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Test Series [Option-1] for NEET-2023

MM : 720 **Time : 3 hrs. 20 min.**

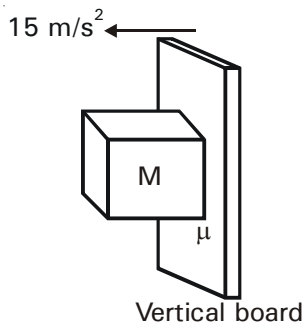
Full Syllabus -XI

PHYSICS : SECTION-A

All questions are compulsory in section A

1. A man can swim in still water at a speed of 5 km/hr. He wants to cross a river 0.6 km wide, flowing at the rate of 4 km/hr. If he heads in a direction making an angle of 127° with stream direction, then he will reach a point on the other bank
   (1) upstream at a distance of 0.15 km
   (2) downstream at a distance of 0.15 km
   (3) directly on the other side of the bank
   (4) never reach the other bank

2. The quantity $\sqrt{\frac{nh}{2\pi qB}}$ where n is a positive integer, h is Planck's constant, q is charge and B is magnetic field, has the dimensions of
   (1) area (2) speed
   (3) length (4) acceleration

3. 

   In the above situation, the block will just remain in contact with the board if the value of μ is
   (1) 1 (2) $\frac{1}{2}$
   (3) $\frac{2}{3}$ (4) $\frac{3}{2}$

4. An ideal heat engine working between temperature T_1 and T_2 has an efficiency 40%. The new efficiency if the source temperature is doubled, will be
   (1) 60% (2) 80%
   (3) 70% (4) 66.6%

5. The string of pendulum of length L is displaced through 90° from the vertical and released. Then the minimum strength of the string in order to withstand tension, as the pendulum passes through the mean position is

(1) mg (2) 3 mg
(3) 5 mg (4) 6 mg

6. A liquid completely fills a container with negligible expansion coefficient. On heating the liquid by 40°C, $(1/60)^{th}$ of its mass overflows. Coefficient of volume expansion of liquid is

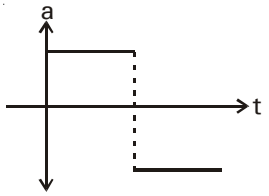
(1) $6.67 \times 10^{-4}/°C$ (2) $3.6 \times 10^{-4}/°C$
(3) $4.2 \times 10^{-4}/°C$ (4) $2.1 \times 10^{-4}/°C$

7. Consider a vector $\vec{F} = 4\hat{i} - 3\hat{j}$. Another vector that is perpendicular to $\vec{F}$ is

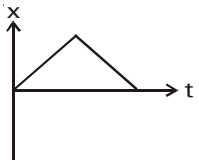
a. $4\hat{i} + 3\hat{j}$ b. $6\hat{i}$
c. $7\hat{k}$ d. $3\hat{i} + 4\hat{j}$

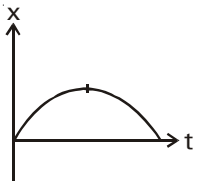
(1) both a & b (2) both c & d
(3) both a & c (4) d only

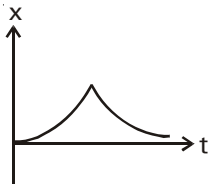
8. A particle is moving on a straight line and its acceleration time graph is as follows

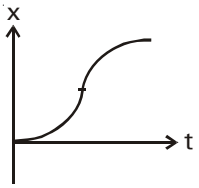


Corresponding distance time graph will be

(1) 

(2) 

(3) 

(4) 

9. A particle lies on a rough horizontal plate, rotating with constant angular velocity ω about a fixed vertical axis, at a distance 30cm from the axis. Coefficient of friction between the plate and the particle is 0.25. The largest value of ω for which the particle will not slip on the revolving plate is

(1) 3.3 rad/s (2) 2.9 rad/s
(3) 6.7 rad/s (4) 8.3 rad/s

10. Speed with which earth have to rotate on its axis so that a person on equator weigh $\frac{1}{2}$ as much as the present, is

(1) $\sqrt{\frac{3g}{5R}}$ rad/s (2) $\sqrt{\frac{2g}{5R}}$ rad/s

(3) $\sqrt{\frac{g}{2R}}$ rad/s (4) $\sqrt{\frac{2g}{R}}$ rad/s

11. A particle collides elastically head on with a stationary particle of mass 5 times its own. The fraction of the total energy retained by the striking particle is

(1) 0.2 (2) 0.11
(3) 0.22 (4) 0.44

12. For a gas if $\gamma = 1.4$, then C_P and C_V of the gas are respectively

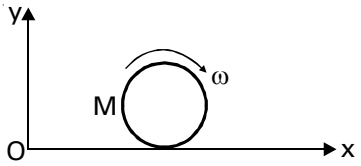
(1) $\frac{5}{2}R ; \frac{3}{2}R$ (2) $\frac{7}{2}R ; \frac{5}{2}R$

(3) 3 R ; 2 R (4) $\frac{7}{2}R ; \frac{3}{2}R$

13. Which of the following mathematical operations are correct with due regard to significant figures?

a. 10.2 cm + 8 cm = 18.2 cm
b. 2.53 m – 1.2 m = 1.33 m
c. 4.2 m × 1.4 m = 5.88 m^2
d. $\frac{3.6\ m}{1.75\ s} = 2.1$ m/s

(1) both a & d (2) both b & c
(3) d only (4) a, b & c

14. 

A ring of mass M and radius R is rolling with angular speed ω on a horizontal plane as shown. The magnitude of angular momentum of the ring about the point (0,2R) is

(1) $0.5\ MR^2\omega$ (2) $MR^2\omega$
(3) zero (4) $2MR^2\omega$

15. The kinetic energy of a particle executing S.H.M. is 16 J when it is in its mean position. If the amplitude of oscillations is 25 cm and the mass of the particle is 5.12 kg, the time period of its oscillation (in second) is

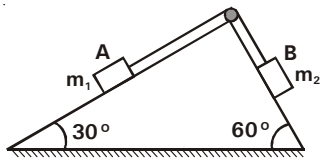
(1) 0.2π (2) 2π
(3) 20π (4) 5π

16. A cylinder of fixed capacity 67.2 litre contains helium gas at standard temperature and pressure. What is the amount of heat needed to raise the temperature of the gas in the cylinder by 15°C? ($R = 8.3\ mol^{-1}\ K^{-1}$)

(1) 374 J (2) 436 J
(3) 934 J (4) 560 J

17. Two cars, separated by distance of 4 km, are moving in same direction with speed of 36 km/hour. Speed of a car moving in opposite direction if it meets two cars at an interval of 4 minutes is

(1) 48 km/hr (2) 12 km/hr
(3) 24 km/hr (4) 36 km/hr

18. 

Find approximate acceleration of block A and B connected by an inextensible string as shown in figure. Pulley is assumed to be frictionless. Given $m_1 = 1$ kg and $m_2 = 4$ kg.

(1) $5\ m/s^2$ (2) $4\ m/s^2$
(3) $8\ m/s^2$ (4) $6\ m/s^2$

19. **Assertion** : Doppler shift in frequency if present changes with change in the velocity of air.
Reason : Speed of sound changes when air is moving.

(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

20. A body of mass 'm' is attached to one end of a massless spring which is suspended vertically from a fixed point. The mass is held in hand so that the spring is neither stretched nor compressed. Suddenly the support of the hand is removed. The lowest position attained by the mass during oscillation is 5 cm below the point where it was held in hand. Frequency of oscillation is about

(1) 3.2 Hz (2) 3.6 Hz
(3) 4.2 Hz (4) 1.8 Hz

21. A satellite of mass 'm' is revolving round the earth at a height 2R above the surface of the earth. If 'g' is the gravitational field intensity at the earth surface and R is the radius of the earth, the kinetic energy of the satellite will be

(1) mg R/4 (2) mg R/5
(3) mg R/2 (4) mg R/6

22. A spherical black body with a radius of 10cm radiates 1kW power at 127 °C. If the radius of another black body is 30 cm and the temperature 527 °C, the power radiated by it would be

(1) 225 kW (2) 324 kW
(3) 144 kW (4) 625 kW

23. A 0.2 kg ball is thrown up with an initial speed 16 m/s and reaches a maximum height of 10 m. How much energy is dissipated by air drag acting on the ball during the ascent?

(1) 20 J (2) 5.6 J
(3) 8.4 J (4) 4.8 J

24. An air bubble of radius 1cm in water has an upward acceleration 9.8 cms^{-2}. The density of water is 1g cm^{-3} and water offers a negligible drag on the bubble. The mass of the bubble is [Take $g = 980 cm/s^2$]

(1) 4.15 gram (2) 3.22 gram
(3) 5.23 gram (4) 2.09 gram

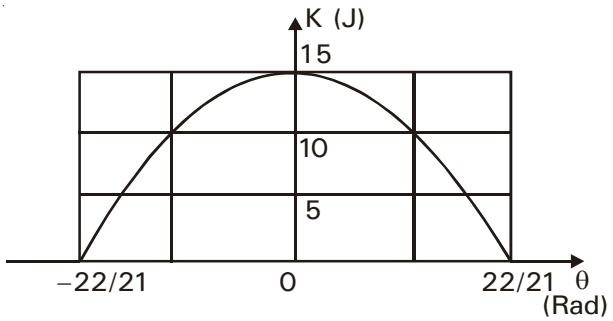
25. A stone falls from rest. The total distance covered by it in the last second of its motion is equal to the distance covered in the first four seconds. The approximate height from which the stone was dropped is

(1) 320 m (2) 250 m
(3) 425 m (4) 360 m

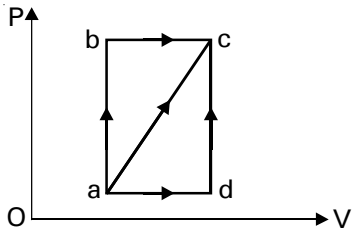
26. The displacement y (in cm) produced by a simple harmonic wave is $y = 10\sin(30\pi t - 5\pi x)$ where time is in seconds and x in meters. Maximum velocity of the particles in the medium will be

(1) 9.4 m/s (2) 8.6 m/s
(3) 12.3 m/s (4) 10.4 m/s

27. Figure shows the kinetic energy K of a simple pendulum versus its angle θ from the vertical. The pendulum bob has a mass 2 kg. The length of pendulum is equal to ($g = 10\ m/s^2$)

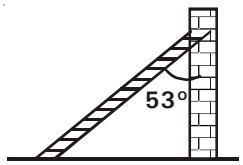


(1) 2.0 m (2) 1.8 m
(3) 1.5 m (4) 1.2 m

28. 

In the above figure,
$P_a = 0.2$ atm, $P_b = 0.6$ atm,
$V_a = 1$ litre and $V_d = 4$ litres
500J of heat is added to the system 'ab' and 100J of heat is added to the system in process 'bc'. The change in internal energy in process 'ac' is

(1) 180 J (2) 600 J
(3) 540 J (4) 420 J

29. 

A uniform ladder of mass 10 kg leans against a smooth vertical wall making an angle of 53° with it. Other end rests on a rough horizontal floor. Frictional force that floor exerts on ladder is

(1) 67 N (2) 60 N
(3) 100 N (4) 87 N

30. The equation of trajectory of a projectile (in SI units) in uniform gravitational field is $y = x - 0.5x^2$. The height reached is

(1) 1 m (2) 2 m
(3) 3 m (4) 0.5 m

31. Air is streaming past a horizontal air plane wing such that its speed is 120 m/s over the upper surface and 90 m/s below the lower surface. If the density of air is 1.3 kg/m^3, then the difference of the pressure on the two sides of the wing is

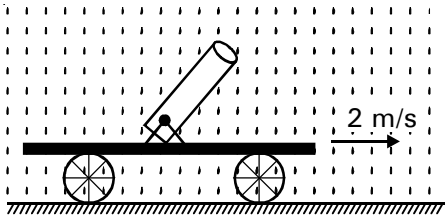
(1) 4095 Pa (2) 2100 Pa
(3) 6090 Pa (4) zero

32. **Statement-I** : A projectile thrown with speed 'v' at an angle θ has a range R on the surface of earth. For same v and θ, its range on the surface of moon will be 6 R.

Statement-II : In javelin throw, athlete throws the javelin at an angle 45° with horizontal.

(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

33.



A pipe which can rotate in a vertical plane is mounted on a cart moving uniformly as shown. At what angle to the horizontal should the pipe be placed so that drops of rain falling vertically with a velocity 2.66 m/s hit the base of the pipe without touching the walls?

(1) 37° (2) 53°
(3) 30° (4) 60°

34. A tuning fork vibrating with a sonometer having 20 cm wire produces 5 beats per second. The beat frequency does not change if the length of the wire is changed to 21 cm. the frequency of the tuning fork must be

(1) 200 Hz (2) 210 Hz
(3) 205 Hz (4) 215 Hz

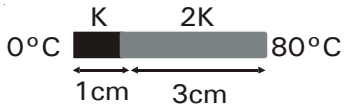
35. In a tug of war, team A of total mass m_1 is found to be winning over team B of total mass m_2. The coefficient of friction for team A and ground is μ_1 and that of team B and ground is μ_2. Then

(1) $\mu_1 m_1 > \mu_2 m_2$ (2) $\mu_1 m_1 = \mu_2 m_2$
(3) $\mu_1 m_1 < \mu_2 m_2$ (4) $\mu_1 m_2 > \mu_2 m_1$

PHYSICS : SECTION-B

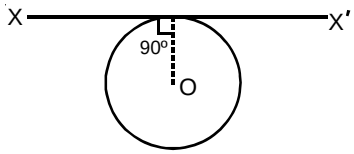
This section has 15 questions, attempt any 10 questions of them.

36. Two bars having equal cross-sectional area are joined length-wise as shown. In steady state, the temperature of the interface is



(1) 36°C (2) 32°C
(3) 24°C (4) 48°C

37. A thin wire of length L and uniform linear mass density ρ is bent into a circular loop with centre at O as shown. The moment of inertia of the loop about the axis XX' is



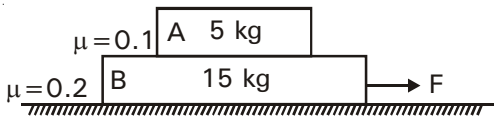
(1) $\frac{\rho L^3}{8\pi^2}$ (2) $\frac{\rho L^3}{16\pi^2}$
(3) $\frac{5\rho L^3}{16\pi^2}$ (4) $\frac{3\rho L^3}{8\pi^2}$

38. Consider the following two statements.
(A) If heat is added to a system, its temperature must increase
(B) If positive work is done by a system in a thermodynamics process, its volume must increase.
(1) both A and B are correct
(2) A is correct but B is wrong
(3) B is correct but A is wrong
(4) both A and B are wrong

39. A shell is fired at an angle of 37° to the horizontal direction with a velocity of 150 m/s. The time of flight of shell is
(1) 24 s (2) 18 s
(3) 21 s (4) 15 s

40. Two conservative force $\vec{F}_1$ and $\vec{F}_2$ act on an object.
What is the relation between W_1 and W_2, where
$W_1 = \oint(\vec{F}_1+\vec{F}_2)\cdot d\vec{s}$; $W_2 = \oint(\vec{F}_1-\vec{F}_2)\cdot d\vec{s}$
(1) $W_1 > W_2$ (2) $W_1 = W_2 \neq 0$
(3) $W_1 = W_2 = 0$ (4) $W_1 < W_2$

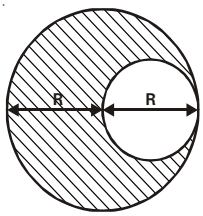
41. $4\frac{d^2y}{dt^2}+y=0$
The above equation represents an SHM with angular frequency
(1) 2 (2) 1/2
(3) 1/4 (4) 4

42. 

In the above figure, maximum applied force F for which two blocks move together is
(1) 80 N (2) 60 N
(3) 40 N (4) 20 N

43. A spherical source of power 4 W and frequency 800 Hz is emitting sound waves. The pressure amplitude sound waves at a distance 200 m is approximately (density of air is 1.23 kg/m^3 and speed of sound is 320 m/s)
(1) 0.06 Pa (2) 0.08 Pa
(3) 0.04 Pa (4) 0.05 Pa

44. 1 million particles, each weighing 5×10^{-5} gram, strike 1 cm^2 area per second with a speed 300 m/s in a normal direction and rebound with the same speed. Pressure on the surface is
(1) 3×10^5 Pa (2) 1.5×10^5 Pa
(3) 3×10^6 Pa (4) 1.5×10^6 Pa

45. A circular hole of diameter equal R has been cut out from a uniform circular disc of radius R as shown in figure. The centre of gravity of the remaining portion of the disc lies on the diameter of the disc at a distance x to the left of the centre of the original disc. The value of x is


(1) R (2) $\frac{R}{2}$
(3) $\frac{R}{4}$ (4) $\frac{R}{6}$

46. If the ratio of number of moles of hydrogen gas to oxygen gas is two, the ratio of total translational kinetic energy of hydrogen gas molecules to that of oxygen molecules at 20°C is
(1) 1 : 1 (2) 2 : 1
(3) 1 : 8 (4) 1 : 16

47. Which of the following is False ?
(1) Poisson's ratio is experimentally found to be positive for all materials.
(2) Pressure at the bottom of a tank containing a liquid does not depend on area of the bottom surface if height of liquid is kept same.
(3) The force needed to break a copper wire is doubled if its radius is doubled.
(4) A barometer kept in a stationary elevator reads 76 cm. If the elevator starts accelerating up the reading will be less than 76 cm.

48. The weight of an object in the coal mine, sea level, at the top of the mountain are W_1, W_2 and W_3 respectively, then
(1) $W_1 < W_2 > W_3$ (2) $W_1 = W_2 = W_3$
(3) $W_1 < W_2 < W_3$ (4) $W_1 > W_2 > W_3$

49. The speed of a car was 72 km/hr for the first 90 s and 36 km/hr for the next 5 km. Then the car decelerates uniformly at 0.25 m/s^2 till it comes to rest. The average speed of the car is
(1) $\frac{100}{9}$ m/s (2) $\frac{10}{3}$ m/s
(3) $\frac{40}{3}$ m/s (4) $\frac{80}{9}$ m/s

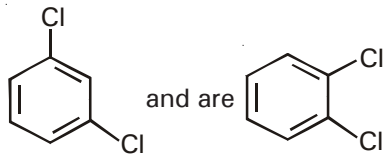
50. The surface tension of soap solution is 25×10^{-3} Nm^{-1}. The excess pressure inside a soap bubble of diameter 1 cm is
(1) 10 Pa (2) 20 Pa
(3) 5 Pa (4) 15 Pa

CHEMISTRY : SECTION-A

All questions are compulsory in section A

51. Which of the following has most acidic hydrogen?
(1) CH_3-NO_2 (2) CH_3CH_3
(3) $CH(NO_2)_3$ (4) $PhCH_3$

52. The reaction of $CH_2=CH-C\equiv C-H$ with 1 mole of H_2 gives
(1) $CH_2=CH-CH=CH_2$
(2) $CH_3-CH=CH-CH_3$
(3) $CH_3-CH_2-C\equiv C-H$
(4) $CH\equiv C-C\equiv C-H$

53.  and are
(1) Geometrical isomers
(2) Position isomers
(3) Functional Isomers
(4) Metamers

54. **Assertion** : Benzene reacts with iodinemonochloride in presence of anhydride $AlCl_3$ to form iodobenzene
Reason : Iodine monochloride reacts with anhyd. $AlCl_3$ to produce I^+ which attacks the benzene ring.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

55. The ionic bond between an element A (Z = 20) and the first halogen X is formed by transfer of _____ electrons from A.
(1) 1 (2) 2
(3) 3 (4) none of these

56. In which of the following species, all the bond lengths are equal?
(1) PCl_5 (2) $Cr_2O_7^{2-}$
(3) B_2H_6 (4) MnO_4^{2-}

57. Enthalpy of formation of HF and HCl are −161 kJ and −92 kJ respectively. Which of the following statement is incorrect?
(1) HCl is more stable than HF
(2) HF and HCl are exothermic compounds
(3) The affinity of fluorine to hydrogen is greater than the affinity of chlorine to hydrogen
(4) HF is more stable than HCl

58. The two equal bond dipoles point in opposite directions and cancel the effect of each other in
(1) H_2O (2) NF_3
(3) BF_3 (4) BeF_2

59. Combustion of 16 g of methane produces
(1) 1 mole of H_2O (2) 36 g of H_2O
(3) 16 g of water (4) 32 g of H_2O

60. When 4 litres of ammonia reacts with 1.5 litres of hydrogen chloride gas, volume of the mixture is
(1) 3.5 litres (2) 1 litre
(3) 1.5 litres (4) 2.5 litres

61. The electrons in the atom of P (atomic number 15) with $n + \ell = 3$ are
(1) 8 (2) 12
(3) 16 (4) 6

62. If the solubility product of MOH is 1×10^{-10} mol^2 dm^{-6}, then pH of its aqueous solution will be
(1) 12 (2) 9
(3) 6 (4) 3

63. 300 ml of a gas at 27°C is cooled to −3°C at constant pressure, the final volume is
(1) 540 ml (2) 135 ml
(3) 270 ml (4) 350 ml

64. The correct order of solubility of alkaline earth metal sulphate is
(1) $BeSO_4 > CaSO_4 > BaSO_4 > SrSO_4 > MgSO_4$
(2) $BeSO_4 > BaSO_4 > SrSO_4 > CaSO_4 > MgSO_4$
(3) $BeSO_4 > SrSO_4 > CaSO_4 > MgSO_4 > BaSO_4$
(4) $BeSO_4 > MgSO_4 > CaSO_4 > SrSO_4 > BaSO_4$

65. If n is the number of carbon atoms in potassium salt of a carboxylic acid, then the alkane formed on electrolysis of aqueous solution of this salt would have carbon atoms equal to
(1) n (2) n−1
(3) 2n−1 (4) 2(n−1)

66. Which of the following on the addition will cause intensity of deep red colour to increase?

$$\underset{\text{Pale yellow}}{Fe^{3+}(aq)} + \underset{\text{colourless}}{SCN^-} \rightleftharpoons \underset{\text{deep red}}{Fe(SCN)^{2+}(aq)}$$

I. $FeCl_3$ II. $HgCl_2$
III. $H_2C_2O_4$(oxalic acid) IV. KSCN
(1) I, IV (2) IV, III
(3) II, III (4) I, II, III

67. When zeolite (hydrated sodium aluminium silicate) is treated with hard water, the sodium ions are exchanged with
(1) H^+ ions (2) Ca^{+2} ions
(3) SO_4^{2-} ions (4) OH^- ions

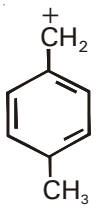
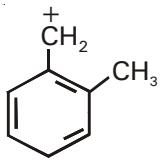
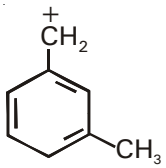
68. Vander waal's constants of two gases X and Y are as given

	a(L^2. atm. mol^{-2})	**b(L. mol^{-1})**
Gas X	5.6	0.065
Gas Y	5.1	0.012

What is correct about the two gases?
(1) Tc (X) > Tc(Y) (2) Tc (X) = Tc(Y)
(3) Vc(X) > Vc(Y) (4) Vc(Y) > Vc(X)

69. The correct oxidation state of I in KI is
(1) +1 (2) −1
(3) −1/3 (4) −4

70. Which of the following carbocation is most stable?

(1) 
(2) 
(3) 
(4) All are equally stable

71. The H—H bond energy is 430 kJ mol and Cl—Cl bond energy is 240 kJ/mol. ΔH_f for HCl is –90 kJ. The H—Cl bond energy is about
(1) 180 kJ/mol (2) 360 kJ/mol
(3) 213 kJ/mol (4) 425 kJ/mol

72. **Statement-I** : If probability density $|\psi|^2$ is constant on a given surface, $|\psi|$ is also constant over the surface.
Statement-II : Whenever an electron is described by a wave function, we say that the electron occupies that orbital.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

73. PbI_4 is not known. The correct reason(s) is/are
(1) I^- is a good reducing agent and reduces Pb^{4+} to Pb^{2+}
(2) energy released by the initially formed Pb–I bonds is insufficient to unpair the $6s^2$ electrons of Pb
(3) $6s^2$ electrons fail to unpair as they are stable due to poor screening effect of 4f electrons.
(4) all of these

74. Which of the following is perfectly represented thermochemical equation in which all the species are in these standard states?
(1) C(diamond) + O_2 (g) $\rightarrow$ CO_2 (s) + 393 kJ
(2) $H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O$ (g) $\Delta H = -245$ kJ
(3) $\frac{1}{2}N_2(g) + \frac{1}{2}O_2$ (g) $\rightarrow$ NO(g) $\Delta H = +180$kJ
(4) $N_2(g) + 3H_2(g) \rightarrow 2NH_3$ (l) $\Delta H = -93$ kJ

75. At room temperature, the eclipsed and staggered form of ethane cannot be isolated because
(1) both the conformers are equally stable
(2) they interconvert rapidly
(3) the energy difference between the conformers is large
(4) there is a large energy barrier of rotation about the sigma bond

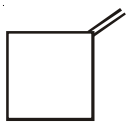
76. An element M reacts with chlorine to form a compound X. The bond angle in X is 120°. The M can be
(1) B (2) Mg
(3) N (4) Si

77. Match species with corresponding conjugate acid

	Species		**Conjugate acid**
i.	NH_3	a.	H_2CO_3
ii.	HCO_3^-	b.	NH_4^+
iii.	H_2O	c.	H_3O^+
iv.	HSO_4^-	d.	H_2SO_4

(1) i-b, ii-a, iii-c, iv-d (2) i-a, ii-d, iii-b, iv-c
(3) i-d, ii-b, iii-a, iv-c (4) i-c, ii-b, iii-d, iv-a

78. For the gaseous reaction at 300 K
$2A \rightleftharpoons B + C \quad \Delta_r G^o = 5744.14J$
The composition of the reaction mixture at a given time is [A] = 0.5, [B] = 2, [C] = 0.5. Then the reaction proceeds in the
(1) forward direction because $Q_C > K_C$
(2) backward direction because $Q_C > K_C$
(3) forward direction because $Q_C < K_C$
(4) backward direction because $Q_C < K_C$

79. Ozonolysis of an alkene produces only one dicarbonyl compound. The structure of alkene is
(1) $CH_3-CH=CH-CH_3$
(2) $CH_3-CH=CH-CH-CH_2$
(3) 
(4) 

80. B–H–B bridge in B_2H_6 is formed by the sharing of
(1) 2 electrons (2) 4 electrons
(3) 1 electron (4) 3 electrons

81. Among the following which has the highest first ionization energy?
(1) K (2) Na
(3) B (4) Ar

82. The correct order of stability is
(1) $O_2^{2+} > O_2^{+} > O_2 > O_2^{-} > O_2^{2-}$
(2) $O_2^{2-} > O_2^{-} > O_2 > O_2^{+} > O_2^{2+}$
(3) $O_2^{-} > O_2^{2-} > O_2 > O_2^{+} > O_2^{2+}$
(4) $O_2^{+} > O_2^{2+} > O_2 > O_2^{-} > O_2^{2-}$

83. Which of the following is true for degree of hydrolysis of a salt of strong acid and weak base?
a. Independent of dilution
b. Increases with dilution
c. Increases with decrease in K_b
d. Increases with increase in temperature
(1) a & b (2) b, c & d
(3) c & d (4) a, b & d

84. The chloride that can be extracted with pyridine is
(1) NaCl (2) KCl
(3) LiCl (4) RbCl

85. Now a days, tetra chloroethene ($Cl_2C=CCl_2$) solvent has been replaced by liquefied CO_2 for the dry-cleaning purposes. This is because
(1) of less time consumption
(2) liquid CO_2 will result in less harm to ground water
(3) liquid CO_2 is suspected carcinogen
(4) liquid CO_2 is a better solvent

CHEMISTRY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

86. Correct order of radius of 1st orbit of H, He^+, Li^{2+}, Be^{3+} is
(1) $Be^{3+} > Li^{2+} > He^+ > H$
(2) $He^+ > Be^{3+} > Li^{2+} > H$
(3) $H > He^+ > Li^{2+} > Be^{3+}$
(4) $He^+ > H > Li^{2+} > Be^{3+}$

87. Friedel-Crafts reaction of benzene with isobutyl chloride produces
(1) Isobutylbenzene (2) tert-Butylbenzene
(3) n-Butylbenzene (4) sec-Butylbenzene

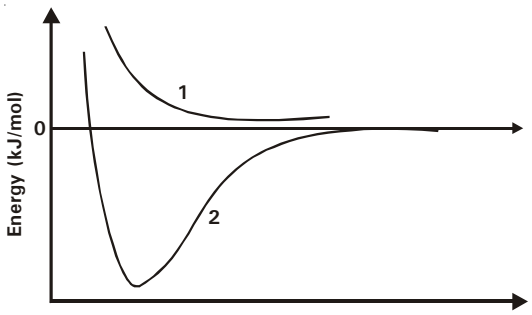
88. The pair of species having identical shape is
(1) CF_4 and SF_4 (2) XeF_2 & CO_2
(3) BF_3 and PCl_3 (4) PF_5 & IF_5

89. **Assertion** : $I_2 \rightarrow IO_3^{\ominus} + I^{\ominus}$ is a disproportionation reaction.
Reason : Oxidation state of I can vary from -1 to $+7$.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

90. Which of the following is not true about resonance?
(1) The resonating structures are hypothetical
(2) The unpaired electrons in various resonating structures are same
(3) Hybrid structure is most energetic
(4) Hybrid structure is least energetic

91. Identify the incorrect statement
(1) crude sodium chloride, generally obtained by crystallisation of brine solution, contains sodium sulphate, calcium sulphate, calcium chloride and magnesium chloride as impurities
(2) to obtain pure sodium chloride, the crude salt is dissolved in minimum amount of water and filtered to remove insoluble impurities
(3) sodium chloride melts at a very low temperature
(4) sodium chloride has a high solubility in water

92.



Consider the diagram above showing the possible levels of energy of H_2^+ ion depending on inter nuclear distance verses potential energy of the system and choose the correct statement
(1) curve 1 represent the most stable state of the system for H_2^+ ion
(2) curve 2 represent the most stable state of the system for H_2^+ ion
(3) curve 1 indicate that molecular hydrogen ion is formed
(4) curve 2 indicate that molecular hydrogen ion can not formed

93. Match Column I with Column II

	Column I		**Column II**
a.	16 gm of O_2	p.	1 gm atom of O
b.	Equivalent volume of H_2	q.	22.4 L at STP
c.	18 gm of $H_2O(\ell)$	r.	18 ml
d.	$\frac{1}{2}$ mole of $O_2 + \frac{1}{2}$ mole of Ne	s.	11.2 L at STP

(1) a– p, s; b–s; c–p, r; d–p, q
(2) a–s; b–p; c–r, q; d–p, q
(3) a–p; b–s; c–p; d–q, s
(4) a–q, p; b–r, s; c–p; d–p, s

94. On adding $AgNO_3$ to Lassaigne extract of organic compound black ppt. was obtained. What is the chemical composition of the black ppt.?
(1) AgCN (2) Ag_2S
(3) AgBr (4) AgF

95. Electronic configurations of four elements A, B, C and D are given below
A. $1s^2\ 2s^2\ 2p^6$ B. $1s^2\ 2s^2\ 2p^4$
C. $1s^2\ 2s^2\ 2p^6\ 3s^1$ D. $1s^2\ 2s^2\ 2p^5$
Which of the following is the correct order of increasing tendency to gain electron?
(1) A < C < B < D (2) A < B < C < D
(3) D < B < C < A (4) D < A < B < C

96. Which of the following equations depict the oxidising nature of H_2O_2?
(1) $2MnO_4^- + 6H^+ + 5H_2O_2 \rightarrow 2Mn^{2+} + 8H_2O + 5O_2$
(2) $2Fe^{3+} + 2H^+ + H_2O_2 \rightarrow 2Fe^{2+} + 2H_2O + O_2$
(3) $2I^- + 2H^+ + H_2O_2 \rightarrow I_2 + 2H_2O$
(4) $KIO_4 + H_2O_2 \rightarrow KIO_3 + H_2O + O_2$

97. Electron capacity of p-orbital is
(1) 2 (2) 6
(3) 10 (4) none

98. What is not correct about greenhouse effect?
(1) It results in global warming
(2) Carbon dioxide is one of main chemical species responsible for it
(3) It results in lowering of levels of ocean over the years
(4) CH_4,O_3, CFC also contribute to greenhouse effect

99. **Statement-I** : H_2S is a stronger acid than H_2O.
Statement-II : While comparing elements in the same group of the periodic table, H–A bond polarity becomes the deciding factor for determining acid strength.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

100. 4 mole of A are mixed with 4 mole of B when 2 mole of C are formed at equilibrium, according to reaction, $A + B \rightleftharpoons C + D$, equilibrium constant is
(1) $\sqrt{2}$ (2) 2
(3) 1 (4) 4

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. Joint between carpels is
(1) Hinge joint (2) saddle joint
(3) Gliding joint (4) Angular joint

102. Correct option for haepatic caecae associated with the gut of cockroach is
(1) lie in the foregut and helps in grinding of food
(2) 100-150 in number removing excretory wastes from haemolymph
(3) 6-8 in number opening at the junction of hindgut & midgut
(4) 6-8 blind tubules producing digestive enzymes

103. Which of the following regions of the brain is incorrectly paired with its function?
(1) Cerebellum-language comprehension
(2) Corpus callosum-communication between the left and right cerebral cortices
(3) Cerebrum-calculation and contemplation
(4) Medulla oblongata-homesotatic control

104. The homologous chromosomes separate, while sister chromatids remain associated at their centromeres during
(1) Anaphase (2) Telophase-II
(3) Anaphase-I (4) Anaphase-II

105. Terminalisation occurs during which stage of prophase-I?
(1) Leptotene (2) Zygotene
(3) Pachytene (4) Diakinesis

106. The  The above given reaction is catalysed by which class of enzymes?
(1) II (2) III
(3) V (4) IV

107. Which of the following is incorrect in relation to annelida?
(1) Closed circulatory system
(2) Nephridia help in osmoregulation and excretion
(3) Neural system has paired ganglia, lateral nerves and ventral double nerve cord
(4) Haemoglobin present in RBCs

108. Which of the following is not common to thyroid and thymus?
(1) Bilobed
(2) Endocrine nature
(3) Reduction in size with age
(4) Ventrally placed in body

109. Match entries in column-I with entries in column-II.

Column-I		**Column-II**	
a.	Goblet cells	i.	HCl
b.	Fat metabolism	ii.	Mucous
c.	Oxyntic cells	iii.	Lipases

(1) a-ii, b-iii, c-i (2) a-i, b-ii, c-iii
(3) a-ii, b-i, c-iii (4) a-iii, b-i, c-ii

110. Which of the following group of animals show sexual dimorphism?
(1) *Ascaris, Hirudinaria, Culex*
(2) *Periplanata, Pheretima, Taenia*
(3) *Hirudinaria, Wuchereria, Anopheles*
(4) *Ascaris, Ancylostoma, Periplanata*

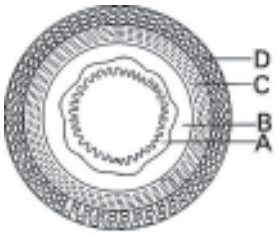
111. If a cell has 40 μg of DNA at G_2 phase, amount of DNA in a daughter cell at end of meiosis II will be
(1) 40 μg (2) 20 μg
(3) 10 μg (4) 5 μg

112. Amount of air left in lungs after powerful expiration is called
(1) Inspiratory volume
(2) Tidal volume
(3) Residual volume
(4) Expiratory reserve volume

113. Which among the following type of epithelium has limited role in secretion and absorption?
(1) Simple cuboidal epithelium
(2) Simple squamous epithelium
(3) Simple columnar epithelium
(4) Compound epithelium

114. Which of the following is correctly stated as it happens in the cockroach
(1) The food is ground by mandibles and gizzard
(2) Malpighian tubules are excretory structures projecting out from colon
(3) Oxygen is transported by respiratory pigment in blood
(4) Nitrogenous excretory waste is urea

115. Brunner's glands and crypts of lieberkuhn are present in _____ and _____ layers respectively in the given diagram of histology of gut



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

116. Phase between end of mitosis and beginning of DNA replication is
(1) G_0 (2) G_1
(3) G_2 (4) S

117. Non membrane organelle which help in cell division is
(1) centriole (2) ribosome
(3) nucleous (4) both (1) & (2)

118. Which of the following is similar in digestive system of *Pheritima* and *Periplanata*?
(1) Peristonium and labium
(2) Crop and gizzard
(3) Gizzard and intestine
(4) Typhlosole and intestinal caecae

119. Which of the following is an incorrect match w.r.t. neuron?
(1) Dendrites – Short fibres which branch repeatedly & project out of cell body
(2) Axon – Long process with branched distal end
(3) Nissl's granules – Present in cell body & Axon
(4) Dendrites – Transmit impulse towards cell body

120. How many of the following statements are correct for Aves?
a. Maintain constant body temperature.
b. Endoskeleton of birds is fully ossified.
c. Oil glands are present all over skin in birds.
d. Digestive tract has additional chambers crop and gizzard
(1) 1 (2) 2
(3) 3 (4) 4

121. Which is the correct decreasing order of partial pressure of oxygen in the inspired, alveolar and expired air ?
(1) Inspired air > expired air > alveolar air
(2) Inspired air > alveolar air > expired air
(3) Alveolar air > inspired air > expired air
(4) Expired air > alveolar air > inspired air

122. Which among the following is incorrect matching set?
(1) Leucocytes — 16000–18000 mm^{-3} of blood
(2) Haemoglobin — 12–16 gms / 100 ml of blood
(3) Erythrocytes — 5–5.5 million mm^{-3} of blood
(4) Platelets — 1,500,00–3,500,00mm^{-3} of blood

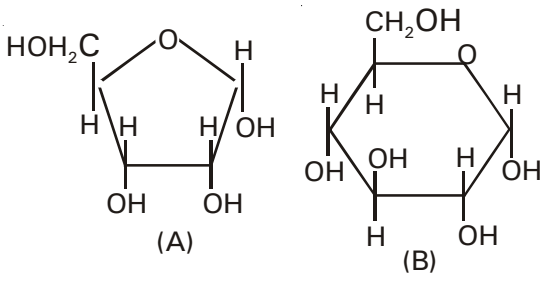
123. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because
(1) there is a positive intrapleural pressure
(2) there is a negative pressure in the lungs
(3) pressure in the lungs is higher than the atmospheric pressure
(4) there is negative intrapleural pressure pulling the lungs wall

124. Identify the incorrect match
(1) *Trygon* — poison sting
(2) *Torpedo* — electric organs
(3) *Scoliodon* — bony endoskeleton
(4) *Carcharodon* — ventral mouth

125. Erythroblastosis foetalis is seen in
(1) 1st pregnancy of Rh^+ mother with Rh^- foetus
(2) 1st pregnancy of Rh^- mother with Rh^- foetus
(3) 2nd pregnancy of Rh^- mother with Rh^+ foetus
(4) 2nd pregnancy of Rh^- mother with Rh^- foetus

126. **Statement-I** : Retinal is light absorbing part in all photopigments.
Statement-II : Photopigments are embedded in the outer segment of photoreceptor cells .
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

127. The given structures A and B are respectively of



(1) Deoxyribose, galactose
(2) Ribose, Glucose
(3) Deoxyribose, Fructose
(4) Ribose, Erythrose

128. 
Identify the organism and its phylum
(1) *Ascidia* – Urochordata
(2) *Amphioxus* – Cephlochordata
(3) *Balanoglossus* – Hemichordata
(4) *Neries* – Annelida

129. Most of Na^+ are reabsorbed actively in
(1) PCT (2) Loop of Henle
(3) DCT (4) Collecting duct

130. Which one of the following is incorrect match
(1) Toxic secondary metabolite — Ricin
(2) Polymer of Fructose — Inulin
(3) Protein which functions like intercellular ground substance — Collagen
(4) Nitrogen containing polysaccharide — Cellulose

131. **Assertion** : Cartilagenous fishes have to swim continuously to avoid sinking
Reason : Cartilagonous fishes do not have air bladder to regualte buoyancy.
(1) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(2) Assertion is true statement but Reason is false
(3) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(4) Assertion is false

132. Which of these can be seen in 'A' band of a myofibril?
a. Actin filaments b. Myosin filaments
c. M-line d. Z-line
e. H-zone
(1) a, b, c and d (2) a, b, c, and e
(3) b, c, d and e (4) a, b, d and e

133. The circulation which provides nutrients, oxygen and other essential substances to tissues is
(1) systemic circulation
(2) pulmonary circulation
(3) portal circulation
(4) hypophyseal circulation

134. How many of the following statements are correct?
a. All members of superclass pisces excrete NH_3
b. Mammals and terrestrial amphibians excrete urea
c. *Amphioxus* and *Planaria* excrete their waste via flame cells
d. Aquatic arthropods excrete ammonia
(1) one (2) two
(3) three (4) four

135. Find the incorrect statement

(1) Hypophysis is present in sella turcica of sphenoid bone

(2) Adenohypophysis consist of pars distalis and pars nervosa

(3) Pars intermedia is almost merged with pars distalis

(4) Oxytocin and vasopressin are synthesized by hypothalamus

ZOOLOGY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

136. If RV = 1200 mL
EC = 1600 mL
TV = 500 mL
What would be the value of FRC?

(1) 2800 mL (2) 1600 mL
(3) 2300 mL (4) 350 mL

137. Identify A, B and C in following reaction

a. Sucrose $\xrightarrow{A}$ glucose + fructose

b. Lactose $\xrightarrow{\text{lactase}}$ glucose + B

c. Maltose $\xrightarrow{\text{maltase}}$ glucose + C

(1) sucrase, glucose, galactose
(2) sucrase, galactose, glucose
(3) sucrase, fructose, glucose
(4) dextrinase, fructose, glucose

138. Match the abnormal conditions given in Column A with their explanations given in Column B and Choose the correct option

Column A	**Column B**
A. Glycosuria	i. Accumulation of uric acid in joints
B. Renal calculi	ii. Inflammation in glomeruli
C. Glomerular nephritis	iii. Mass of crystallised salts within the kidney
D. Gout	iv. Presence of glucose in urine

(1) A-i, B-iii, C-ii, D-iv (2) A-iii, B-ii, C-iv, D-i
(3) A-iv, B-iii, C-ii, D-i (4) A-iv, B-ii, C-iii, D-i

139. Which of the following allows passage of small amount of urea into medullary interstitium to keep up the osmolarity ?

(1) PCT (2) LOH
(3) DCT (4) CD

140. How many of the follwing statement(s) is/are correct?

a. Glucocorticoids stimulate gluconeogenesis, proteolysis, lipolysis

b. Cortisol is involved in maintaining cardiovascular system as well as kidney functions

c. ANF is a peptide hormone which increases blood pressure

d. Cortisol is anti inflammatory hormone

e. Pancreas contains two main types of cells in islets of langerhans

(1) three (2) four
(3) one (4) five

141. **Assertion** : With increase in substrate concentration, the velocity of enzymatic reactions rises at first, reaches a maximum velocity (v_{max}) which is not exceeded by any further rise in the concentration of substarate

Reason : Enzyme molecules are fewer than substrate molecules and after saturation of these molecules, there are no free enzyme molecules to bind with additional substrate molecules

(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion

(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion

(3) Assertion is true statement but Reason is false

(4) Assertion is false

142. Which of the following statements are correct?

a. *Obelia* shows metagenesis

b. Mesoglea is seen between mesoderm and endoderm

c. *Hydra* has cnidoblast on tentacles and body wall

d. Digestion is extracellular and intracellular in Ctenophora

(1) a & b (2) a, c & d
(3) a, b & c (4) all of these

143. **Statement-I** : Human small intestine is the longest portion of the alimentary canal.

Statement-II : Better absorption of nutrients requires a very large surface area.

(1) Both statement-I and statement-II are correct

(2) Both statement-I and statement-II are incorrect

(3) Statement-I is correct but statement-II is incorrect

(4) Statement-I is incorrect but statement-II is correct

144. Which of the following is correct statement?
(1) Forebrain consists of cerebrum, thalamus and hypothalamus
(2) Hypothalamus contains a number of centres which control body temperature, urge for eating and drinking
(3) inner parts of cerebral hemispheres and a group of associated deeep structures like amygdala, hippocamupus, form limbic system
(4) all of these

145. Which of the following option is incorrect w.r.t given reaction?

$CO_2 + H_2O \rightleftharpoons H_2CO_3$

(1) In the absence of enzymes 200 molecules of H_2CO_3 are formed per hour
(2) In the presence of carbonic anhydrase, 600,000 molecules of H_2CO_3 are formed per second
(3) Carbonic anhydrase increases reaction rate by about 10 billion times
(4) In the presence of carbonic anhydrase 36 million molecules of H_2CO_3 are formed per minute

146. Which of the following is an incorrect match?
(1) Bicephalic ribs– Each rib is having two articulating surfaces on dorsal side
(2) Sternum –Flat bone present on mid ventral side of thorax
(3) Axial skeleton –80 bones distributed along main axis of the body
(4) Atlas –1st cervical vertebra which articulates with second cervical vertebra by two occipital condyles

147. Spindle fibres are attached to chromosomes at
(1) centromere (2) kinetochore
(3) sister chromatids (4) metaphasic plate

148. What is not common to humans and frog?
(1) Notocord in embryonic stage
(2) Type of excretory waste
(3) Myogenic heart
(4) Nucleated RBCs

149. Hypothalamus is the principal intermediary between
(1) nervous system and muscles
(2) endocrine system and chromatophores
(3) nervous system and endocrine system
(4) nervous system and the respiratory system

150. Which of the following conditions cannot be seen in cretinism?
(1) Stunted growth (2) Abnormal skin
(3) Deaf-mutism (4) Normal intelligence

BOTANY : SECTION-A

All questions are compulsory in section A

151. If fat is being oxidized, then what will be respiratory quoitent of fat?
(1) >1 (2) <1
(3) $=1$ (4) 7

152. Ascomycetes differ from deuteromycetes in having
(1) branched and septate mycelium
(2) asexual spores
(3) ascocarp
(4) chitinous cell wall

153. *Cedrus* is
(1) spermatophyte
(2) homosporous
(3) dependent on air for pollination
(4) both (1) and (3)

154. Which of the following statement is incorrect?
(1) First word in a biological name represents genus
(2) Both the words in biological name when handwritten are underlined together
(3) When the names are printed in italics, they are not underlined
(4) The first word denoting the genus starts with capital letter

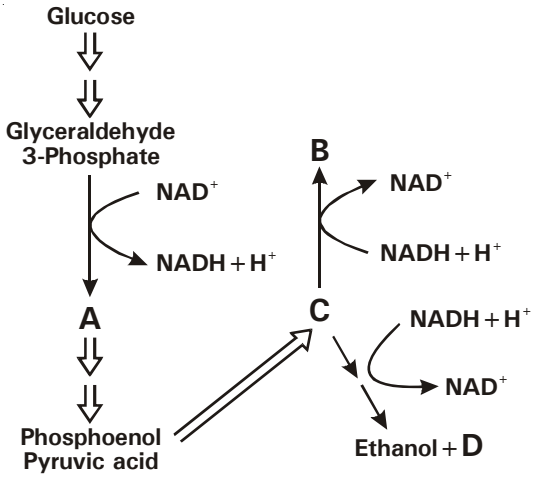
155. The process by which anything is grouped into convenient categories based on some easily observable character is
(1) systematics (2) taxonomy
(3) phylogeny (4) classification

156. The floral formula of the family solanaceae is
(1) $\% \, ♀ \, P_{(3+3)} \, A_{(3+3)} \, \underline{G_{(1)}}$
(2) $\oplus \, ♀ \, K_{(5)} \, \overset{\frown}{C_{(5)} \, A_5} \, \underline{G_{(2)}}$
(3) $Br \, ♀ \, P_{3+3} \, \overline{G_{(3)}}$
(4) $\oplus \, ♀ \, P_{3+3} \text{ or } _{(3+3)} \, \overline{G_{(3)}}$

157. Which of the following shows heterophylly due to change in environment?
(1) Larkspur (2) Cotton
(3) Coriander (4) Buttercup

158. **Statement- I** : Slime moulds are saprophytic protists.
Statement- II : Under favourable conditions, slime moulds form an aggregation called plasmodium which may grow and spread over several feet.
(1) Both statement -I and statement- II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement- II is correct

159. How many of the following plants show hypogynous condition?
Brinjal, Peach, Plum, Rose, Sunflower, China rose, Mustard, *Colchicum*
(1) three (2) four
(3) six (4) five

160.


In the major pathways of anaerobic respiration as shown above, the blanks labelled as A, B, C & D are respectively
(1) 3-phosphoglyceric acid, Pyruvic acid, Lactic acid, CO_2
(2) OAA acid, Pyruvic acid, Lactic acid, O_2
(3) OAA acid, Lactic acid, Pyruvic acid, O_2
(4) 3-phosphoglyceric acid, Lactic acid, Pyruvic acid, CO_2

161. In maize stem, vascular bundles are
(1) conjoint and open (2) conjoint & closed
(3) radial and closed (4) radial and open

162. Read the following statements
a. It maintains ribosome structure
b. It is structural component of chlorophyll
These statements are true for
(1) Mn (2) Mg
(3) Mo (4) P

163. In photorespiration
(1) CO_2 binds with RuBP
(2) synthesis of ATP takes place
(3) Oxidation of photosynthetic intermediate occurs
(4) C_4 plants lose 25%of fixed CO_2

164. Which of the following statement is incorrect?
(1) *Marchantia* is a thalloid liverwort showing, haplo-diplontic life cycle
(2) *Selaginella* is commonly called peat moss
(3) *Sphagnum* is used as packing material for trans-shipment due to its water holding capacity
(4) Specialised structures called gemma develop in gemma cups

165. 'Red tides' in coastal water developed due to super abundance of
(1) dinoflagellates (2) diatoms
(3) chrysophytes (4) euglenoids

166. Identify the incorrect match
(1) Joseph Priestley – Bell jar experiment
(2) Engelmann – first action spectrum
(3) Ruben et al – Role of air in growth of plant
(4) Van Niel – purple sulphur bacteria

167. Heartwood
a. possess tannins, resins, oils and gums
b. is hard, durable and resistant to the attack of microorganisms
c. is peripheral region of secondary xylem
d. conducts mineral and water
(1) a, b & c (2) a, b, c & d
(3) a & b (4) b, c & d

168. Match the type of sexual reproduction (w.r.t. fusion of the gametes in algae) in column I with its details in column II.

Column I	**Column II**
a. isogamous	p. one large non-motile female gamete and a smaller motile male gamete
b. anisogamous	q. dissimilar in size
c. oogamous	r. flagellated or non-flagellated but similar in size

(1) a-r, b-q, c-p (2) a-q, b-r, c-p
(3) a-p, b-r, c-q (4) a-r, b-p, c-q

169. _____involves the transfer of amino group form one amino acid to the keto group of the keto acid
(1) Reductive amination
(2) Oxidative decarboxylation
(3) Transamination
(4) Dehydrogenation

170. Hard stony endocarp and fibrous mesocarp is found in the fruit of
(1) Mango (2) Coconut
(3) Tomato (4) Maize

171. What is true about Methanogens?
(1) they are responsible for production of methane from cow dung
(2) they are eubacteria
(3) they live in salty areas
(4) both (2) and (3)

172. **Assertion** : C_3 plants when grown in green houses respond to higher CO_2 concentration and show increased rate of photosynthesis leading to higher productivity.
Reason : Present CO_2 concentration in atmosphere is limiting to C_3 plants.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

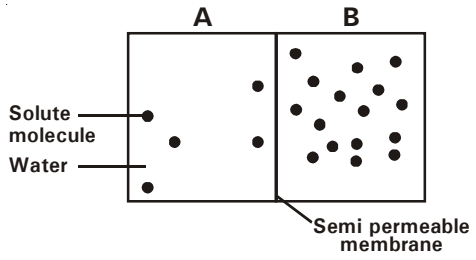
173. Krebs cycle does not involve
(1) reduction of NAD^+ (2) reduction of FAD
(3) release of CO_2 (4) utilization of O_2

174. How many of the following statements are correct?
a. Plasmid DNA is used to monitor bacterial transformation with foreign DNA
b. Cyanobacteria forms blooms in clean water
c. Mesosomes are membranous extensions into the cytoplasm that contain pigments
d. Cyanobacteria have chlorophyll 'a' similar to green plants
f. Pili are elongated tubular structures that help in locomotion
(1) 1 (2) 2
(3) 3 (4) 4

175. Response of plants to periods of day/night is termed
(1) Photoperiodism (2) Vernalisation
(3) Dormancy (4) Plasticity

176. i. spherical, oval or cylindrical cells
ii. highly thickened dead cells
iii. very narrow lumen.
Identify the type of cell on the basis of above information.
(1) Collenchyma (2) Sclereids
(3) Sclerenchyma fibres (4) Tracheids

177. Based on the figure given below which of the following statements is not correct?



(1) Movement of solvent molecules will take place from chamber A to B.
(2) Movement of solute will take place from A to B
(3) Presence of a semipermeable is a pre-requisite for this process to occur.
(4) The direction and rate of osmosis depends on both the pressure gradient and concentration gradient.

178. Development of zygote within female gametophyte that is retained on the parent sporophyte is an event which is a precursor to seed habit. It was first observed in
(1) *Sphagnum* (2) *Funaria*
(3) *Selaginellla* (4) *Spirogyra*

179. Which of the following is correct sequence as occuring in Z-scheme ?
a. Excitation of electrons of PS-II
b. Excitation of electrons of PS-I
c. Uphill transfer of electrons to acceptor
d. Downhill transfer of electrons to PS-I
e. Downhill transfer of electronss causing $NADP^+$ to reduce to $NADPH + H^+$
(1) a, c, d, b, c, e (2) d, c, b, c, a, e
(3) a, c, e, b, c, d (4) e, d, c, b, c, a

180. A lateral branch with short internodes and each node bearing a rosette of leaves and a tuft of roots is found in aquatic plants like
(1) *Chrysanthemum* (2) *Pistia*
(3) Jasmine (4) Banana

181. Which statement is true for Gibberellins ?
(1) They are widely used as herbicides
(2) They promote senescence
(3) They inhibit bolting and internode elongation
(4) They can be used to speed up malting process in brewing industry

182. How many of the following statements are correct w.r.t. viruses?
a. Viruses can pass through bacteria-proof filter
b. Viruses can be crystallised
c. Viruses are obligate parasites
d. All viruses contain both DNA & RNA
e. Viruses cannot kill the host
(1) 1 (2) 3
(3) 2 (4) 4

183. **Statement- I** : Facilitated diffusion cannot cause net transport of molecules from a low to a higher concentration.
Statement- II : Facilitated diffusion requires input of energy.
(1) Both statement -I and statement- II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement- II is correct

184. Read the following statements
a. Hypha is coenocytic
b. Commonly called as bread mould
c. Zygospore formation
These are true for which fungi?
(1) *Rhizopus* (2) *Albugo*
(3) *Gibberella* (4) *Fusarium*

185. Select the incorrect match
(1) Root cap - protection of root apex.
(2) Region of elongation - root growth in length
(3) Region of maturation - absorption of water and minerals
(4) Region of meristematic activity - rapid enlargement

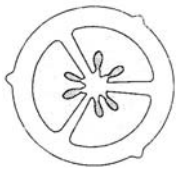
BOTANY : SECTION-B

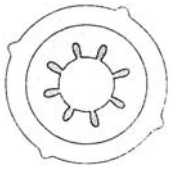
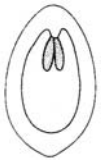
This section has 15 questions, attempt any 10 questions of them.

186. Which of the following protist member have pigments identical to higher plants?
(1) Slime mould (2) Dinoflagellate
(3) *Euglena* (4) Diatom

187. Endodermis is the region found in between
(1) cortex and pericycle
(2) pericycle and pith
(3) epidermis and cortex
(4) hypodermis and cortex

188. In the figures, which one is the characteristic placentation of *Asphodelous* (Liliaceae)?

(1)  (2) 

(3)  (4) 

189. Diplontic life cycle is seen in
(1) all seed bearing plants
(2) all pteridophytes
(3) some pteridophytes
(4) only in alga

190. **Statement-I** : Part of leaf inside flask, tests negative for presence of starch, in Moll's half leaf experiment.
Statement-II : Carbon dioxide present in the flask was absorbed by KOH.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

191. Number of reduced coenzymes produced when 2 molecules of acetyl coenzyme A are oxidized in Krebs cycle
(1) 4 (2) 8
(3) 2 (4) 3

192. In chloroplast, the membrane system is responsible for trapping (i) and also for synthesis of (ii) and (iii)
(1) i–solar radiation, ii–glucose, iii–ATP
(2) i–light energy, ii–NADPH, iii–glucose
(3) i–light energy, ii–ATP, iii–NADPH
(4) i–electrons, ii–ATP, iii–glucose

193. In nitrogen fixation
(1) plants convert atmospheric nitrogen into nitrates
(2) plants absorb ammonia from the soil
(3) the bacteria are all housed in nodules on the plant's stem
(4) the enzyme nitrogenase produces ammonia from gaseous nitrogen.

194. Match the entries in column I with entries in column II

	Column I		**Column II**
a.	Venus- fly trap	(i)	pinnate compound leaf
b.	Neem	(ii)	fleshy adventitious root
c.	Pumpkin	(iii)	stem tendrils
d.	Sweet potato	(iv)	modified leaves

(1) a–iv, b–ii, c–i, d–iii
(2) a–i, b–ii, c–iii, d–iv
(3) a–iv, b–i, c–iii, d–ii
(4) a–iii, b–iv, c–ii, d–i

195. Intercalary meristem is
(1) present at the shoot tips
(2) responsible for the formation of leaves
(3) capable of forming a branch
(4) used completely in formation of permanent tissue

196. How many statements are correct?
a. vacuolar sap, contribute to the solute potential of the cell
b. osmosis occurs spontaneously in response to a driving force
c. in plant cells, only cell membrane is the important determinant of movement of molecules in or out of the cell
d. numerically osmotic pressure is equivalent to the osmotic potential, but the sign is opposite
e. reverse osmosis is used in removing salt from saline water
(1) five (2) four
(3) two (4) one

197. What is true w.r.t. Herbarium?

(1) Collection of dead plant and animal specimens

(2) It gives actual account of habitat of flora and fauna of an area

(3) Collection of dried plant specimens

(4) Collection of living plant specimens

198. **Assertion** : Majority of bacteria are heterotrophic.

Reason : They depends on dead organic matter for food.

(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion

(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion

(3) Assertion is true statement but Reason is false

(4) Assertion is false

199. Which of the following is incorrect about EMP pathway?

(1) In aerobic organisms, it is the only process in respiration

(2) It is present in all living organisms

(3) Glucose undergoes partial oxidation to form two molecules of pyruvic acid

(4) Metabolism of glucose and fructose are same

200. Which of the following inhibitors are chemically identical?

(1) Inhibitor-A, Abscissin-II, dormin
(2) Inhibitor-B, Abscissin-II, dormin
(3) Inhibitor-A, Abscissin-I, dormin
(4) Ethylene-A, Abscissin-II, dormin