straight line under the action of a force of 5 *N*. If the work done is 25 *joules*, the angle which the force makes with the direction of motion of the body is
(A) 0° (B) 30°
(C) 60° (D) 90°

5. A force $\boldsymbol{F} = (5\hat{\boldsymbol{i}} + 3\hat{\boldsymbol{j}})$ *newton* is applied over a particle which displaces it from its origin to the point $\boldsymbol{r} = (2\hat{\boldsymbol{i}} - 1\hat{\boldsymbol{j}})$ *metres*. The work done on the particle is
(A) – 7 *joules* (B) + 13 *joules*
(C) + 7 *joules* (D) + 11 *joules*

6. A particle moves from position $\vec{r}_1 = 3\hat{i} + 2\hat{j} - 6\hat{k}$ to position $\vec{r}_2 = 14\hat{i} + 13\hat{j} + 9\hat{k}$ under the action of force $4\hat{i} + \hat{j} + 3\hat{k}\,N$. The work done will be
(A) 100 *J* (B) 50 *J*
(C) 200 *J* (D) 75 *J*

7. In an explosion a body breaks up into two pieces of unequal masses. In this
(A) Both parts will have numerically equal momentum
(B) Lighter part will have more momentum
(C) Heavier part will have more momentum
(D) Both parts will have equal kinetic energy

8. A force $\vec{F} = 6\hat{i} + 2\hat{j} - 3\hat{k}$ acts on a particle and produces a displacement of $\vec{s} = 2\hat{i} - 3\hat{j} + x\hat{k}$. If the work done is zero, the value of *x* is
(A) – 2 (B) 1/2 (C) 6 (D) 2

9. A spring of force constant 10 *N*/*m* has an initial stretch 0.20 *m*. In changing the stretch to 0.25 *m*, the increase in potential energy is about
(A) 0.1 *joule* (B) 0.2 *joule*
(C) 0.3 *joule* (D) 0.5 *joule*

10. Two springs of spring constants 1500 *N*/*m* and 3000 *N*/*m* respectively are stretched with the same force. They will have potential energy in the ratio
(A) 4 : 1 (B) 1 : 4
(C) 2 : 1 (D) 1 : 2

11. If a long spring is stretched by 0.02 *m*, its potential energy is *U*. If the spring is stretched by 0.1 *m*, then its potential energy will be
(A) $\frac{U}{5}$ (B) U
(C) 5*U* (D) 25*U*

12. Two bodies of masses m_1 and m_2 have equal kinetic energies. If p_1 and p_2 are their respective momentum, then ratio $p_1 : p_2$ is equal to
(A) $m_1 : m_2$ (B) $m_2 : m_1$
(C) $\sqrt{m_1} : \sqrt{m_2}$ (D) $m_1^2 : m_2^2$

13. A bomb of 12 *kg* explodes into two pieces of masses 4 *kg* and 8 *kg*. The velocity of 8*kg* mass is 6 *m*/*sec*. The kinetic energy of the other mass is
(A) 48 *J* (B) 32 *J*
(C) 24 *J* (D) 288 *J*

14. Two masses of 1 *gm* and 4 *gm* are moving with equal kinetic energies. The ratio of the magnitudes of their linear momenta is
(A) 4 : 1 (B) $\sqrt{2} : 1$
(C) 1 : 2 (D) 1 : 16

15. If the momentum of a body is increased by 100%, then the percentage increase in the kinetic energy is
(A) 150% (B) 200%
(C) 225% (D) 300%

16. If the distance between two masses is doubled, the gravitational attraction between them
(A) Is doubled
(B) Becomes four times
(C) Is reduced to half
(D) Is reduced to a quarter

17. The gravitational force F_g between two objects does not depend on
(A) Sum of the masses
(B) Product of the masses
(C) Gravitational constant
(D) Distance between the masses

18. The value of '*g*' at a particular point is $9.8\ m/s^2$. Suppose the earth suddenly shrinks uniformly to half its present size without losing any mass. The value of '*g*' at the same point (assuming that the distance of the point from the centre of earth does not shrink) will now be
(A) $4.9\ m/\sec^2$ (B) $3.1\ m/\sec^2$
(C) $9.8\ m/\sec^2$ (D) $19.6\ m/\sec^2$

19. If *R* is the radius of the earth and *g* the acceleration due to gravity on the earth's surface, the mean density of the earth is
(A) $4\pi G/3gR$ (B) $3\pi R/4gG$
(C) $3g/4\pi RG$ (D) $\pi RG/12G$

20. Spot the *wrong* statement :
The acceleration due to gravity '*g*' decreases if
(A) We go down from the surface of the earth towards its centre
(B) We go up from the surface of the earth
(C) We go from the equator towards the poles on the surface of the earth
(D) The rotational velocity of the earth is increased

21. The value of *g* on the earth's surface is $980\ cm/\sec^2$. Its value at a height of 64 *km* from the earth's surface is
(A) $960.40\ cm/\sec^2$
(B) $984.90\ cm/\sec^2$
(C) $982.45\ cm/\sec^2$
(D) $977.55\ cm/\sec^2$

22. At what altitude in metre will the acceleration due to gravity be 25% of that at the earth's surface (Radius of earth = *R metre*)
(A) $\frac{1}{4}R$ (B) *R* (C) $\frac{3}{8}R$ (D) $\frac{R}{2}$

23. Mass of moon is 7.34×10^{22} *kg*. If the acceleration due to gravity on the moon is $1.4\ m/s^2$, the radius of the moon is
$(G = 6.667\times10^{-11}\ Nm^2/kg^2)$
(A) $0.56\times10^4\ m$ (B) $1.87\times10^6\ m$
(C) $1.92\times10^6\ m$ (D) $1.01\times10^8\ m$

24. If the mass of earth is 80 times of that of a planet and diameter is double that of planet and '*g*' on earth is $9.8\ m/s^2$, then the value of '*g*' on that planet is
(A) $4.9\ m/s^2$ (B) $0.98\ m/s^2$
(C) $0.49\ m/s^2$ (D) $49\ m/s^2$

25. The density of a newly discovered planet is twice that of earth. The acceleration due to gravity at the surface of the planet is equal to that at the surface of the earth. If the radius of the earth is *R*, the radius of the planet would be
(A) $2R$ (B) $4R$
(C) $\frac{1}{4}R$ (D) $\frac{1}{2}R$

26. In a gravitational field, at a point where the gravitational potential is zero
(A) The gravitational field is necessarily zero
(B) The gravitational field is not necessarily zero
(C) Nothing can be said definitely about the gravitational field
(D) None of these

27. The gravitational potential energy of a body of mass '*m*' at the earth's surface $-mgR_e$. Its gravitational potential energy at a height R_e from the earth's surface will be (Here R_e is the radius of the earth)
(A) $-2mgR_e$ (B) $2mgR_e$
(C) $\frac{1}{2}mgR_e$ (D) $-\frac{1}{2}mgR_e$

28. The escape velocity from the earth is about 11 *km*/*second*. The escape velocity from a planet having twice the radius and the same mean density as the earth, is
(A) 22 *km*/*sec* (B) 11 *km*/*sec*
(C) 5.5 *km*/*sec* (D) 15.5 *km*/*sec*

29. If v_e and v_o represent the escape velocity and orbital velocity of a satellite corresponding to a circular orbit of radius *R*, then

(A) $v_e = v_o$

(B) $\sqrt{2}v_o = v_e$

(C) $v_e = v_0/\sqrt{2}$

(D) v_e and v_o are not related

30. If the height of a satellite from the earth is negligible in comparison to the radius of the earth *R*, the orbital velocity of the satellite is

(A) *gR* (B) *gR*/2

(C) $\sqrt{g/R}$ (D) $\sqrt{gR}$

31. All the particles of a rigid body in a rotatory motion have axis of rotation:

(A) Passing from any point inside the object

(B) Passing from any point outside the object

(C) Passing from any point

(D) Passing from centre of mass of object

32. A wheel has angular acceleration of 3.0 rad/s^2 and an initial angular speed of 2.0 rad/s. In a time of 2s it has rotated through an angle (in radian) of

(A) 6 (B) 10 (C) 12 (D) 4

33. A block hangs from a string wrapped on a disc of radius 20 cm free to rotate about its axis which is fixed in a horizontal position. If the angular speed of the disc is 10 rad/s at some instant, with what speed is the block going down at that instant ?

(A) 4 m/s (B) 3 m/s

(C) 2 m/s (D) 5 m/s

34. From the theorem of perpendicular axes. If the lamina is in X- Y plane

(A) $I_x - I_y = I_z$ (B) $I_x + I_z = I_y$

(C) $I_x + I_y = I_z$ (D) $I_y + I_z = I_x$

35. The moment of inertia of a straight thin rod of mass M and length l about an axis perpendicular to its length and passing through its one end, is

(A) $Ml^2/12$ (B) $Ml^2/3$

(C) $Ml^2/2$ (D) Ml^2

(SECTION-B)

36. Three point masses each of mass m are placed at the corners of an equilateral triangle of side 'a'. Then the moment of inertia of this system about an axis passing along one side of the triangle is

(A) ma^2 (B) $3ma^2$

(C) $3/4\ ma^2$ (D) $2/3\ ma^2$

37. Two rings have their moments of inertia in the ratio 2 : 1 and their diameters are in the ratio 2 : 1. The ratio of their masses will be

(A) 2 : 1 (B) 1 : 2

(C) 1 : 4 (D) 1 : 1

38. If the moment of inertia of a disc about an axis tangential and parallel to its surface be I, then what will be the moment of inertia about the axis tangential but perpendicular to the surface

(A) $\frac{6}{5}$ I (B) $\frac{3}{4}$ I

(C) $\frac{3}{2}$ I (D) $\frac{5}{4}$ I

39. One circular ring and one circular disc, both are having the same mass and radius. The ratio of their moments of inertia about the axes passing through their centres and perpendicular to their planes. will be

(A) 1 : 1 (B) 2 : 1

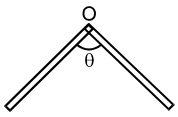
(C) 1: 2 (D) 4 : 1

40. The moment of inertia in rotational motion will be equivalent to …… as in linear motion :

(A) mass (B) velocity

(C) momentum (D) force

41. A thin rod of length L and mass M is bend at the middle point O as shown in figure. Consider an axis passing through two middle point O and perpendicular to the plane of the bent rod. Then moment of inertia about this axis is :



(A) $2/3\ mL^2$ (B) $1/3\ mL^2$

(C) $1/12\ mL^2$ (D) $1/24\ mL^2$

42. A circular disc is to be made using iron and aluminium. To keep its moment of inertia maximum about a geometrical axis, it should be so prepared that :-
(A) aluminium at interior and iron surrounds it
(B) iron at interior and aluminium surrounds it
(C) aluminium and iron layers in alternate order
(D) sheet of iron is used at both external surfaces and aluminium sheet as inner material

43. The ratio of the radii of gyration of a circular disc about a tangential axis in the plane of the disc and of a circular ring of the same radius about a tangential axis in the plane of the ring is
(A) 2 : 3 (B) 2 : 1
(C) $\sqrt{5} : \sqrt{6}$ (D) $1 : \sqrt{2}$

44. A body whose moment of inertia is 3 kg-m^2 is in rest. It is rotated for 20 sec by a torque of 6 Nm, angular displacement of the body will be :
(A) 400 radian (B) 200 radian
(C) 100 radian (D) 250 radian

45. When a mass is rotating in a plane about a fixed point, its angular momentum is directed along
(A) radius
(B) the tangent to the orbit
(C) a line perpendicular to the plane of rotation
(D) none of the above

46. Assertion: If there is no external torque on a body about its centre of mass, then the velocity of the center of mass remains constant.
because
Reason
The linear momentum of an isolated system remains constant.
(A) Assertion is True, Reason is True; Reason **is** a correct explanation for Assertion
(B) Assertion is True, Reason is True; Reason **is NOT** a correct explanation for Assertion
(C) Assertion is True, Reason is False
(D) Assertion is False, Reason is True.

47. **Assertion :** The work done by all forces on a system equals to the change in kinetic energy of that system. This statement is true even if nonconservative forces act on the system.
Reason : The total work done by internal forces may be positive.
(A) Assertion : is True, Reason : is True; Reason : is a correct explanation for Assertion :
(B) Assertion : is True, Reason : is True; Reason : is NOT a correct explanation for Assertion :
(C) Assertion : is True, Reason : is False
(D) Assertion : is False, Reason : is True.

48. Match the following
Column I
(A) Gravitational field intensity
(B) Gravitational potential
(C) Square of the period of planets revolving around the sun
(D) All planets are revolving around the sun
Column II
(p) Elliptical orbit
(q) Cube of semi major axis
(r) Gravitational force per unit mass
(s) Work done per unit mass
(A) A$\rightarrow$ p ; B $\rightarrow$ q ; C$\rightarrow$ r ; D$\rightarrow$ s
(B) A$\rightarrow$ r ; B $\rightarrow$ s ; C$\rightarrow$ q ; D$\rightarrow$ p
(C) A$\rightarrow$ q ; B $\rightarrow$ s ; C$\rightarrow$ p ; D$\rightarrow$ r
(D) A$\rightarrow$ s ; B $\rightarrow$ p ; C$\rightarrow$ r ; D$\rightarrow$ q

49. **Assertion :** At pole value of acceleration due to gravity (g) is greater than that of equator.
Reason : Earth rotates on its axis in addition to revolving round the sun.
(A) Assertion : is True, Reason : is True; Reason : is a correct explanation for Assertion :
(B) Assertion : is True, Reason : is True; Reason : is NOT a correct explanation for Assertion :
(C) Assertion : is True, Reason : is False
(D) Assertion : is False, Reason : is True.

50. If net force acting on system of particles is zero, choose an incorrect option regarding the motion of the mass of the system.
(A) Acceleration of COM will always be zero.
(B) Velocity of COM will always be zero.
(C) Both (A) and (B)
(D) None of these

CHEMISTRY

(SECTION-A)

51. A gas absorbs 200 J of heat and expands against the external pressure of 1.5 atm from a volume of 0.5 litre to 1.0 litre, Calculate the change in internal energy -
(A) 124 J (B) 224 J
(C) 114 J (D) 154 J

52. Heat of reaction for $C_6H_{12}O_6$ (s) + $6O_2$ (g) $\rightarrow$ $6CO_2$(g)+ $6H_2O$ (g)
at constant pressure is –651 kcal at 17ºC. Calculate the heat of reaction at constant volume at 17ºC-
(A) – 554.5 kcal (B) – 654.5 kcal
(C) – 354.5 kcal (D) – 154.5 kcal

53. A cooking gas cylinder is assumed to contain 11.2 kg isobutane. The combustion of isobutane is given by-

C_4H_{10} (g) + $\left(\frac{13}{2}\right)$ O_2 (g) $\rightarrow$ $4CO_2$ (g) + $5H_2O(\ell)$;
ΔH = – 2658 kJ
If a family needs 15000 kJ of energy per day for cooking, how long would the cylinder last ?
(A) 22 days (B) 28 days
(C) 32 days (D) 34 days

54. Calculate the entropy change in melting 1 mole of ice at 273K, ΔH_f° = 6.025 kJ/mole -
(A) 11.2 JK^{-1} mol^{-1} (B) 22.1 JK^{-1} mol^{-1}
(C) 15.1 JK^{-1} mol^{-1} (D) 5.1 JK^{-1} mol^{-1}

55. Determine the standard free energy change for the following reaction at 298 K.
N_2 (g) + $3H_2$(g) $\rightarrow$ $2NH_3$(g)
Given ΔG°_f for N_2(g) , H_2(g) and NH_3(g) are 0, 0 and -16.66 kJ mol^{-1}
(A) – 11.22 kJ (B) – 22.22 kJ
(C) – 33.32 kJ (D) – 44.44 kJ

56. For a gaseous reaction
$2A_2$(g) + $5B_2$(g) $\rightarrow$ $2A_2B_5$(g)
at 27ºC the heat change at constant pressure is found to be –50160 J. Calculate the value of internal energy change (ΔE). Given that R = 8.314 J/K mol.
(A) –34689 J (B) –37689 J
(C) –27689 J (D) –38689 J

57. Calculate the standard enthalpy change for a reaction CO_2(g) + H_2(g) $\rightarrow$ CO(g) + H_2O (g) given that ΔH_f^0 for CO_2(g), CO(g) and H_2O(g) as –393.5, –110.5 and –241.8 kJ/mol respectively.
(A) –31.2 kJ (B) – 21.2 kJ
(C) –11.2 kJ (D) + 41.2kJ

58. Calculate the work performed when 2 moles of hydrogen expand isothermally and reversibly at 25ºC from 15 to 50 litre.
(A) –1300.87 cal. (B) –1400.87 cal.
(C) –1426.87 cal. (D) +1426.87 cal.

59. At 25ºC for the combustion of 1 mole of liquid benzene the heat of reaction at constant pressure is given by,

C_6H_6 (ℓ) + $\frac{15}{2}$ O_2 (g) $\rightarrow$ $6CO_2$ (g)+ $3H_2O$ (ℓ) ; ΔH = –780980 cal.
What would be the heat of reaction at constant volume ?
(A) – 780086 cal. (B) + 780086 cal.
(C) – 780000 cal. (D) + 775086 cal.

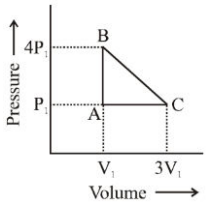
60. The enthalpy of fusion of ice is 6.02 kJ mol^{-1}. The heat capacity of water is 4.18 J g^{-1} C^{-1}. What is the smallest number of ice cubes at 0°C each containing one mole of water, that are needed to cool 500 g of liquid water from 20°C to 0°C ?
(A) 1 (B) 7
(C) 14 (D) 125

61. The bond dissociation energies for single covalent bonds formed between carbon and A, B, C, D and E atoms are :

Bond	Bond energy (kcal mol^{-1})
(i) C – A	240
(ii) C – B	382
(iii) C – D	276
(iv) C – E	486

This indicates that the smallest atom is :
(A) A (B) B (C) C (D) E

62. An ideal gas is taken around the cycle ABCA as:



(A) $12P_1V_1$ (B) $6P_1V_1$
(C) $3P_1V_1$ (D) P_1V_1

63. Consider the following two reactions :
(i) Propene + H_2 $\longrightarrow$ Propane ; ΔH_1
(ii) Cyclopropane + H_2 $\longrightarrow$ Propane; ΔH_2
Then, $\Delta H_2 - \Delta H_1$ will be :
(A) 0
(B) $2BE_{C-C} - BE_{C=C}$
(C) $BE_{C=C}$
(D) $2BE_{C=C} - BE_{C-C}$

64. 4.48 L of an ideal gas at S.T.P requires 12 calories to raise its temperature by 15C° at constant volume. The C_P of the gas is :
(A) 3 cal (B) 4 cal
(C) 7 cal (D) 6 cal

65. For a chemical reaction,
$2A_2(g) + 5B_2(g) \longrightarrow 2A_2B_5(g)$,
at 27ºC the difference between ΔH and ΔE is X.
Then the ratio X/R -
(A) Zero (B) Unity
(C) -5×10^0 (D) -1.5×10^3

66. One litre-atmosphere is approximately equal to-
(A) 19.2 J (B) 101 J
(C) 8.31 J (D) 831 J

67. Ammonium nitrate can decompose with explosion by the following reaction.
$NH_4NO_3(s) \rightarrow N_2O(g) + 2H_2O$;
$\Delta H = -37.0$ kJ/mol
Calculate the heat produced when 2.50 g of NH4NO3 decomposes -
(A) 1.06 kJ (B) 0.96 kJ
(C) 1.16 kJ (D) 1.26 kJ

68. The enthalpy of combustion of a substance -
(A) is always positive.
(B) is always negative.
(C) can be either zero or greater than zero.
(D) is unpredictable till calculations are done.

69. According to Hess's Law the thermal effect of a reaction depends on -
(A) initial concentration of reactants
(B) final condition of the reacting substance
(C) intermediate states of a reaction
(D) initial and final conditions of the reacting substances

70. Free energy change of reversible reaction at equilibrium is -
(A) Infinite (B) Zero
(C) Positive (D) Negative

71. Which one of the following is correct?
(A) $-\Delta G = \Delta H - T\Delta S$
(B) $\Delta H = \Delta G - T\Delta S$
(C) $\Delta S = \frac{1}{T}[\Delta G - \Delta H]$
(D) $\Delta S = \frac{1}{T}[\Delta H - \Delta G]$

72. In any natural process -
(A) The entropy of the universe remains constant
(B) The entropy of universe tends towards maximum.
(C) The entropy of universe tends towards minimum.
(D) Any of the above can happen

73. For the reaction between CO_2 and graphite $CO_2(g) + C(s) \rightarrow 2CO(g)$ $\Delta H = +170.0$ kJ and $\Delta S = 170$ J K^{-1}. The reaction is spontaneous at -
(A) 298 K (B) 500 K
(C) 900 K (D) 1200 K.

74. For which of the following substances, the standard heat of formation is zero :
(A) $C_{(graphite)}$ (B) $C_{(diamond)}$
(C) CO_2 (D) O_3

75. For the spontaneity of a reaction , which is true?
(A) ΔG = +ve, ΔH = + ve
(B) ΔH = +ve, ΔS = - ve
(C) ΔG = + ve, ΔH = - ve
(D) ΔH = - ve, ΔS = + ve

76. The quantity required to increase the temperature of a body by 1 Kelvin is called -
(A) specific heat
(B) water equivalent
(C) thermal capacity
(D) molar specific heat

77. "Heat cannot be itself flow from a body at lower temperature to a body at higher temperature" is a statement or consequence of –
(A) Conservation of momentum
(B) Conservation of mass
(C) First law of thermodynamics
(D) Second law of thermodynamics

78. During complete combustion of one mole of butane, 2658 kJ of heat is released. The thermochemical reaction for above change is :
(A) $2C_4H_{10}(g) + 13\ O_2(g) \rightarrow 8CO_2(g) + 10\ H_2O(\ell)$ $\Delta_C H = -2658.0$ kJ mol^{-1}
(B) $C_4H_{10}(g) + 13/2\ O_2(g) \rightarrow 4CO_2(g) + 5\ H_2O(\ell)$ $\Delta_C H = -1329.0$ kJ mol^{-1}
(C) $C_4H_{10}(g) + 13/2\ O_2(g) \rightarrow 4CO_2(g) + 5\ H_2O(\ell)$ $\Delta_C H = -2658.0$ kJ mol^{-1}
(D) $C_4H_{10}(g) + 13/2\ O_2(g) \rightarrow 4CO_2(g) + 5\ H_2O(\ell)$ $\Delta_C H = +2658.0$ kJ mol^{-1}

79. For hypothetical reaction?
$A(g) + B(g) \rightarrow C(g) + D(g)$
Which of the following statements is correct ?
(A) $\Delta H = \Delta E$ (B) $\Delta H > \Delta E$
(C) $\Delta H < \Delta E$ (D) unpredictable

80. Select the correct order in the following :
(A) 1 erg > 1 J > 1 cal
(B) 1 cal > 1 J > 1 erg
(C) 1 erg > 1 cal > 1 J
(D) 1 J > 1 cal > 1 erg

81. Which among the following is not a state function?
(A) Internal energy (B) Free energy
(C) Work (D) Enthalpy

82. In the combustion of 4 g. of CH_4, 2.5 kcal of heat is liberated. The heat of combustion of CH_4 is -
(A) 20 kcals (B) 10 kcals
(C) 2.5 kcals (D) 5 kcals

83. Enthalpy of formation of compound is -
(A) always positive
(B) always negative
(C) can be either negative or zero
(D) can be positive or negative

84. The enthalpies of elements in their standard states are taken as zero. The enthalpy of formation of a compound:
(A) is always negative
(B) may be positive or negative
(C) is always positive
(D) is never negative

85. A solution of 500 mL of 0.2 M KOH and 500 mL of 0.2 M HCl is mixed and stirred; the rise in temperature is T_1. The experiment is repeated using 250 mL of each solution, the temperature raised is T_2. Which of the following is true?
(A) $T_1 = T_2$ (B) $T_1 = 2T_2$
(C) $T_1 = 4T_2$ (D) $T_2 = 9T_1$

(SECTION-B)

86. The enthalpy of formation of ammonia is –46.0 kJ mol^{-1}. The enthalpy for the reaction $2N_2(g) + 6\ H_2(g) \rightarrow 4\ NH_3(g)$ is equal to -
(A) –46.0 kJ (B) 46.0 kJ
(C) 184.0 kJ (D) –184.0 kJ

87. Which of the following has highest entropy?
(A) Water (B) Graphite
(C) Mercury (D) Hydrogen

88. Calculate the temperature at which $\Delta G = -5.2$ kJ mol^{-1} $\Delta H = 145.6$ kJ mol^{-1} and $\Delta S = 216$ J K^{-1} mol^{-1} for a chemical reaction -
(A) 698°C (B) 425°C
(C) 650 K (D) 650°C

89. If the enthalpy of vapourisation of water is 186.5 J mol^{-1}, the entropy of its vaporisation will be-
(A) 0.5 J K^{-1} mol^{-1} (B) 1.0 J K^{-1} mol^{-1}
(C) 1.5 J K^{-1} mol^{-1} (D) 2.0 J K^{-1} mol^{-1}

90. A gas is allowed to expand at constant pressure from a volume of 1.0 litre to 10.0 litre against an external pressure of 0.50 atm. If the gas absorbs 250 J of heat from the surroundings, what are the values of q, w and ΔE? (Given 1 L atm = 101 J)

	q	w	ΔE
(A)	250 J	– 455 J	– 205 J
(B)	–250 J	– 455 J	– 710 J
(C)	250 J	455 J	710 J
(D)	–250 J	455 J	205 J

91. Which of the following state function is not zero at standard state?
(A) Enthalpy
(B) Entropy
(C) Free energy
(D) Entropy and enthalpy

92. Which law of thermodynamics helps in calculating the absolute entropies of various substances at different temperatures?
(A) First law (B) Second law
(C) Third law (D) Zeroth law

93. The product of combustion of an aliphatic thiol (R SH) at 298 K are :
(A) $CO_{2(g)}$, $H_2O_{(g)}$ and $SO_{2(g)}$
(B) $CO_{2(g)}$, $H_2O(\ell)$ and $SO_{2(g)}$
(C) $CO_{2(\ell)}$, $H_2O_{(\ell)}$ and $SO_{2(g)}$
(D) $CO_{2(g)}$, $H_2O(\ell)$ and $SO_{2(l)}$

94. An exothermic reaction has a large positive entropy change. The reaction will be -
(A) Possible $\rightarrow$ Spontaneous at all temperatures
(B) Possible $\rightarrow$ Spontaneous at low temperatures only
(C) Impossible $\rightarrow$ Non-spontaneous at all temperatures
(D) Possible $\rightarrow$ Spontaneous at high temperature only

95. The heat of formation of water is given by :
(A) $H_{2(g)} + \frac{1}{2}O_{2(g)} \longrightarrow H_2O(l); \Delta H = -68.3 kcal$
(B) $2H_{2(g)} + O_{2(g)} \longrightarrow 2H_2O(l); \Delta H = 136.6$ kcal
(C) $H_{2(g)} + \frac{1}{2}O_{2(g)} \longrightarrow H_2O_{2(g)}; \Delta H = -86$ kcal
(D) $H_{2(g)} + \frac{1}{2}O_{2(g)} \longrightarrow H_2O_{(l)}; \Delta H = +68.3$ kcal

96. The occurrence of reaction is impossible if :
(A) ΔH is +ve ; ΔS is +ve
(B) ΔH is –ve ; ΔS is –ve
(C) ΔH is –ve ; ΔS is +ve
(D) ΔH is +ve ; ΔS is –ve

97. **Assertion (A) :** Average velocity of gas molecules in a container moving in one dimension is zero.
Reason (R) : Gas molecules are uniformaly distributed in the container at any given condition.
(A) If both (A) and (R) are true, and (R) is the correct explanation of (A).
(B) If both (A) and (R) are true but (R) is not the correct explanation of (A).
(C) If (A) is true but (R) is false.
(D) If (A) is false but (R) is true.

98. **Assertion (A) :** Rate of effusion increases with the increase in temperature
Reason (R) : Rate of effusion increases with the increase in pressure
(A) If both (A) and (R) are true, and (R) is the correct explanation of (A).
(B) If both (A) and (R) are true but (R) is not the correct explanation of (A).
(C) If (A) is true but (R) is false.
(D) If (A) is false but (R) is true.

99. **Assertion :** Kinetic energy of photoelectrons is directly proportional to the intensity of the incident radiation.
Reason : Each photon of light causes the emission of only one photo electron.
(A) If both (A) and (R) are true, and (R) is the correct explanation of (A).
(B) If both (A) and (R) are true but (R) is not the correct explanation of (A).
(C) If (A) is true but (R) is false.
(D) If (A) is false but (R) is true.

100. **Assertion :** An exothermic reaction in principle cannot have zero activation energy.
Reason : In exothermic reaction Σ H (Products) < Σ H (Reactants).
(A) If both (A) and (R) are true, and (R) is the correct explanation of (A).
(B) If both (A) and (R) are true but (R) is not the correct explanation of (A).
(C) If (A) is true but (R) is false.
(D) If (A) is false but (R) is true.

BIOLOGY

BOTANY (SECTION-A)

101. Name the family having (9) +1 arrangement of stamens
(A) Solanaceae (B) Fabaceae
(C) Liliaceae (D) Asteraceae

102. In which of the following plants, primary root is ephemeral and new roots originate from the base of stem?
(A) Banyan tree (B) Wheat
(C) Mango (D) Rhizophora

103. Which one is not related to roots in monocotyledons plants?
(A) The primary root is short lived.
(B) Root never originates from the radicle part of embryo.
(C) Presence of fibrous root system.
(D) Roots originate from the base of the stem.

104. Root hairs develop from
(A) Region of maturation.
(B) Region of elongation.
(C) Region of cell division
(D) Meristematic zone.

105. The region of root tip whose cells undergo rapid elongation and enlargement and are responsible for the growth of the root in length is called the
(A) Region of maturation.
(B) Region of elongation.
(C) Region of meristematic activity.
(D) Root hairs.

106. Read the following statements about stem and identify them as true (T) or false (F).
(A) Ascending part of plant axis.
(B) Develops from radicle of the embryo of a germinating seed.
(C) Generally green when older but brown when young.
(D) It may preform function of vegetative propagation.

	A	B	C	D
(A)	T	F	F	T
(B)	T	T	F	T
(C)	T	T	F	F
(D)	T	F	F	F

107. The main plant body of bryophytes is
A. More differentiated than algae
B. Lacked true roots, stem or leaves
C. Gametophytic that usually occurs in damp, humid and shaded localities
D. Prostrate or erect and attached to substratum by unicellular or multicellular rhizoids
The correct options are
(A) Only (A), (B) and (C)
(B) Only (A) and (C)
(C) Only (B), (C) and (D)
(D) All (A), (B), (C) and (D)

108. In a moss, the sporophyte
(A) Is partially dependent on photosynthetic gametophyte
(B) Produces gametes that give rise to gametophyte
(C) Develops from germination of spore
(D) More than one option is correct

109. Compositae is also known as
(A) Fabaceae (B) Poaceae
(C) Liliaceae (D) Asteraceae

110. The spread of living pteridophytes is limited and restricted to narrow geographical region because of
(A) Requirement of water by male and female gametes for fertilization
(B) Gametophytes require cool, damp and shady places to grow
(C) Development of two kind of spores
(D) All except

111. In family Gramineae, the inflorescence is
(A) Spike of spikelet (B) Verticellaster
(C) Hypanthodium (D) Capitulum

112. Leaves are modified into spines and stems become fleshy and flattened to carry out photosynthesis. Such modified stem is present in
(A) Opuntia.
(B) Euphorbia.
(C) Mangrove plant.
(D) Both (A)and (B).

113. Four sepals arranged in two whorls is characteristic of family
(A) Solanaceae
(B) Fabaceae
(C) Brassicaceae (Cruciferae)
(D) Liliaceae.

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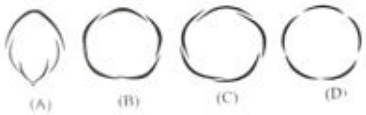
114. Select the option that is correct for the description of subaerial modification.
A. A slender lateral branch arises from the base of the main axis and, after growing aerially for some time, arches downwards to touch the ground.
B. A lateral branch originates from the basal and underground portion of the main stem, grows horizontally beneath the soil, and comes out obliquely upwards, giving rise to leafy shoot.

	A	B
(A)	Sucker	Runner
(B)	Runner	Stolon
(C)	Stolon	Sucker
(D)	Stolon	Offset

115. Opposite phyllotaxy of leaves is found in
(A) Mustard, sunflower.
(B) Guava, China rose.
(C) Calotropis, guava.
(D) Nerium, Alstonia.

116. Read the following statements and select the correct option.
A. Veins provide rigidity to the leaf blade and act as the channel of transport for water, minerals, and food materials
B. Leaves of most of the dicotyledonous plants bear veins that run parallel to each other within a lamina.
(A) Only (A) is incorrect.
(B) Only (B) is incorrect.
(C) Both (A) and (B) are incorrect.
(D) Both (A) and (B) are correct.

117. The aestivation in petals of China rose and Gulmohar plants can be shown, respectively, by



(A) B and A (B) C and B
(C) C and D (D) D and C

118. Flowers can be divided into two equal radial halves in any radial plane passing through the centre in
(A) Pea and bean.
(B) Datura and chilli.
(C) Canna and Gulmohar.
(D) Gulmohar and cassia

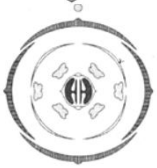
119. In the members of family malvaceae, anthers are described as
(A) Diadelphous and dithecous
(B) Diadelphous and monothecous
(C) Monadelphous and dithecous
(D) Monadelphous and monothecous

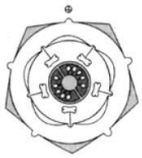
120. All are true for endosperm, except
(A) It is formed as a result of double fertilization.
(B) Food-storing tissue in castor.
(C) Present in the mature monocotyledonous seeds.
(D) It is bulky and stores food in orchids.

121. Floral diagram of the family to which Tulip and Gloriosa belong is

(A)

(B)

(C) 

(D) 

122. Select the correct option for the floral formula of the plant which has the following features:
(i) Zygomorphic, bisexual flowers
(ii) Petals five with vexillary aestivation
(iii) Ten stamens arranged in diadelphous condition
(iv) Gynoecium monocarpellary superior ovary
(A) $\oplus\varphi\mathrm{K}_{(5)}\mathrm{C}_{1+2+(2)}\mathrm{A}_{(9)+1}\underline{\mathrm{G}}_{1}$
(B) $\%\varphi\mathrm{K}_{(5)}\mathrm{C}_{1+2+(2)}\mathrm{A}_{(9)+1}\underline{\mathrm{G}}_{1}$
(C) $\%\varphi\mathrm{K}_{(5)}\mathrm{C}_{1+2+(2)}\mathrm{A}_{(5)+(5)}\underline{\mathrm{G}}_{1}$
(D) $\oplus\varphi\mathrm{K}_{(5)}\mathrm{C}_{1+2+(2)}\mathrm{A}_{(5)+(5)}\underline{\mathrm{G}}_{1}$

123. At places, the cork contains aerating pores called
(A) Stomata.
(B) Lenticels.
(C) Hydathode.
(D) Pneumatothodes.

124. The cork cambium, cork, and secondary cortex are collectively called
(A) Phelloderm. (B) Phellogen.
(C) Periderm. (D) Polyderm.

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125. Select the incorrectly matched pair:
(A) Psilopsida - Psilotum
(B) Lycopsida - Selaginella
(C) Sphenopsida - Dryopteris
(D) Pteridopsida - Adiantum

126. Which of the following is/are phanerogame(s) without ovary?
(A) Ephedra
(B) Zea mays
(C) Ginkgo
(D) Both (A) and (C)

127. Which of the following structure is not present in Cycas?
(A) Unbranched stem (B) Coralloid roots
(C) Pinnate leaves (D) Female cone

128. Both male and female gametophytes do not show free living existence in
(A) Phanerogams
(B) Gymnosperms only
(C) Pteridophytes
(D) Bryophytes

129. Sunflower is included in angiosperms because
(A) It is heterosporous
(B) Seeds are protected by seed coat
(C) Seeds are enclosed in fruits
(D) All except

130. Vascular bundles of leaf are similar to
(A) Vascular bundles of dicot root.
(B) Vascular bundles of monocot root.
(C) Vascular bundles of dicot stem.
(D) Vascular bundles of monocot stem.

131. The vascular bundles in Cucurbita stem are
(A) Radial (B) Bi-collateral
(C) Collateral (D) Concentric

132. Exarch type of arrangement of primary xylem is seen in
(A) Roots (B) Dicot stem
(C) Isobilateral leaf (D) Monocot stem

133. Select the correct statement with respect to phloem fibres.
A. Generally absent in primary phloem.
B. Much elongated unbranched with needle-like apices.
C. Sclerenchymatous in nature.
D. Becomes dead at maturity.
(A) (A) and (B) only
(B) (B) and (C) only
(C) (B) and (D) only
(D) (A), (B), (C), and (D)

134. During the formation of primary plant body, specific regions of meristem produce
(A) Epidermal tissue (B) Ground tissue
(C) Vascular tissue (D) All of these

135. Apical meristem of the root is present
(A) Only in radicle.
(B) Only in tap roots.
(C) Only in adventitious roots
(D) In all the roots.

(SECTION-B)

136. Intercalary meristems
(A) Are found in between mature tissues.
(B) Are lateral meristem.
(C) Are primary meristem.
(D) More than one option is correct.

137. Ground tissue includes
(A) Cortex and pericycle
(B) Medullary rays.
(C) Pith.
(D) All of these

138. Which of the following is not a part of stele?
(A) Endodermis (B) Pith
(C) Pericycle (D) Vascular tissue

139. Artificial system of classification given by Carolus Linnaeus was mainly based on
(A) Habit and habitat
(B) Gross morphology
(C) Vegetative characters
(D) Androecium character

140. Phylogenetic system of classification was given by all except
(A) Engler and Prantl (B) Aristotle
(C) Takhtajan (D) Eichler

141. Kelps are
(A) Massive brown algae
(B) Amphibians of plant kingdom
(C) Simple thalloid filamentous brown algae
(D) Red algae with massive plant body

142. Which of the following organisms shows anisogamy?
(A) Ulothrix (B) Spirogyra
(C) Udorina (D) Fucus

143. Select incorrectly matched pair
(A) Iodine source - Laminaria
(B) Agar - Gelidium and Gracilaria
(C) Carrageen - Fucus
(D) Space travelers food supplement - Chlorella

144. Agar, one of the commercial products
A. Is obtained from cell wall of certain red algae
B. Is used to grow microbes
C. Is used in preparation of ice cream and jellies Choose the correct option:
(A) Only (B) is correct
(B) Only (A) and (C) are correct
(C) Only (B) and (C) are correct
(D) All (A), (B) and (C) are correct

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145. Which is not true about phellogen?
(A) It is extra stelar cambium.
(B) It is formed by redifferentiation of cortical cells in dicot roots.
(C) It is made up of narrow, thin-walled nearly rectangular cells.
(D) It is also known as cork cambium.

146. Secondary growth
(A) Helps in increase in girth or diameter of plant organ
(B) Occurs due to the activity of procambium.
Select the correct option.
(A) Only (A) is correct.
(B) Only (B) is correct.
(C) Both (A) and (B) are correct.
(D) Both (A) and (B) are incorrect.

147. The dorsiventral leaf of plant has
(i) Conspicuous cuticle present on both epidermises.
(ii) Palisade tissue towards abaxial epidermis and spongy parenchyma towards adaxial epidermis.
(iii) Bulliform cells in adaxial epidermis.
(iv) Vascular bundles surrounded by a layer of thick- walled bundle sheath cells.
Correct statements are
(A) Only (ii) (B) (i) and (iv)
(C) (ii), (iii), and (iv) (D) (i), (iii), and (iv).

148. Which of the following characters is/are related dorsiventral leaf?
(i) Stomata are present onadaxial epidermis. Abaxial epidermis to
(ii) Mesophyll is differentiated into palisade tissue and spongy parenchyma.
(iii) Certain adaxial epidermis cells along the vein modify themselves into large empty colourless cells.
(A) Only (iii) (B) (i) and (ii)
(C) Only (ii) (D) (i), (ii), and (iii)

149. The ovary is half inferior in :
(A) Plum (B) Brinjal
(C) Mustard (D) Sunflower

150. Read the following statements about the vascular bundles:
(a) In roots, xylem and phloem in a vascular bundle are arranged in an alternate manner along the different radii.
(b) Conjoint closed vascular bundles do not possess cambium.
(c) In open vascular bundles, cambium is present in between xylem and phloem.
(d) The vascular bundles of dicotyledonous stem possess endarch protoxylem.
(e) In monocotyledonous root, usually there are more than six xylem bundles present.
Choose the correct answer from the options given below :

Options were not academically correct, so rectified.
(A) (b), (c), (d) and (e) Only
(B) (a), (b), (c), (d) and (e)
(C) (a), (c), (d) and (e) Only
(D) (a), (b) and (d) Only

ZOOLOGY (SECTION-A)

151. RBCs of frog are
(A) Biconvex and nucleated
(B) Biconcave and nucleated
(C) Biconvex and enucleated
(D) Biconcave and enucleated

152. Identify the wrong statement:
(A) Skull of frog is dicondylic.
(B) Typical vertebrae of frog (2nd-7th) are procoelous.
(C) Frog has 12 pairs of cranial nerves.
(D) Skin of frog remains moist due to mucus glands.

153. Rana tigrina
(A) is ureotelic
(B) has mesonephric kidney
(C) has uriniferous tubules in kidney
(D) has all of the above characters

154. The alimentary canal of frog is
(A) Long since it is herbivore
(B) Short because it is carnivore
(C) Incomplete since anus is absent
(D) Short because it is herbivore

155. Function of stomodaeal valve in the gut of cockroach is to prevent entry of food from
(A) Hindgut to midgut
(B) Midgut to foregut
(C) Oesophagus to crop
(D) Rectum to colon

156. The prothoracic gland in cockroach produces
(A) Juvenile hormone
(B) Ecdysone
(C) Moulting hormone
(D) Both (B) and (C)

157. Read the following statements:
(i) Head is triangular in shape and lies anteriorly at right angles to the longitudinal axis.
(ii) Head is formed by fusion of nine segments and has restricted mobility.
(iii) The entire midgut of cockroach is lined by cuticle.
(iv) Antennae of cockroach has sensory receptors for monitoring the environment.
(v) Mushroom glands are present in 4th-6th abdominal segment in male cockroach.
Which of the above statements are correct?
(A) (i) and (iii) (B) (ii) and (v)
(C) (iv) and (v) (D) (i) and (iv)

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158. The type of metamorphosis observed in cockroach is
(A) Hemimetabolous
(B) Paurometabolous
(C) Holometabolous
(D) Hypermetabolus

159. The earthworm dies due to if its skin tus dry.
(A) Suffocation
(B) Starvation
(C) Toxicity
(D) All of the above

160. Clitellum of earthworm helps in
(A) Secreting mucus
(B) Cocoon formation
(C) Locomotion
(D) Copulation

161. Circulatory system of earthworm consists of
(A) Closed blood vessels with definite walls
(B) Open blood vessels with definite walls
(C) Closed blood vessels without walls
(D) Open blood vessel without walls

162. Consider the following statements:
(i) The body wall of earthworm is covered externally by a thin, non-cellular cuticle, below which lies epidermis.
(ii) The epidermis of earthworm is made up of a single layer of columnar epithelial cells which contain
secretory gland cells.
(iii) The setae are present in all segments of the body of earthworm.
(iv) Septal nephridia are present in first 14 segments in Pheretima.
Which of the above statements are correct?
(A) (i) and (ii) (B) (ii) and (iii)
(C) (iii) and (iv) (D) (i) and (iv)

163. The flow of blood in dorsal blood vessel of earthworm is
(A) Backwards
(B) Forwards
(C) Forwards in anterior half only
(D) None of these

164. Which of the following is an incorrect statement w.rt. intestine in earthworm?
(A) It extends from 15th till last segment.
(B) It has calciferous glands to neutralize humic acid.
(C) It has typhlosole to increase absorptive area.
(D) Intestinal caecae attached to intestine secrete digestive juices.

165. The chloragogen cells of coelomic fluid in earthworm are analogous with of vertebrates.
(A) Liver (B) Kidney
(C) Heart (D) Brain

166. Which of the following in an incorrect option w.r.t. myelinated neuron?
(A) Neurilemma is continuous.
(B) Myelin is continuous.
(C) Nodes of Ranvier are present.
(D) Nissl bodies are present in soma.

167. The grey matter of brain has
(A) Myelinated axons (B) Cyton
(C) Dendrites (D) Both (B) and (C)

168. Identify the wrong statement:
(A) The conduction velocity of myelinated neuron is faster than the non-myelinated neuron.
(B) The cell body of neuron is also called cyton.
(C) Nissl bodies are present in axon.
(D) Neurotransmitters are chemical that float across the synapse to give message to the dendrites or cell bodies of other neurons.

169. Each skeletal muscle fibre is surrounded by a f connective tissue sheath called
(A) Epimysium (B) Endomysium
(C) Perimysium (D) Endoneurium

170. Identify true (T) and (F) among the following statements and choose the correct option:
(i) Smooth muscle fibers are uninucleate and involuntary.
(ii) Due to presence of very few gap junctions, the cardiac muscles contract together as a unit.
(iii) Skeletal muscles fibers are syncytial and appear striated.
(iv) Smooth muscle fibers have striations and appear fusiform.

	(i)	(ii)	(iii)	(iv)
(A)	T	T	F	F
(B)	T	F	T	F
(C)	F	T	F	T
(D)	T	T	T	F

171. Read the following statements and choose the correct option:
Statements I : The newborn mammals do not shiver in spite of lower temperature outside the mother's womb.
Statement II : Newborns have brown fat that contains many mitochondria with uncoupling proteins and have a large capacity of generating heat.
(A) Both statements are correct
(B) Both statements are incorrect
(C) Only statement I is correct
(D) Only statement II is correct

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172. Which of the following is correct w.r.t. difference between RBCs of humans and frog?
(A) Frog's RBCs are non-nucleated.
(B) Human RBCs are biconvex, while frog's RBCs are biconcave.
(C) Human RBCs are biconcave, while frog's RBCs are biconvex.
(D) Human RBCs are nucleated.

173. In a compact bone, the concentric layers of matrix are called
(A) Lacunae
(B) Lamellae
(C) Haversian canal
(D) Volkmann's canal

174. A large multinucleated cell involved in resorption of cartilage is called
(A) Chondroclast (B) Chondroblast
(C) Osteoblast (D) Chondrocyte

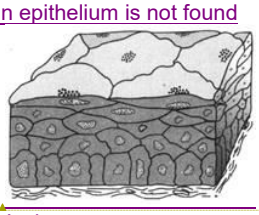
175. Mark the wrong statement:
(A) The intercellular material of cartilage is solid, pliable and resists compression.
(B) Chondrocytes are enclosed in small cavities within the matrix secreted by them.
(C) Cartilage is the site of production of blood cells.
(D) Most of the cartilage in vertebrate embryos are replaced by bone in adults.

176. Red bone marrow is found mainly in
(A) Marrow cavity
(B) Spongy bone
(C) Ends of long bones
(D) Both (B) and (C)

177. Ependymal cells have ciliated simple columnar shape and are found in the lining of
(A) CSF-filled ventricles of brain
(B) Central canal of spinal cord
(C) Both (A) and (B)
(D) Auditory canal

178. The wall of urinary bladder and ureter is lined by epithelium.
(A) Simple columnar
(B) Germinal
(C) Transitional
(D) Stratified squamous

179. Choose the correct location where the given epithelium is not found



(A) Vagina
(B) Skin
(C) Buccal cavity
(D) Bowman's capsule

180. Consider the following statements:
(i) Goblet cells are the unicellular glands.
(ii) The products of exocrine glands are hormones and
are secreted directly into the fluid bathing the gland.
(iii) Some of the squamous cells get specialized for secretion and are called glandular epithelium.
(iv) Compound epithelium is made of more than one layer of cells and thus has a limited role in secretion and absorption.
Which of the above statements are correct?
(A) (i) and (ii) (B) (ii) and (iii)
(C) (iii) and (iv) (D) (i) and (iv)

181. The cell junction specialized for rapid transfer of ions and molecules is
(A) Adhering junction
(B) Hemidesmosome
(C) Gap junction
(D) Tight junction

182. Identify the diagram of the connective tissue given below and choose the correct option:

(A) Dense regular connective tissue
(B) Dense irregular connective tissue
(C) Areolar tissue
(D) Specialized connective tissue

183. During muscle contraction
(A) Mechanical energy is changed into chemical energy
(B) Chemical energy is changed into mechanical energy
(C) Potential energy is changed into chemical energy
(D) Mechanical energy is changed into potential energy

184. Which of the following is correct w.r.t. nodes of Ranvier?
(A) They are covered with myelin.
(B) Axolemma is discontinuous.
(C) Myelin sheath is discontinuous.
(D) Both neurilemma and myelin sheath are discontinuous.

185. A dense layer of connective tissue that surrounds the entire nerve, made of number of fasciculi, is called
(A) Epineurium (B) Endoneurium
(C) Perineurium (D) Epimysium

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(SECTION-B)

186. Identify the correct option w.r.t. unipolar neuron:
(A) Cell body with many dendrites
(B) Cell body with only an axon
(C) Cell body with no axon
(D) Cell body with a dendrite and an axon

187. The earthworm dies due to _____ if its skin turns dry.
(A) Suffocation
(B) Starvation
(C) Toxicity
(D) All of the above

188. One common feature of trachea of cockroach and that of rabbits is that
(A) Both are lined with ciliated epithelium
(B) Both have non-collapsible wall
(C) Both have cartilaginous rings in wall
(D) Both are paired and branched

189. Which of the following is correct for epithelial tissue?
(A) It is present only as inner lining
(B) It is present only as outer lining
(C) Contains very less intracellular matrix
(D) All of these

190. Which of the following sites contain squamous epithelium as its living?
(A) Blood vessel
(B) Air sac in lungs
(C) Nasal cavity
(D) Both (A) and (B)

191. In columnar epithelium, where is nucleus located?
(A) At the base
(B) In the middle
(C) At the top
(D) No nucleus is present

192. Which of the following is unicellular glandular epithelium?
(A) Salivary gland
(B) Islets of langer han's
(C) Goblet cells
(D) All of these

193. Which of the following functions of compound epithelium is minimal?
(A) Protection
(B) Secretion
(C) Absorption
(D) Both (B) and (C)

194. What kind of tissue is goblet cells?
(A) Epithelial tissue
(B) Connective tissue
(C) Neural tissue
(D) All of these

195. **Assertion:** Intercalated discs are important regions of cardiac muscle cells.
Reason: Intercalated discs function as communication junction for muscle contraction waves.
(A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
(B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
(C) If the assertion is true but the reason is false.
(D) If both the assertion and reason are false.

196. **Assertion:** Neurons are said to possess the property of excitability.
Reason: Neurons can get excited by a given stimulus.
(A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
(B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
(C) If the assertion is true but the reason is false.
(D) If both the assertion and reason are false.

197. Which of the following is present between the adjacent bones of the vertebral column?
(A) Cartilage
(B) Aerolar tissue
(C) Smooth muscle
(D) Intercalated discs

198. Which of the following is not a connective tissue?
(A) Adipose tissue (B) Cartilage
(C) Neuroglia (D) Blood

199. Tegmina in cockroach, arises from:
(A) Mesothorax
(B) Metathorax
(C) Prothorax and Mesothorax
(D) Prothorax

200. Match list - I with the list - II.

List-I		List-II	
(a)	Bronchioles	(i)	Dense Regular Connective Tissue
(b)	Goblet Cell	(ii)	Loose Connective Tissue
(c)	Goblet Cell	(iii)	Glandular Tissue
(d)	Adipose Tissue	(iv)	Ciliated Epithelium

Choose the correct answer from the options given below:
(A) (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)
(B) (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii)
(C) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)
(D) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)

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