GMR Classes

GMR - NEET - REV TEST- 2

NOT PUBLISHED

Total Marks : 720.0
Duration : 3:00 hrs

Physics XI

1. Two rods A and B of identical dimensions are at temperature 30°C. If A is heated up to 180°C and B up to T°C, then the new lengths are the same. If the ratio of the coefficients of linear expansion of A and B is 4 : 3, then the value of T is

(A) 200°C

(B) 270°C

(C) 230°C

(D) 250°C

2. A body cools from $50^{\circ}C to 45^{\circ}C$ in 5 min and to $40^{\circ}C$ in another 8 min. The temperature of the surrounding is

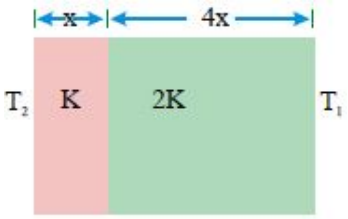
(A) $34^{\circ}C$

(B) $30^{\circ}C$

(C) $43^{\circ}C$

(D) $37^{\circ}C$

3. The temperature of the two outer surfaces of a composite slab, consists of two materials having coefficients of thermal conductivity K and 2K and thickness x and 4x respectively are T_2 and T_1 $(T_2 > T_1)$. The rate of heat transfer through slab, in a steady state is $\left[\frac{A(T_2 - T_1)K}{x}\right]f$, with f equals to



(A) 1

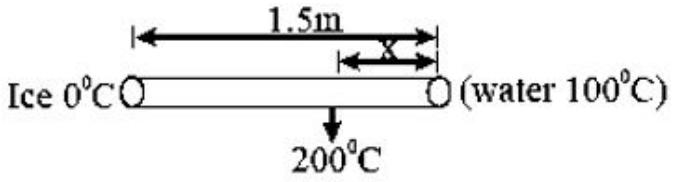
(B) 1/2

(C) 2/3

(D) 1/3

4.
One end of a copper rod of uniform cross section and of length 1.5m is kept in contact with ice and the other end with water at 100°C. At what point along its length should a temperature of 200°C be maintained so that in steady sate, the

mass of ice melting be equal to that of the steam produced in same interval of time? Assume that the whole system is insulated from surroundings. (L_{ice} = 80 cal/gm and L_{steam} = 540 cal/gm)



(A) 8.59 cm from ice end

(B) 10.34 cm from water end

(C) 10.34 cm from ice end

(D) 8.76 cm from water end

5. A body cools from 70 ° C to 60 ° C in 8 minute. The same body cools from 60 ° C to 50 ° C in

(A) 8 minutes

(B) L ess than 8 minute

(C) More than 8 minute

(D) 1 or 2 or 3 depending on the specific heat of the body

6. The specific heat of a substance at temperature t°C is $S = at^2 + bt + c$.

Calculate the amount of heat required to raise the temperature of m g of the substance from $0\,^{\circ}C$ to $t_0\,^{\circ}C$

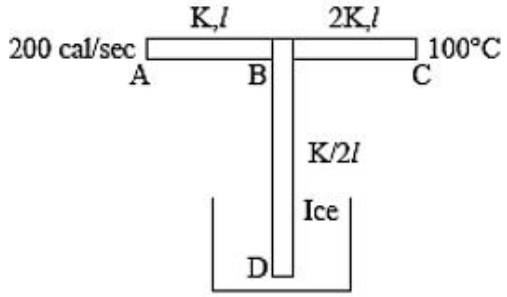
(A) $\frac{mt_0^3}{3} + \frac{mbt_0^2}{2} + mct_0$

(B) $\frac{mt_0^3 a}{3} + \frac{mbt_0^2}{2} + mct_0$

(C) $\frac{mt_0^3 a}{3} + \frac{mbt_0^2}{2}$

(D) $\frac{mt_0^3 a}{3} + \frac{mbt_0^2}{2} + \frac{ct_0}{2}$

7. Three rods AB, BC and BD of same length l and cross-sections area A are arranged as shown. The end D is immersed in ice whose mass is 440 gm. Heat is being supplied at constant rate of 200 cal/sec from the end. Time in which whole ice will melt (Latent heat of fusion of ice is 80 cal/gm)



(A) 40/3 min (B) 700 sec

(C) 20/3 min (D) I ndefinitely long time

8. A slab consists of two parallel layers of copper and brass of the same thickness and having thermal conductivities in the ratio 1:4. If the free face of brass is at 100 ° C and that of copper at 0°C, the temperature of interface is

(A) 80°C (B) 20°C

(C) 60°C (D) 40°C

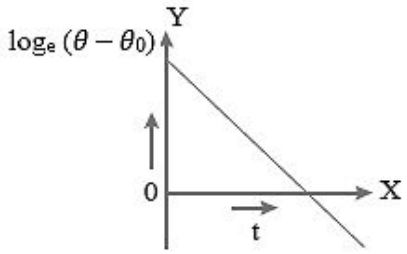
9. In a steady state of thermal conduction temperature of the ends A and B of 20 cm long rod are 100°C and 0°C respectively. The temperature of the rod at a point at a distance 6 cm. from the end A of the rod is

(A) 70°C (B) 30 $^{\circ}C$

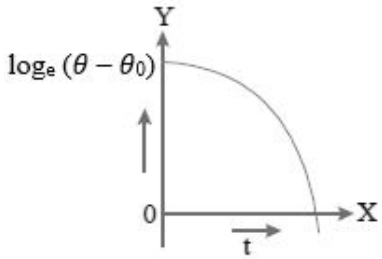
(C) 5 $^{\circ}C$ (D) 40 $^{\circ}C$

10. A liquid in a beaker has temperature θ (t) at time 't' and ' θ_0' is temperature of surroundings, then according to Newton's law of cooling the correct graph between $\log_e(\theta - \theta_0)$ and t is

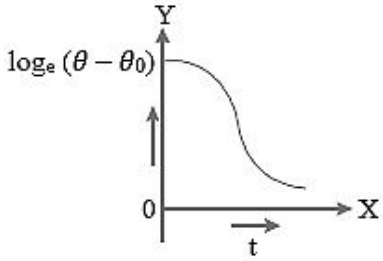
(A)



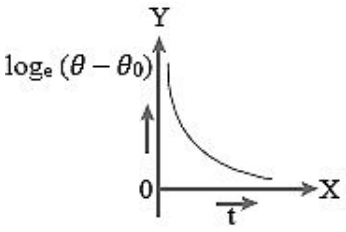
(B)



(C)



(D)



11. One end of metal bar of area of cross section 5cm^2 and 25cm in length is in steam other in contact with ice, the amount of ice melts in one minute is (L_{ice} = 80cal/gm, K=0.8cgs units)

(A) 16 gm (B) 12 gm

(C) 24 gm (D) 36 gm

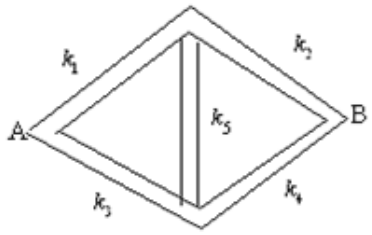
12. A sphere and cube of same material and same volume are heated up to the same temperature and allowed to cool in the same surroundings. The ratio of the amounts of radiations emitted will be

(A) 1:1 (B) $\frac{4\pi}{3}:1$

(C) $\left(\frac{\pi}{6}\right)^{1/3}:1$ (D) $\frac{1}{2}\left(\frac{4\pi}{3}\right)^{2/3}:1$

13. Five rods of the same dimensions are arranged as shown. They have thermal conductivities k_1, k_2, k_3, k_4. When

points A and B are maintained at different temperatures, no heat flows through the central rod. It follows that



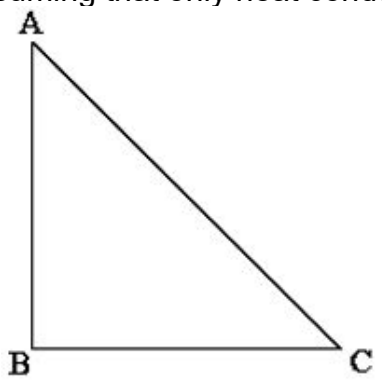
(A) $k_1 = k_4$ and $k_2 = k_3$ (B) $k_1 / k_4 = k_2 / k_3$

(C) $k_1 k_4 = k_2 k_3$ (D) $k_1 k_2 = k_2 k_4$

14. Three rods of identical cross-sectional area and made from the same metal form the sides of an isosceles triangle ABC right angled at B . The points A and B

are maintained at temperatures T and $\sqrt{2}T$, respectively, in the steady state.

Assuming that only heat conduction takes place, temperature of point C is



(A) $\frac{3T}{\sqrt{2}+1}$ (B) $\frac{T}{\sqrt{2}+1}$

(C) $\frac{T}{3(\sqrt{2}-1)}$ (D) $\frac{T}{\sqrt{2}-1}$

15. Three rods A, B and C have the same dimensions. Their conductivities are K_A, K_B and K_C respectively. A and B are placed end to end, with their free ends kept at certain temperature difference. C is placed separately with its ends kept at same temperature difference. The two arrangements conduct heat at the same rate Kc must be equal to

(A) $K_A + K_B$ (B) $\frac{K_A + K_B}{K_A K_B}$

(C) $\frac{1}{2}(K_A + K_B)$ (D) $\frac{K_A K_B}{K_A + K_B}$

16. Ice at –20°Cos added to 50 g of water at 40°C. When the temperature of the mixture reaches 0°C, it is found that 20 g of ice is still unmelted. The amount of ice added to the water was close to (Specific heat of water = 4.2J/g/°C Specific heat of Ice = 2.1 J/g/°C Heat of fusion of water at 0°C = 334 J/g)

(A) 50 g (B) 100 g

(C) 60 g (D) 40 g

17. A solid copper sphere of dimater 10mm, is cooled to a temperature of 150K and is then placed in an enclosure at 290 K. Assuming that all interchange of heat is by radiation, calculate the initial rate of rise of temperature of the sphere. The sphere may be treated as a black body

$\rho_{copper} = 8.93 \times 10^3 kg/m^3$, $s = 3.7 \times 10^2 JKg^{-2}K^{-1}$;

$\sigma = 5.7 \times 10^{-8} Wm^{-2}K^{-4}$

(A) 0.68 K/s (B) 0.068 K/s

(C) 0.34 K/s (D) 0.034 K/s

18. The wavelength corresponding to maximum intensity of radiation emitted by a source at temperature 2000 K is λ, then what is the wavelength corresponding to maximum intensity of radiation at temperature 3000 K?

(A) $\frac{2}{3}\lambda$ (B) $\frac{16}{81}\lambda$

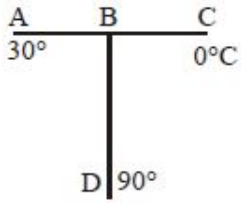
(C) $\frac{81}{16}\lambda$ (D) $\frac{4}{3}\lambda$

19. A black body is at 727°C. It emits energy at a rate which is proportional to

(A) $(1000)^4$ (B) $(1000)^2$

(C) $(727)^4$ (D) $(727)^2$

20. Three conducting rods of same material and cross section are shown in the figure. Temperatures of A, D and C are maintained at 30°C, 90°C and 0°C. The ratio of length of BD and BC if there is no heat flow in AB is



(A) 1/2 (B) 2/1

(C) 3/1 (D) 1/3

21. The radiation emitted by a star A is 10,000 times that of the Sun. If the surface temperature of the sun and the star A are 6000K and 2000k respectively, the ratio of the radii of the star A and the Sun is

(A) 300:1 (B) 600:1

(C) 900:1 (D) 1200:1

22. Two objects A & B have exactly the same shape and are radiating the same power. If their temperatures are in the ratio $\sqrt{3}:1$then the ratio of their emissivities is.

(A) 1:9 (B) 9:1

(C) 3:1 (D) 1:3

23. Two rods of length l and 2l thermal conductivities K_2 and 2K are connected end to end. If cross sectional areas of two rods are equal, then equivalent thermal conductivity of the system is

(A) (5/6) K (B) 1.5K

(C) 1.2 K (D) (8/9) K

24. A cylindrical rod with one end in a steam chamber and the other end is in ice. It is found that 1gm of ice melts per second. If the rod is replaced by another one of same material double the length and double area of cross section, the mass of ice that melts per second is

(A) 2 gm (B) 4 gm

(C) 1 gm (D) 0.5 gm

25. A calorimeter of water equivalent '5g' has water of mass 55 g up to a certain level. Another identical calorimeter has a liquid of mass '38g' up to same level. As both of them cool in the same surroundings from $50\,^{\circ}C\,to 46\,^{\circ}C$, water takes 80 s where as the liquid takes 32 s to cool. If the specific heat of water is cal/g – $^{\circ}C$, the specific heat of the liquid in cal/g – $^{\circ}C$ is

(A) 0.8 (B) 0.4

(C) 0.5 (D) 0.2

26. The temperature of a room, heated by a heater, is 20°C when outside temperature is –20°C and it is 10°C when the outside temperature is –40°C. The temperature of the heater is

(A) 80°C (B) 100°C

(C) 40°C (D) 60°C

27. Two metallic spheres S_1 and S_2 are made of the same material and have identical surface finish. The mass of S_1 is three times that of S_2. Both the spheres are heated to the same high temperature and placed in the same room having lower temperature but are thermally insulated from each other. The ratio of the initial rate of cooling of S_1 to that S_2 is:

(A) $\frac{1}{3}$ (B) $\left(\frac{1}{3}\right)^{\frac{1}{3}}$

(C) $\frac{1}{\sqrt{3}}$ (D) $\frac{\sqrt{3}}{1}$

28. The rate of cooling of a body depends upon

(A) Surface area of body (B) Mass of body

(C) Specific heat of material of body (D) All of these

29. The emissive power of a black body at T = 300K is $100 W/m^2$. Consider a body B of area A = $10 m^2$, coefficient of reflectivity r = 0.3, and absorptivity a = 0.2. If its temperature is 300K, then mark out the correct statement.

(A) The emissive power of B is $20 W/m^2$

(B) The emissive power of B is $200 W/m^2$ (C) The power emitted by B is 20W

(D) The power emitted by B is 180W

30. In a steady state of heat conduction the temperature of the ends A and B of a rod 100cm long are 0°C and 100°C. The temperature of the rod at a point 60cm distant from the end A is

(A) 0°C (B) 40°C

(C) 60°C (D) 100°C

31. The power radiated by a black body is P and it radiates maximum energy around the wavelength λ_0 . If the temperature of the black body is now changed so that it radiates maximum energy around a wavelength $3\lambda_0/4$, the power radiated by it will increase by a factor of

(A) 4/3 (B) 16/9

(C) 64/27 (D) 256/81

32. A black body at 127 ° C emits the energy at the rate of $10^6 J/m^2 s$. The temperature of a black body at which the rate of energy emission is $16 \times 10^6 J/m^2 s$ is

(A) 508 ° C (B) 273 ° C

(C) 400 ° C (D) 527 ° C

33. Two metal plates of same area and thickness l_1 and l_2 are arranged in series. If the thermal conductivities of the materials of the two plates are K_1 and K_2. The thermal conductivity of the combination is

(A) $\frac{2K_1K_2}{K_1 + K_2}$ (B) $\frac{K_1 + K_2}{2}$

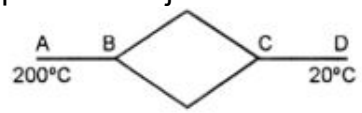
(C) $\frac{K_1K_2(l_1 + l_2)}{K_1l_2 + K_1l_1}$ (D) $K_1 + K_2$

34. If the absolute temperature of a black body is doubled the percentage increase in the rate of loss of heat by radiation is

(A) 15% (B) 16%

(C) 1600% (D) 1500%

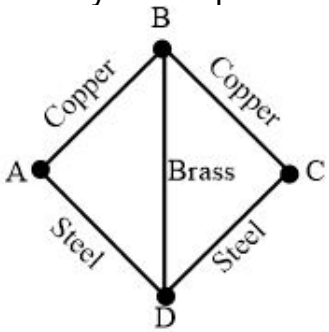
35. Six identical conducting rods are joined as shown in the figure. The ends A and D are maintained at 200°C and 20°C respectively. The temperature of junction C would be



(A) 80° C (B) 140° C

(C) 100° C (D) 120° C

36. Five wires each of cross–sectional area A and length *l* are combined as shown in figure. The thermal conductivity of copper and steel are K_1 and K_2 respectively. The equivalent thermal resistance between points A and C is



(A) $\frac{l}{(K_1 + K_2)A}$ (B) $\frac{2l}{(K_1 + K_2)A}$

(C) $\frac{l(K_1 + K_2)}{K_1K_2A}$ (D) None of these

37. A body cools from 80°C to 50°C in 5 minutes. The temperature of surroundings is 20°C. The time taken to cool from 60°C to 30°C will be

(A) 9 min (B) 7.5 min

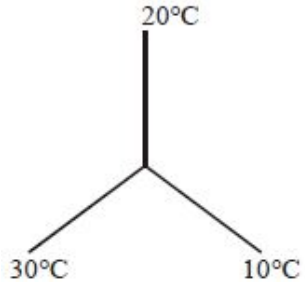
(C) 10 min (D) 12 min

38. The co-efficient of thermal conductivity of copper, mercury and glass respectively K_c, K_m and K_g such that $K_c > K_m > K_g$ if the same quantity of heat is flow per sec per unit area of each and corresponding temperature gradient are X_m, X_c and X_g :

(A) $X_c = X_m = X_g$ (B) $X_c > X_m > X_g$

(C) $X_c < X_m < X_g$ (D) $X_m < X_c < X_g$

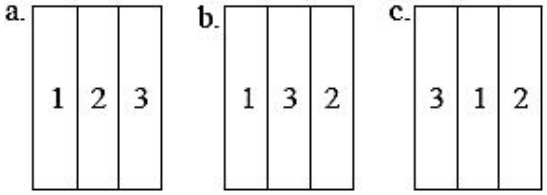
39. Three rods mode of the same material and geometrically identical are joined as shown. The temperature of the junction is



(A) 18.0°C (B) 10.0°C

(C) 14.0°C (D) 20°C

40. Three different arrangements of materials 1, 2 and 3 to from a wall. Thermal conductivities are $k_1 > k_2 > k_3$. The left side of the wall is 20°C higher than the right side. Temperature difference DT across the material 1 has following relation in three cases:



(A) $\Delta T_a > \Delta T_b > \Delta T_c$ (B) $\Delta T_a = \Delta T_b = \Delta T_c$

(C) $\Delta T_a = \Delta T_b > \Delta T_c$ (D) $\Delta T_a = \Delta T_b < \Delta T_c$

41. Two rod of different materials having coefficients of thermal expansion α_1 , α_2 and Young's modulus Y_1, Y_2 respectively are fixed between two rigid massive walls. The rods are heated such that they undergo the same increase in temperature. There is no bending of the rods. If $\alpha_1 : \alpha_2 = 2 : 3$, the thermal stressed developed in the two rods are equal provided $Y_1 : Y_2$ is equal to k : 2, the value of k being

(A) 1 (B) 5

(C) 3 (D) 9

42. A black body is at a temperature of 2880 K. The energy of radiation emitted by this object with wavelength between 499 nm and 500 nm is U_1, between 999 nm and 1000 nm is U_2 and between 1499 nm and 1500 nm is U_3. The Wein constant, b = 2.88 × 106 nm-K. Then

(A) $U_1 = 0$ (B) $U_3 = 0$

(C) $U_1 > U_2$ (D) $U_2 > U_1$

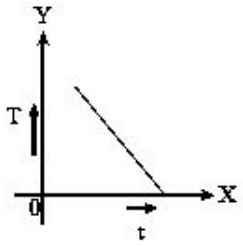
43. A and B are two points on a uniform metal ring whose centre is C. The angle ABC = θ . A and B are maintained at two different constant temperatures. When θ = 180°, the rate of total heat flow from A to B is 1.2 W. When θ = 90°, this rate will be

(A) 0.6 W (B) 0.9 W

(C) 1.6 W (D) 1.8 W

44. If a piece of metal is heated to temperature θ and then allowed to cool in room which is at temperature θ_0, the graph between the temperature T of the metal and time t will be closest to

(A)



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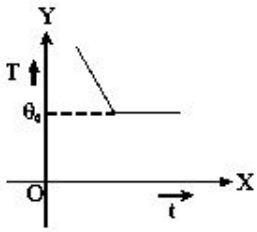

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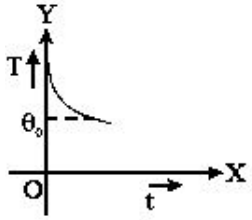

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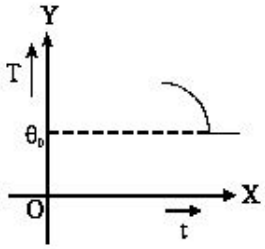


45. Two spheres of the same material have radii 1m and 4m and temperature 4000K and 2000K respectively. The energy radiated per second by the first sphere is:

(A) G reater than that of the second (B) L ess than that of the second

(C) E qual in both cases

(D) T he information is incomplete to draw any conclusion

Chemistry XI

46. The increasing order of acidic nature of Li_2O, BeO, B_2O_3, CuO is:

(A) $Li_2O < BeO < CuO < B_2O_3$ (B) $BeO < CuO < B_2O_3 < Li_2O$

(C) $Li_2O < CuO < BeO < B_2O_3$ (D) $B_2O_3 < CuO < BeO < Li_2O$

47. The central atoms in ClO3–, SF4 and XeF4 respectively undergo which of the following types of hybridisation?

(A) sp3, sp3d, sp3d2 (B) dsp3, sp3, sp3

(C) p2, sp3, dsp3 (D) p3, d2sp3, dsp2

48. Identify the correct order in which the ionic radius of the following ions increase

i) F^- ii) Na^+ iii) N^{3-}

(A) III, II, I (B) I, II, III

(C) II, III, I (D) II, I, III

49. Number of non-bonding electron pair on Xe in XeF_6, XeF_4 and XeF_2 respectively will be

(A) 6, 4, 2 (B) 1, 2, 3

(C) 3, 2, 1 (D) 0, 3, 2

50. The D.M. of KCl is 3.336×10^{-29} Coulomb-metre which indicates that it is highly polar molecule. The interatomic distance between K^+ and Cl^- in this molecule is 2.6×10^{-10} m. Calculate the dipole moment of KCl molecule if there were opposite charges of one fundamental unit located at each nucleus. Calculate the % ionic character of KCl.

(A) 60% (B) 50%

(C) 80% (D) 65%

51. General electronic configuration of the transition elements is given by

(A) ns^2nd^{1-10} (B) $ns^2np^6nd^{1-10}$

(C) $(n-1)d^{1-10}np^6$ (D) $(n-1)d^{1-10}ns^{0-2}$

52. Which of the following are arranged in an increasing order of their bond strength?

(A) $O_2^- < O_2 < O_2^+ < O_2^{2-}$ (B) $O_2^{2-} < O_2^- < O_2 < O_2^+$

(C) $O_2^- < O_2^{2-} < O_2 < O_2^+$ (D) $O_2^+ < O_2 < O_2^- < O_2^+$

53. The mode of hybridisation of central carbon in C_3O_2 is

(A) sp (B) sp^3

(C) sp^2 (D) sp^3d

54. The correct sequence of electron affinity of C, N, O and F is

(A) C > N < O < F (B) C > N < O > F

(C) C < N > O < F (D) C > N > O > F

55. For compounds,

A) Tetracyanoethene B) Carbon dioxide C) Benzene D) 1, 3-Butadiene
Ratio of s and p -bonds is in order

(A) A = B < C < D (B) A = B < D < C

(C) A = B = C = D (D) C < D < A < B

56.

In how many of the following species the central atom possess sp^3 hybridisation with pyramidal shape?

i) $XeOF_2$ ii) PO_4^{3-} iii) ClO_2^- iv) XeO_3 v) $N(CH_3)_3$

vi) XeF_2 vii) ClO_3^- viii) SO_3^{2-} ix) PF_3 x) XeO_2F_2

(A) 5 (B) 6

(C) 8 (D) 9

57. Which of the following species is non –linear?

(A) ICl_2^- (B) I_3^-

(C) XeF_2 (D) ClO_2^-

58. The order in which the following oxides are arranged according to decreasing basic nature is

(A) CuO, Na_2O, MgO, Al_2O_3 (B) Al_2O_3, MgO, CuO, Na_2O

(C) MgO, Al_2O_3, CuO, Na_2O (D) Na_2O, MgO, Al_2O_3, CuO

59. An atom A has 2K, 8L and 3M electrons. Another atom B has 2K and 6L electrons. The formula of the compound formed between A and B is

(A) AB (B) A_2B_3

(C) A_3B_2 (D) AB_2

60. Shape of xenon hexafluoride is -

(A) Tetrahedral (B) Distorted pentagonal bipyramidal

(C) Square planar (D) Octahedral

61. A diatomic molecule having a dipolement of 1.92 D and bond length of 2.0A°. Its percentage ionic character is

(A) 10%

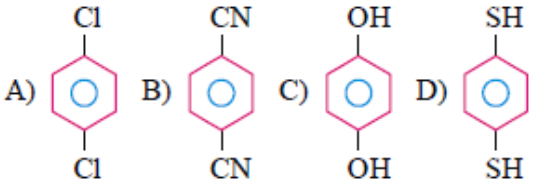
(B) 20%

(C) 15%

(D) 12.5%

62.

For which of the following molecule significant $\mu \neq 0$?



(A) A and B

(B) Only C

(C) C and D

(D) Only A

63. Two elements X and Y have following electronic configurations, $X=1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$ and $Y=1s^2 2s^2 2p^6 3s^2 3p^5$. The formula of the compound formed by the combination of X and Y is

(A) XY_2

(B) X_5Y_2

(C) X_2Y_5

(D) XY_5

64. Amongst H_2O, H_2S, H_2Se and H_2Te, the one with the highest Boiling point is

(A) H_2O; of H- bonding

(B) H_2Te; of higher molecular weight

(C) H_2S; of H- bonding

(D) H_2Se; of lower molecular weight

65. Number of lone pairs of electrons in 9 gms. of water are [N = Avogadro Number]

(A) 2N

(B) N/2

(C) N

(D) N/4

66. If the first I.P. and E.A. of silicon are 785.7 kj / mole & 135.0 kj / mole respectively, the electro negativity of Si is equal to

(A) $\left(\frac{785.7 + 135.0}{2}\right)$

(B) $0.208\sqrt{785.7 - 135.0}$

(C) $\left(\frac{787.5 + 135.0}{544}\right)$

(D) $\left(\frac{787.5 + 135.0}{4.18}\right)$

67. The successive I.P values for an element X are given below

$I.P_1$ = 410 KJ mol^{-1}; $I.P_2$ = 720 KJmol^{-1};

$I.P_3$ = 1100 KJ mol^{-1}; $I.P_4$ = 1500 KJ mol^{-1};

$I.P_5$ = 3600 KJ mol^{-1}.

Find out the number of valence electrons for the atom, X.

(A) 4 (B) 5

(C) 2 (D) 3

68. Standard heat of formation of KI is –78.31 kcal mol^{-1}. Calculate its lattice energy from following informations: I_1(K) = 4.3eV E_1 (I) = 73.4 kcal mol^{-1} Bond dissociation energy of I_2 is 36.1 kcal/mol, sublimation energy of K is 21.51 kcal mol.

(A) –143 kcal mol^{-1} (B) 143 kcal mol^{-1}

(C) 14.3 kcal mol^{-1} (D) –14.3 kcal mol^{-1}

69. The H-OH bond angle in water molecule is 105° . The H-OH bond distance being 0.94A° . The dipole moment for molecule is 1.85 debye. Calculate the charge on Oxygen atom. [cos 105° = 0.259(approx)]

(A) $\delta = 0.62\times10^{-10}$ esu (B) $\delta = 1.617\times10^{-10}$ esu

(C) $\delta = 4.8\times10^{-8}$ esu (D) $\delta = 2.45\times10^{-8}$ esu

70. Which of the following represents the correct order of increasing electron gain enthalpy with negative sign for the elements O, S, F and Cl ?

(A) Cl < F < O < S (B) O < S < F < Cl

(C) F < S < O < Cl (D) S < O < Cl < F

71. Number of bonding electron pairs and number of lone pairs of electrons in ClF_3, SF_4, BrF_5 respectively are

(A) 3, 2; 4, 2; 5, 2 (B) 3, 1; 4, 1; 5, 2

(C) 3, 1; 4, 2; 5, 1 (D) 3, 2; 4, 1; 5, 1

72. In which of the following bond order increases and magnetic behaviour changes from paramagnetic to diamagnetic.

(A) $O_2 \rightarrow O_2^+$ (B) $NO \rightarrow NO^+$

(C) $O_2 \rightarrow O_2^-$ (D) $N_2 \rightarrow N_2^+$

73. The correct sequence of ionic radii is

(A) $Cl^- > S^{2-} > Ar > Ca^{2+}$ (B) $S^{2-} > Cl^- > Ar > Ca^{2+}$

(C) $Ar > Cl^- > S^{2-} > Ca^{2+}$ (D) $Ca^{2+} > Ar > Cl^- > S^{2-}$

74. The first I.P of Li is eV and electron affinity of Cl is - 3.61 eV Calculate the ΔH in KJ mol $^{-1}$ for the reaction.
$Li_{(g)} + Cl_{(g)} \rightarrow Li^+_{(g)} + Cl^-_{(g)}$

(A) 173.5 Kj (B) 171 KJ/mol

(C) 173.8 Kj (D) 173.7 Kj

75. The values of electronegativity of atoms A and B are 1.20 and 4.0 respectively. The percentage of ionic character of A-B bond is

(A) 50% (B) 72.24%

(C) 55.3% (D) 43%

76. Which among the following have zero dipole moment?

(A) cis- $C_2H_2Cl_2$ (B) trans- $C_2H_2Cl_2$

(C) PCl_3 (D) 2-Pentene

77. From the elements: Cl, Br, O, F, Al, C, Li, Cs and Xe,The element with lowest ionization enthalpy

(A) Cs (B) O

(C) Li (D) Xe

78. The atomic numbers of elements of second transition series lie in the range of

(A) 57 to 70 (B) 38 to 47

(C) 39 to 48 (D) 40 to 49

79. Among the following, the molecule with the highest dipole moment is

(A) CH_3Cl (B) CH_2Cl_2

(C) $CHCl_3$ (D) CCl_4

80. In which of the following arrangements, the order is NOT according to the property indicated against it?

(A) $Al^{3+} < Mg^{2+} < Na^{+} < F^{-}$ - Increasing ionic size

(B) B < C < N < O - Increasing first ionization enthalpy

(C) I < Br < F < Cl - Increasing electron gain enthalpy with negative sign

(D) Li < Na < K < Rb - Increasing metallic radius

81. Group number of an element with atomic number 48 will be

(A) 10 (B) 11

(C) 12 (D) 6

82. Select correct order

(A) LiF < NaF < KF < RbF (Lattice energy)

(B) NaI > NaBr > NaCl > NaF (Ionic character)

(C) $K^+ < Ca^{2+} < Cd^{2+}$ (Polarising power) (D) $S^{2-} < O^2 < F^-$ (Polarizability)

83. Which of the following represent the correct sequence of basic nature of given oxides?

(A) $K_2O < Na_2O < Al_2O_3 < MgO$ (B) $Al_2O_3 < MgO < Na_2O < K_2O$

(C) $MgO < K_2O < Al_2O_3 < Na_2O$ (D) $Na_2O < K_2O < MgO < Al_2O_3$

84. The common features among the species CN^-, CO and NO^+ are

(A) bond order three and isoelectronic

(B) bond order three and weak field ligands

(C) bond order two and p-acceptors (D) isoelectronic and weak field ligands

85. The formal charges on the three oxygen atoms in O_3 molecules are

(A) 0, 0, 0 (B) 0, 0, -1

(C) 0, 0, +1 (D) 0, +1, -1

86. How many electrons are involved in bonding in Lewis structure of $C_2O_4^{2-}$ (oxalate) ion?

(A) 22 (B) 20

(C) 18 (D) 14

87. $AlCl_3$ is covalent but AlF_3 is ionic, this fact can be explained on the basis of

(A) Fajan's rules (B) Octet rule

(C) Electron affinity of halogen (D) Molecular orbital theory

88. The bond angle in H_2S molecule is 97°. If the S-H bond moment is 0.72 D, the deployment of H_2S is (cos 48.5°= 0.662)

(A) 0.95 D (B) 0.72 D

(C) 0.66 D (D) 0.36 D

89. Which pair of atomic numbers represents elements which are both s - block element

(A) 7, 15 (B) 6, 12

(C) 9, 17 (D) 3, 12

90. The position of an element with atomic number 16, in the periodic table is in ____ group and _____ period.

(A) VIA, II (B) IVA, II

(C) VIA, III (D) IVA, III

Botany XI

91. Which of the following statement is true for bryophyta -

(A) Along with water absorption roots also provide anchorment to plants

(B) Sporophyte is dominat

(C) Gametophyte is dominant and sporophyte is mostly parasitic

(D) Gametophyte is parasitic

92. Dinoflagellates have

(A)
A single flagellum in the transverse groove between the cell plates

(B)
A single flagellum in the longitudinal groove between the cell plates

(C)
Two flagella one lies longitudinally and the other transversely in a furrow between the wall plates

(D) No flagella

93. Which one of the following is a living fossil :-

(A) Spirogyra (B) Cycas

(C) Moss (D) Saccharomyces

94. Genus represents

(A) An individual plant or animal (B) A collection of plants or animals

(C) Group of closely related species of plants or animals

(D) None of these

95. Mesosome in a bacterial cell is

(A) Plasmid (B) Connection between two cells

(C) Plasma membrane infolded for respiration (D) None of these

96. Nutrition in Protists is

(A) Holophytic (B) Holozoic

(C) Saprozoic (D) All of these

97. The response to environmental stimuli is called

(A) Metabolism (B) Irritability

(C) Chemical reaction (D) Consciousness

98. Which one of the following pairs of plants are not seed producers : -

(A) Fern and Funaria (B) Funaria and Ficus

(C) Ficus and Chlamydomonas (D) Punica and Pinus

99. As we go from species to kingdom in a taxonomic hierarchy, the number of common characteristics

(A) Will decrease (B) Will increase

(C) Remain same (D) May increase or decrease

100. Which blue green algae imparts red colour to red sea

(A) Trichodesmium (B) Chlamydomonas nivalis

(C) Microcystis (D) Anabaena

101. In the light of recent classification of living organisms into three domains of life (bacteria, archaea and eukarya), which one of the following statement is true about archaea?

(A) Archaea completely differ from both prokaryotes and eukaryotes

(B) Archaea completely differ from prokaryotes

(C) Archaea resemble eukarya in all respects

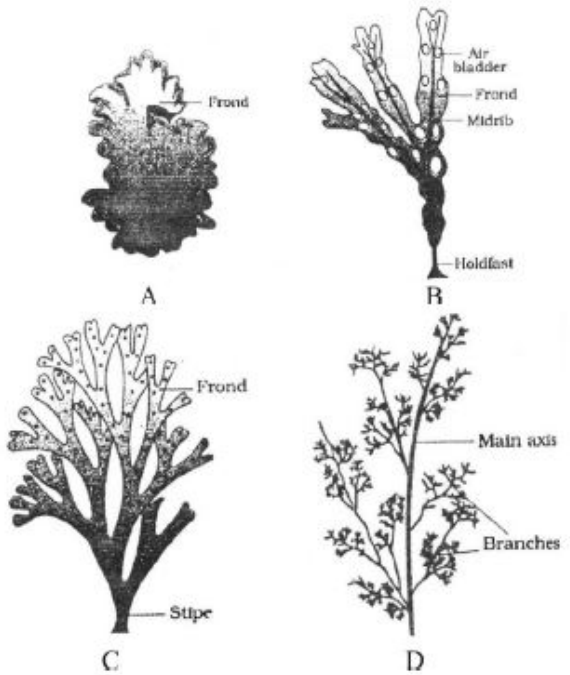
(D) Archaea have some novel feature that are absent in other prokaryotes and eukaryotes

102. Top-shaped multicilate male gamete and seeds with two cotyledons occur in

(A) Cycads (B) Conifers

(C) Polypetalous angiosperms (D) Gamopetalous angiosperms

103. Examine the figures A, B, C, D. In which one of the four options all the items A, B, C and D are correct?



(A) A-*Porphyra*, B-*Fucus*, C-*Dictyota*, D-*Polysiphonia*

(B) A-*Polysiphonia*, B-*Porphyra*, C-*Dictyota*, D-*Fucus*

(C) A-*Fucus*, B-*Dictyota*, C-*Porphyra*, D-*Polysiphonia*

(D) A-*Porphyra*, B-*Polysiphonia*, C-*Fucus*, D-*Dictyota*

104. Consider the following statements
I. Diatomite is porous and chemically inert. It is therefore, used in filtration of sugar, alcohols, oils, syrups and antibiotics
II. Diatoms posses cell walls in the form of 2 thin overlapping shells
III. Desmids are fire algae and are found in marine water Which of the statements given above are correct?

(A) I and II

(B) I and III

(C) II and III

(D) I, II and III

105. The statement 'nothing lives forever, yet life continues' illustrates the role of

(A) Embryogenesis

(B) Morphogenesis

(C) Replication

(D) Reproduction

106. Which of the following statements about Euglena is true?

(A) Euglenoids bear flagella

(B) Euglena when placed in continuous darkness, losses their photosynthetic activity and die

(C) The pigments of Euglena are quite different from those of green plants

(D) Euglena is a marine protist

107. Which one of the following organisms is scientifically correctly named, correctly printed according to the International rules of Nomenclature and correctly described?

(A) E. coli - Full name Entamoba coli, a commonly occurring bacterium in human intestine

(B) Musca domestica - The common house lizard, a reptile

(C) Plasmodium falciparum - A protozoan pathogen causing the most serious serious type of malaria

(D) Telis tigris - The Indian tigers, well protected in Gir forests.

108. In the below figure what are the labellings (a) and (b)?

(A) Cone and Root (B) Strobilus and Roots

(C) Strobilus and Rhizome (D) Dwarf shoot and base of stem

109. Which one of the following is common to multicellular fungi, filamentous algae and protonema of mosses?

(A) Members of kingdom plantae (B) Mode of nutrition

(C) Multiplication by fragmentation (D) Diplontic life cycle

110. Compared with the gametophytes of the bryophytes, the gametophytes of vascular plants tend to be

(A) Smaller but to have larger sex organs

(B) Larger but to have smaller sex organs

(C) Larger and to have larger sex organs

(D) Smaller and to have smaller sex organs

111. An edible rhodophyte is

(A) Polysiphonia (B) Batrachospermum

(C) Porphyra (D) Corallina

112. In the life cycle of Neurospora, after karyogamy in ascus, the diploid nucleus contains 14 chromosomes. The diploid nucleus undergoes meiosis, followed by mitosis in each of the daughter nuclei, producing a total of eight ascospores. If diploid nucleus in ascus at G_2 phase, contains 400 picograms of DNA, then a single ascospore nucleus of this species should contain how much DNA (Pg), carried on how many chromosomes ?

(A) 100, 7 (B) 100, 14

(C) 200, 7 (D) 400, 14

113. Which one of the following is wrongly matched ?

(A) Nostoc – Water blooms (B) Spirogyra – Motile gametes

(C) Sargassum – Chlorophyll C (D) Basidiomycetes – Puffballs

114. Which one of the following is a vascular cryptogam?

(A) Marchantia (B) Cedrus

(C) Equisetum (D) Ginkgo

115. The basidiocarp bearing saprophytic fungi are

(A) Agaricus, Puccinia (B) Albugo, Mucor

(C) Aspergillus, Neurospora (D) Amanita, Ganoderma

116. The major function of contractile vacuole is

(A) Excretion (B) Circulation

(C) Osmoregulation (D) All the above

117. Viruses are

(A) Non cellular organisms that are characterised by having a reactive crystalline structure

(B) Causes diseases like mumps, typhoid and influenza

(C) have only single stranded RNA as genetic material

(D) are inert outside their specific host cell

118. Viruses did not find a place in classification since

(A) They are not truly living (B) They are obligate parasite

(C) They are cellular (D) They are hyperparasite

119. Oxygenic photosynthesis occurs in

(A) Rhodospirillum (B) Chlorobium

(C) Chromatium (D) Oscillatoria

120. The plant group that produces spores and embryo but lacks vascular tissues and seeds is

(A) Pteridophyta (B) Rhodophyta

(C) Bryophyta (D) Phaeophyta

121. Which pair is incorrect?

(A) Rhizobium – Free living and symbiotic

(B) Frankia – Free living and symbiotic

(C) Rhodospirillum – Anaerobic, N2 fixing (D) Bacillus – Anaerobic, N2 fixing

122.
The taxonomical aid which is an index of plant species in an area is

(A) Grade (B) Manuals

(C) Monographs (D) Flora

123. Which taxonomical aid provides all information about a particular taxon like order or family?

(A) Herbarium (B) Catalogue

(C) Taxonomic key (D) Monograph

124. Identify the correct statement

(A) Ascocarps are formed in Ascomycetes

(B) Toad stools are edible mushrooms (C) Albugo causes white rust on wheat

(D) Basidiospores are zoospores

125. Most obvious and technically complicated feature of all living organisms is

(A) Reproduction (B) Self conciousness

(C) Ability to sense their surroundings (D) Metabolism

126. Unique feature of Bryophytes is

(A) Independent gametophyte (B) Independent sporophyte

(C) Diplontic life cycle

(D) Sporophyte is physically and physiologically dependent on gametophyte.

127. Incorrect regarding viroids is

(A) Can multiply (B) Contain ribonucleotides

(C) Cause diseases in plants (D) Ribonucleotides are covered by capsid

128.
Sphagnum is used as a packing material for transporting of living materials because of its

(A) Acidic nature as it does not undergo decay

(B) Creeping capacity (C) Water holding capacity

(D) Both (1) & (3)

129. Choose the wrong pair

(A) Hepaticopsida – Marchantia (B) Lycopsida – Selaginella

(C) Bryopsida – Anthoceros (D) Pteropsida – Dryopteris

130. In gymnosperms, the pollen chamber represents

(A) a cell in the pollen grain in which the sperms are formed

(B) a cavity in the ovule in which pollen grains are stored after pollination

(C) an opening in the megagametophyte through which the pollen tube approaches the egg.

(D) the microsprorangium in which pollen grains develop

131. Endosperm in pinus is –

(A) Haploid (B) Diploid

(C) Triploid (D) Polyploid

132. The famous botanical garden “Kew’ is located in

(A) England (B) Lucknow

(C) Kolkata (D) Australia

133. Which combination of characteristics is correct for a fern sporangium -

(A) Sessile, Unicellular, non-jacketed (B) Stalked, unicellular, non jacketed

(C) Sessile, multicellular, non jacketed (D) Stalked, multicellular, jacketed

134. Maximum photosynthesis takes place by -

(A) Phytoplankton (B) Zooplankton

(C) Marsh plants (D) Woody plants

135.
Water is not necessary for sexual reproduction or act of fertilization in

(A) Ulothrix (B) Funaria

(C) Dryopteris (D) Cycas

136. Congential diseases are -

(A) Diseases present at birth (B) Deficiency diseases

(C) Spread from one individual to another (D) Occur during life

137. Toxin produced by tetanus affects -

(A) Voluntary Muscles (B) Involuntary Muscles

(C) Both voluntary & involuntary muscles (D) Jaw bones

138. Agents is used to kill microbes on living surfaces are called -

(A) Disinfectant (B) Tranquilizers

(C) Antiseptic (D) (1) & (3) are correct

139. An excessive elargement of a disease organ due to an increase in the number of cells in called -

(A) Athrophy (B) Hyperplasia

(C) Necrosis (D) Angina

140. The bacterial disease cholera is accompanied by :

(A) Peptic ulcers (B) Rapid loss of fluid from the intestine

(C) Infection of heart muscles (D) Rose spots

141. Which of the following is not correctly matched -

(A) Dengue fever - Arbovirus (B) Plague - Yersinia pestis

(C) Syphlis - trichuris trichura (D) Sleeping Sickness - Trypanosoma

142. In which one of the following pairs of diseases both are caused by viruses ?

(A) Tetanus and typhoid (B) Whooping cough and sleeping sickness

(C) Syphilis and AIDS (D) Measles and Rabies

143. An auto-immune disease is

(A) SCID (B) rheumatoid arthritis

(C) myasthenia gravis (D) both (b) and (c)

144. Take the odd one out

(A) Rabies, Influenza, AIDS (B) Amoebiasis, Giardiasis, Trypanosomiasis

(C) Taeniasis, Ascariasis, Elephantiasis (D) Cancer, Tuberculosis, Tetanus

145. Cancer detection is based on
(1) Biopsy
(2) Histopathological studies of tissues
(3) Blood test
(4) Bone marrow test

(A) 1, 2 (B) 1, 3 and 4

(C) 1, 2 and 3 (D) 1, 2, 3 and 4

146.

Study the following lists

List-I	**List-II**
A. *Pasteurella pestis*	I. Angular leaf spot of cotton
B. *Treponema*	II. Amphotericin
C. *Mycobacterium bovis*	III. Actinomycosis of cattle
D. *Streptomyces*	IV. Syphilis
	V. Plague

The correct match is

(A) A-IV, B-I, C-II, D-III (B) A-II, B-III, C-IV, D-V

(C) A-V, B-IV, C-III, D-II (D) A-III, B-II, C-I, D-IV

147. Plague is caused by :

(A) Diplococcus pneumonia (B) Yersina pestis

(C) Corneybacterium diphtherias (D) all of the above

148. ELISA is used to detect viruses, where –

(A) Southern blotting is done (B) Alkaline phosphatase is the key reagent

(C) Catalase is the key reagent (D) DNA-probes are required

149. Which of the following disease is spread by mosquito but not caused by virus -

(A) Dengue fever (B) Yellow fever

(C) Filariasis (D) Chicken pox

150. Mumps is viral diseases that causes inflammation of -

(A) Parotid glands (B) Sublingual glands

(C) Submaxillary gland (D) Inra orbital gland

151. Chiken pox is caused by-

(A) Varicella virus (B) Adeno virus

(C) Bacteriophase T_2 (D) S.V. 40 virus

152. Thalassemia is due to -

(A) Increased consumption of sea food

(B) Decreased synthesis of b-polypeptide chain of Haemoglobin

(C) Decreased production of R.B.C. that cause anemia

(D) All the above

153. Emphysema is due to intake of

(A) Narcotics (B) Heroin

(C) Smoking (D) Opiates

154. In India AIDS was reported in

(A) 1932 (B) 1986

(C) 1990 (D) 1992

155. Widal test is performed for

(A) Malaria fever (B) Cholera

(C) Typhoid fever (D) Dengue fever

156. HIV has a protein coat and a genetic material which is

(A) ss-RNA (B) ds-RNA

(C) ds-DNA (D) ss-DNA

157. Which is not cancer?

(A) Leukaemia (B) Trachoma

(C) Carcinoma (D) Sarcoma

158. Diphtheria is caused by

(A) Viruses (B) Eukaryotes

(C) Mycoplasma (D) Bacteria

159. Salmonella is related with

(A) Typhoid (B) Polio

(C) T.B (D) Tetanus

160. HIV infects

(A) RBC (B) T- Helper cells

(C) B – cells (D) Basophils

161. Typhoid is caused by

(A) Rickettsia (B) Chlamydia

(C) Salmonella typhi (D) Mycobacterium

162. Arthritis is a disease of the inflammations of

(A) Joint (B) Blood vessel

(C) Brain (D) Intestine

163. Street virus affects

(A) Kidney (B) C.N.S

(C) Lungs (D) Eyes

164. The disease, Tetanus also knows as

(A) Gangrene (B) Shingles

(C) Lockjaw (D) Whooping cough

165. Sickle cell anermia has not been eliminated from the African population because :

(A) it provides immunity against malaria (B) it is controlled by dominant genes

(C) it is controlled by recessive genes (D) it is not a fatal disease

166. Chicken pox is caused by

(A) Varicella virus (B) Adeno virus

(C) Bacteriophage T2 (D) S.V. 40 Virus

167. Sickle cell anaemia is due to :

(A) Change of Amino Acid in a-chain of Haemoglobin

(B) Change of Amino Acid in b-chain of Haemoglobin

(C) Change of Amino Acid in a and b chain of Haemoglobin

(D) Change of Amino Acid either a or b chain of Haemoglobin

168. Which of the following is a pair of viral diseases?

(A) Typhoid, Tuberculosis (B) Ringworm, AIDS

(C) Common cold, AIDS (D) Dysentery , Common cold

169. Chancroid is a sexually transmitted disease caused by

(A) *Treponema* (B) *Haemophilus*

(C) *Neisseria* (D) *Chlamydia*

170. Infection of *Ascaris* usually occurs by

(A) Imperfectly cooked pork (B) Tsetse fly

(C) Mosquito bite (D) Contaminated water and vegetables

171. Which of the following is an air-borne disease

(A) A.I.D.S (B) Asthma

(C) Jacob syndrome (D) Thalassemia

172. Which of the following is the most infectious disease

(A) Hepatitis – B (B) AIDS

(C) Allergic cough and cold (D) Malaria

173. In Polio the legs get paralysed and atrophied due to

(A) Obstruction of muscles (B) Degeneration of bones

(C) Death of some muscles (D) Shrinkage of muscles

174. Mumps is viral diseases that causes inflammation of

(A) Parotid gland (B) Sublingual glands

(C) Submaxillary gland (D) Infra orbital gland

175. Plasmodium enters the human body as

(A) Female anopheles mosquito (B) Sporozoites

(C) Trophozoite (D) Haemozoin

176. Health is affected by

(A) Genetic disorders – deficiencies (B) Infections

(C) Life style (D) All of these

177. Pathogenic stages of Entamoeba hystolytica are formed in

(A) Small intestine (B) Large intestine

(C) Liver (D) Spleen

178. The maximum viable period of embryonated eggs of Ascaris under favourable conditions is

(A) 20 years (B) 30 years

(C) 12 years (D) 6 years

179. Stool of a person contain whitish grey colour due to malfunction of which type of organ

(A) Pancreas (B) Spleen

(C) Kidney (D) Liver

180. Which of the following is correctly matched

(A) Anopheles – Malaria (B) House fly – Yellow fever

(C) Body louse – Typhoid (D) Sand fly – Plague

GMR Classes

GMR - NEET - REV TEST- 2

NOT PUBLISHED

Total Marks : 720.0
Duration : 3:00 hrs

KEY

1. (C)	**2.** (A)	**3.** (D)
4. (B)	**5.** (C)	**6.** (A)
7. (A)	**8.** (A)	**9.** (A)
10. (A)	**11.** (B)	**12.** (C)
13. (C)	**14.** (A)	**15.** (D)
16. (D)	**17.** (B)	**18.** (A)
19. (A)	**20.** (B)	**21.** (C)
22. (A)	**23.** (C)	**24.** (C)
25. (C)	**26.** (D)	**27.** (B)
28. (D)	**29.** (A)	**30.** (C)
31. (D)	**32.** (D)	**33.** (C)
34. (D)	**35.** (A)	**36.** (B)
37. (A)	**38.** (C)	**39.** (D)
40. (B)	**41.** (C)	**42.** (D)
43. (C)	**44.** (C)	**45.** (C)
46. (C)	**47.** (A)	**48.** (D)
49. (B)	**50.** (C)	**51.** (D)
52. (B)	**53.** (A)	**54.** (A)
55. (A)	**56.** (A)	**57.** (D)
58. (D)	**59.** (B)	**60.** (B)
61. (B)	**62.** (C)	**63.** (A)
64. (A)	**65.** (C)	**66.** (C)
67. (A)	**68.** (A)	**69.** (B)

70. (B) **71.** (D) **72.** (B)

73. (B) **74.** (B) **75.** (B)

76. (B) **77.** (A) **78.** (C)

79. (A) **80.** (B) **81.** (C)

82. (C) **83.** (B) **84.** (A)

85. (D) **86.** (D) **87.** (A)

88. (A) **89.** (D) **90.** (C)

91. (C) **92.** (C) **93.** (B)

94. (C) **95.** (C) **96.** (D)

97. (B) **98.** (A) **99.** (A)

100. (B) **101.** (D) **102.** (A)

103. (A) **104.** (A) **105.** (D)

106. (A) **107.** (C) **108.** (C)

109. (C) **110.** (D) **111.** (C)

112. (A) **113.** (B) **114.** (C)

115. (D) **116.** (C) **117.** (D)

118. (A) **119.** (D) **120.** (C)

121. (D) **122.** (D) **123.** (D)

124. (A) **125.** (C) **126.** (D)

127. (D) **128.** (D) **129.** (C)

130. (B) **131.** (A) **132.** (A)

133. (D) **134.** (A) **135.** (D)

136. (A) **137.** (A) **138.** (C)

139. (B) **140.** (B) **141.** (C)

142. (D) **143.** (D) **144.** (D)

145. (D) **146.** (C) **147.** (B)

148. (B) **149.** (C) **150.** (A)

151. (A) **152.** (B) **153.** (A)

154. (B) **155.** (C) **156.** (A)

157. (B) **158.** (D) **159.** (A)

160. (B) **161.** (C) **162.** (A)

163. (B) **164.** (C) **165.** (A)

166. (A) **167.** (B) **168.** (C)

169. (B) **170.** (B) **171.** (B)

172. (A) **173.** (C) **174.** (A)

175. (B) **176.** (D) **177.** (B)

178. (D) **179.** (D) **180.** (A)

SOLUTIONS

1. Changing in length in both roads are same

$\Delta\ell = \alpha\ell\Delta\theta$

$\therefore\ \alpha_1\ell_1\Delta\theta_1 = \alpha_2\ell_2\Delta\theta_2$

$4 \times (180 - 30) = (T - 30) \times 3$

$600 = (T - 30) \times 3$

$T = 230°C$

2. $\frac{d\theta}{dt} = K\left(\frac{\theta_1 + \theta_2}{2} - \theta_0\right)$

3. $R_{eq} = \frac{x}{KA} + \frac{4x}{2KA} = \frac{3x}{KA}$

$\frac{Q}{t} = \frac{(T_2 - T_1)}{R_{eq}} = \frac{(T_2 - T_1)KA}{3x}$

Compare this equation with given equation.

4.

$$m_{ice} = \frac{KA(200-0)t}{80(1.5-x)};$$

$$m_{steam} = \frac{KA(200-100)t}{540\times x}$$

According to given problem, $m_{ice} = m_{steam}$

5. Rate of cooling decreases with fall of temperature. Hence, time increases.

6.

$$Q = \int msdT$$
$$= m\int_0^{t_0}(at^2+bt+c)\,dt$$
$$\therefore Q = m\left[\frac{at_0^3}{3}+\frac{bt_0^2}{2}+ct_0\right]$$

7.

Give k (thermal conductivity)
=100 cal/m/sec/^{0}C, A=10 cm^2, l=1m
If θ be temperature of B,

then $\frac{2kA(\theta-100)}{l}+\frac{(k/2)A(\theta-0)}{l}=200$

Substituting value

$$\theta = 880^0 C \therefore \phi_1 = mL; \frac{kA(880-0)}{2l}\times t = 440\times 80$$

$$t = \frac{80\times 1\times 2\times 440}{100\times 10\times 10^{-4}\times 880} = 800\text{sec} = 40/3\,\text{min}$$

8.

Let θ be temperature of interface

$$\left(\frac{Q}{t}\right)_{\text{Brass}} = \left(\frac{Q}{t}\right)_{\text{Cu}}; \frac{4KA(100-\theta)}{x} = \frac{KA(\theta-0)}{x}$$

10.

$$\frac{d\theta}{dt} = -k(\theta-\theta_0) \quad ; \int_{\theta_0}^{\theta}\frac{d\theta}{\theta-\theta_0} = -k\int_0^t dt$$

$\ln(\theta-\theta_0) = -kt + C$ so graph is a straight line.

11. $Q = mL = \dfrac{KA(\theta_1 - \theta_2)t}{l}$

12. Given $(\text{Volume})_{\text{sphere}} = (\text{Volume})_{\text{cube}}$

$$\frac{4}{3}\pi R^3 = a^3 \Rightarrow \frac{R}{a} = \left(\frac{3}{4\pi}\right)^{1/3}$$

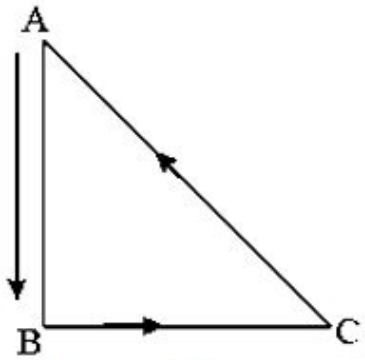
Here, R, a are radius of this sphere and side of the cube

$$P = e\sigma A(T^4 - T_S^4) \Rightarrow \frac{P_1}{P_2} = \frac{A_1}{A_2} = \frac{4\pi R^2}{6a^2}$$

13. This is analogous to a balanced Wheatstone bridge

$R_1 = \dfrac{l}{k_1 A}$ etc. and $R_1R_4 = R_2R_3$ for balance

14.



$$\left(\frac{Q}{t}\right)_{BC} = \left(\frac{Q}{t}\right)_{CA}$$

$$\frac{KA\left(\sqrt{2}T - T_c\right)}{l} = \frac{KA\left(T_c - T\right)}{\sqrt{2}l}$$

15.

When A and B are in series

$$\frac{l_1+l_2}{K_{eff}}=\frac{l_1}{K_1}+\frac{l_2}{K_2}\Rightarrow K_{eff}=\frac{2K_AK_B}{K_A+K_B}$$

$$\frac{Q}{t}=\frac{\left(\frac{2K_AK_B}{K_A+K_B}\right)A(\Delta\theta)}{2l} \quad \text{..... (i)}$$

For rod C $\frac{Q}{t}=\frac{K_CA(\Delta\theta)}{l}$ ..... (ii)

From (i) and (ii) we get value of K_C

16. Let m mass ice added to water

$m \times (2.1) \times 20 + (m - 20) \times 334 = 50 \times 4.2 \times 40$

$42m + 334m - 6680 = 210 \times 40 = 8400$

$m = 40.1$

17.

Using Stefan's law, the rate of increase of temperature is $\frac{dT}{dt}=\frac{\sigma}{\rho}\frac{A}{V}\frac{(T_0^4-T^4)}{s}$

Where $\rho = 8.93 \times 10^3 \text{kg/m}^3$,

s = 3.7×10^2J/kg/K A/V = area/volume ratio

$\frac{A}{V}=\frac{6}{d}$; d = diameter of the sphere

T_0 = temperature of the surrounding = 290K

T= temperature of the body = 150K

$\therefore \frac{dT}{dt}=\frac{6\sigma}{\rho sd}(T_0^4-T^4)=0.068Ks^{-1}$

21. $P = \sigma(4\pi R^2)T^4 \Rightarrow \frac{R_A}{R_{sun}} = \frac{\sqrt{P_A}}{P_{sun}} \times \left(\frac{T_{sun}}{T_A}\right)^2$

22. $P = e\sigma AT^4 \Rightarrow \frac{e_1}{e_2} = \left(\frac{T_2}{T_1}\right)^4$

23.

In series, $R_{eff} = R_1 + R_2 \left(R = \frac{\ell}{KA} \right)$

$$\frac{\ell_1 + \ell_2}{K_{eff}} = \frac{\ell_1}{k_1} + \frac{\ell_2}{k_2}$$

24. $Q = mL = \frac{KA(\theta_1 - \theta_2)t}{l} \Rightarrow \frac{m_2}{m_1} = \frac{A_2}{A_1} \times \frac{l_1}{l_2}$

25.

From Newton's law of cooling $\frac{d\theta}{dt} \propto \frac{1}{ms} \Rightarrow t \propto ms$

$\therefore \frac{W + m_1 s_1}{W + m_2 s_2} = \frac{t_1}{t_2}$; W = thermal capacity of calorimeter.

27.

$$ms\frac{dq}{dt} = es A\left(T^4 - T_0^4\right)$$

$$\frac{4}{3}pr^3 s\frac{dq}{dt} = es\,4pr^2\left(T^4 - T_0^4\right); \frac{dq}{dt} a \frac{1}{r} a \frac{1}{m^{1/3}}$$

29.

For body A, emissivity = absorptivity = 0.2

So, from Kirchhoff's law, $\frac{E}{a}\Big|_{\text{black body}} = \frac{E}{a}\Big|_{B}$

$\Rightarrow \frac{100}{1} = \frac{E}{0.2} \Rightarrow E = 20 W/m^2$

30. $Q = \frac{KA(\Delta\theta)t}{l} \Rightarrow \frac{\theta_1 - \theta_2}{L} = \frac{\theta - \theta_2}{l}$

31. $P = \sigma A T^4$ and $\lambda_m T$ = const $\frac{P_2}{P_1} = \left(\frac{T_2}{T_1}\right)^4$

32. $E = \sigma T^4 \Rightarrow \frac{E_1}{E_2} = \left(\frac{T_1}{T_2}\right)^4$

33. $R_{eff} = R_1 + R_2 \left(R = \frac{l}{KA}\right); \frac{l_1 + l_2}{K_{eff}} = \frac{l_1}{k_1} + \frac{l_2}{k_2}$

34. $P = \sigma A T^4 \Rightarrow \frac{P_2 - P_1}{P_1} \times 100 = \left[\left(\frac{T_2}{T_1}\right)^4 - 1\right] \times 100$

35.

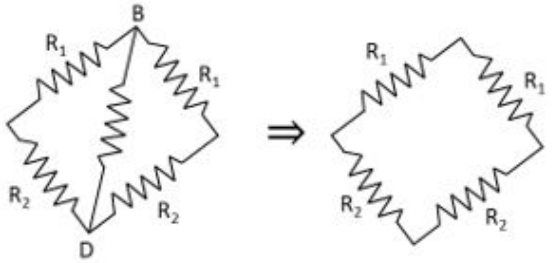
$\frac{200-20}{3} = 60$

$T_B = 200 - 60 = 140$

$T_C = 140 - 60 = 80$

36.

Here $R_1 = \frac{l}{K_1 A}, R_2 = \frac{l}{K_2 A}$



By the concept of wheat stone bridge, the temp. of B & D are same

$R = \frac{2R_1R_2}{R_1+R_2} = \frac{2l}{A(K_1+K_2)}$

38.

$Q = \frac{KA(\Delta\theta)t}{l} \Rightarrow K\left(\frac{\Delta\theta}{l}\right) = \text{const}$

$\left(\frac{\Delta\theta}{l}\right) \propto \frac{1}{K} \Rightarrow X \propto \frac{1}{K}$; Since, $K_c > K_m > K_g$

∴ For same quantity of heat flow per sec per unit area of each $X_c < X_m < X_g$

39. 30 - θ = θ - 20 + θ - 10

30 - θ = 2θ - 30

∴ θ = 20°C

40. Since the rate of heat flow will be same in all the three cases so the temperature difference will also be same across wall I because it has same parameters in all the cases.

42.

According to Wien's displacement law,

$\lambda_m T =$ Wien's constant (b)

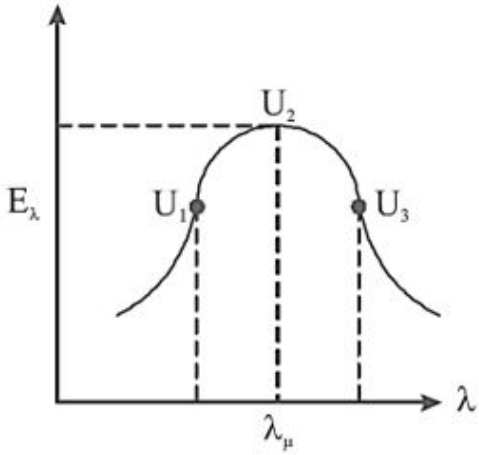
or $\lambda_m T = \frac{b}{T} = \frac{2.88 \times 10^6 \text{mm K}}{2880 \text{ K}}$ or λ_m=1000nm

∴ Energy of radiation is maximum at

λ_m = 1000nm

∴ Thus $U_2 > U_1, U_2 > U_3, U_1 \neq 0, U_2 \neq 0$

∴ Option (D) is correct



43.

R = Total thermal resistance of the ring

ΔT = difference in temperature between A and B

For $\theta = 180°$ equivalent resistance between A and B is R/4 (R/2 & R/2 in parallel)

Rate of flow of heat $I_1 = 1.2 = \frac{\Delta T}{R/4} \therefore \frac{\Delta T}{R} = 0.3$

For $\theta = 90°$ equivalent resistance between A and B is 3R/16 (R/4 & 3R/4 in parallel)

Rate of flow of heat $I_2 = \frac{\Delta T}{3R/16} = \frac{16}{3} \times 0.3 = 1.6\text{W}$

44.

$$\frac{d\theta}{dt} = -k(\theta - \theta_0) \; ; \; \int \frac{d\theta}{\theta - \theta_0} = -K \int dt$$

$$\log(\theta - \theta_0) = -Kt + C \Rightarrow \theta - \theta_0 = e^{-Kt+C}$$

$$\theta = \theta_0 + e^{-Kt+C}$$

45. $P = \sigma A T^4 = \sigma 4\pi r^2 T^4 \Rightarrow \frac{P_1}{P_2} = \left(\frac{r_1}{r_2}\right)^2 \times \left(\frac{T_1}{T_2}\right)^4$

46. On moving left to right hi periodic table, acidic nature of oxide increases. So, metallic oxides are basic, non-metallic oxides are acidic and BeO is amphoteric.

48. $r_{N^{-3}} > r_{F^-} > r_{Na^+}$

So increasing order of radii ii > I > III

50. Dipole moment of Kcl is 3.336×10^{-29} coloumb – metre = 10D

The inter atomic distance between $K^{+} and\ Cl^{-}$ is $2.6 \times 10^{-10} m$

Theoretical dipole moment of $Kcl = 2.6 \times 10^{-10} \times 4.8 \times 10^{-18}$

$= 12.48D$

% of ionic character of Kcl $= \frac{10}{12.48} \times 100 = 80\%$

51.

52. (Bond strength α bond order)

$O_2^{\oplus} > O_2 > O_2^{\ominus} \rightarrow O_2^{2-}$

↓ ↓ ↓ ↓

2.5 2 1.5 1] bond order

53. Conceptual

54. The correct sequence of electron affinity of C, N, O and F is

C> N < O <F. This order is according to electronegativity. But in case of N which has half-filled p-orbitals which are more stable N has lesser electron affinity than C.

55. Conceptual

56.

i) $XeOF_2 \rightarrow Sp^3d$ hybridisation.

$ii)\ PO_4^{3-} \rightarrow Sp^3$ hybridisation; no lone pair, tetrahedral

$iii)\ ClO_2^{-} \rightarrow Sp^3$ hybridisation; v shape

$iv)\ XeO_3 \rightarrow SP^3$ hybridisation pyramidal, 1 lone pair

$v)\ N(CH_3)_3 \rightarrow$

sp^3 hybridisation; 1 lone pair, 3 bone pairs, pyramidal

$vi)\ XeF_2 \rightarrow Sp^3d$ hybridisation, linear.

$vii)\ ClO_3^{-} \rightarrow$

sp^3 hybridisation, 3 bone pair, 1 lone pair, pyramidal

$viii)\ SO_3^2 \rightarrow Sp^3$, 3 bond pair, 1 lone pair, pyramidal.

$ix)\ PF_3 \rightarrow Sp^3$, 3 bond pair, 1 lone pair, pyramidal

$x)\ XeO_2F_2 \rightarrow$

sp^3d hybridisation, see - saw structure.

∴5

57. ICl_2^- – linear

I_3^- – linear

N_3^- – linear

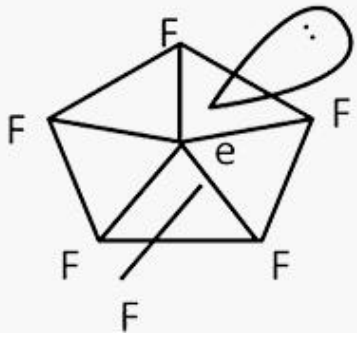
ClO_2^- – angular due to sp^3 hybridisation of Cl atom

58.
Basic nature of oxides depends on the metallic nature of the element. Hence the correct decreasing order of basic nature of oxides is $Na_2O > MgO > Al_2O_3 > CuO$.

59. Conceptual

60.
XeF_6 (shape of Xenon hexafluoride is)

$8 + 6 = \frac{14}{2} = 7$



Disterted Pentagonal bipyramidal

61.
dipole moment $\mu = e \times d$

$1c.b = 3 \times 10^9\ e.so$ $\mu = 2 \times 10^{-8} \times 4.8 \times 10^{-10} e.so \times cm$

$1\ Debye = 10^{-18}\ e.s.o \times em$ $\mu = 9.6 \times 10^{-18}\ e.s.o \times cm$

$\mu = 9.6\ Debye$

$\%\ ionic\ character = \frac{\mu given}{\mu calculate} \times 100$

$= \frac{1.92}{9.6} \times 1000$

$=20\%$

62. A and B are planar C and D are non planar.

63. Conceptual

64. B.P→ hydrogen bonding > molecular weight

65. Conceptual

66. $Electro\ negativity of Si = \frac{I.P + E.P}{544}(in\ Kj)$

$= \frac{787.5 + 135.0}{544}$

67.
The successive I.P values for an element 'X' are given between
$IP_1 = 410KJ\ mole^{-1}, IP_2 720KJ\ mole^{-1}, IP_3 = 1100KJ\ mole^{-1},$
$IP_4 = 1500KJ\ mole^{-1}, IP_5 = 3600KJ\ mole^{-1}$. Here there is a long jump in the values in between IP_4 and IP_5. Hence after removal of four electrons, the element 'X' acquires inert gas configuration. Hence the number of valence electrons for the atom 'X' are 4.

68.

$$S + I + \frac{D}{2} + EA + LE = \Delta H$$

$$21.51 + 3.4(23.06) + \frac{36.1}{2} - 73.4 + L.E = -78.31.$$

$\therefore$ Lattice energy $\approx$ - 143.49 K cal / mole

69.

$$= \sqrt{\mu_{OH}^2 + \mu_{OH}^2 + 2\mu_{OH}^2 \cos 105^0}$$

$$1.85 = \sqrt{2\mu_{OH}^2[1 + \cos 105^0]}$$

$$\mu_{OH} = 1.52 \text{ debye} = 1.52 \times 10^{-18} \text{esucm}$$

$\mu_{OH} = \delta \times d$ δ is the partial charge

$1.52 \times 10^{-18} = \delta \times 0.94 \times 10^{-8} \Rightarrow$
$\delta = 1.617 \times 10^{-10}$ esu

70. Ammonia has greater dipole moment than Nitrogen triflouride because in ammonia the orbital dipole due to lone pair of electrons is in the same direction as resultant dipolemoment of 3 N-H bonds.where as in nitrogen triflouride it is in opposite direction.

72.

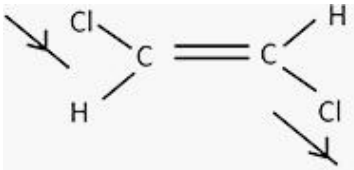
(1) $O_2 \rightarrow O_2^+$ (2) $NO \rightarrow NO^+$ (3) $O_2 \rightarrow O_2^-$ (4) $N_2 \rightarrow N_2^+$

2	2.5	2.5	3	2	1.5	3	2.5
para	para	para	dia				

73.
For isoelectronic species higher is the magnitude of negative charge (or) atomic charge, higher will be the ionic radii and higher is the magnitude of positive charge or cations charge, smaller will be the ionic radii. Hence the correct sequence of ionic radii is $s^{-2} > Cl^- > Ar > Ca^{+2}$.

For reaction $Li + Cl \rightarrow Li^+ Cl^{\ominus}$
I. P_1 for Li = 520 KJ/mol
E. A for Cl = −349 KJ/mol
ΔH of given reaction = I. P_1 of Li + E. A of Cl
=520 - 349
74. = 171 KJ /mol

75. % of ionic character
$=16(x_A-x_B)+3.5(x_A-x_B)^2$
$=16(2.8)+3.5(2.8)^2$
=44.8+27.44=72.24



Frans

76. Both are e^- with drawing effect so, both cancle to each other.

77. Cs has lowest Ionisation enthalpy

78.
The atomic numbers of elements of second transition series means 4-d series lie in the range of y(Z=39) to cd(z=48)

79.
CCl_4 dipole moment =0
$CHCl_3$ dipole moment = 1. 010
CH_2Cl_2 dipole moment =1.570
CH_3Cl dipole moment=1.870

80.

The given order : B <C <N <O. Increasing first 199onization enthalpy is not according the property because the first 199onization enthalpy of N is greater than 'O' due to the presence of half-filled p-orbitals which gives more stability. Hence the correct order for increasing first 199onization enthalpy is

B <C <N>O.

81.

$48 - 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10}$

1	period	$1s^2$	2
2	period	$2s^2\ 2p^6$	8
3	period	$3s^2 3p^6$	8
4	period	$4s^2\ 3d^{10} 4p^6$	18
5	period	$5s^2\ 4d^{10}$	12

$\therefore 2 + 10 = 12$th group

82.

Lattice energy = LiF > NaF > RbF

Ionic character = NaF > NaCl > NaBr > NaI

Polarizability = $S^{2-} > O^{2-} > F^-$

83.

Basic nature of oxides depends upon the metallic character of the element. Hence the increasing order of basic nature of the given oxides is $Al_2O_3 < MgO < Na_2O < K_2O$.

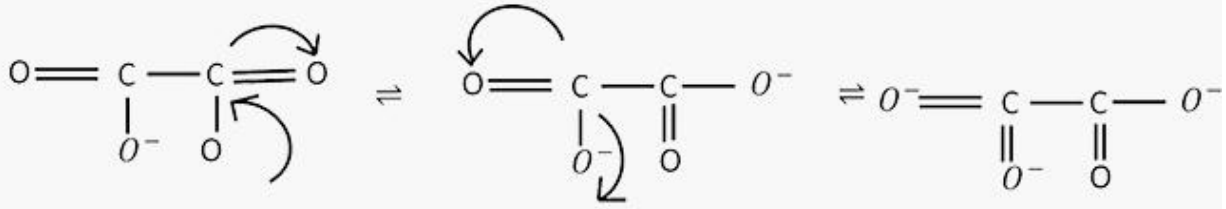
84.

No. of electrons are 14 and bond order three like Nitrogen.

85. Conceptual

86.

Resonating structure of oxalate ions



Total $14e^-$ involved in bonding

87.

$$F.r = \frac{charge\ present\ of\ anion}{atomic\ (ionic\ radii\ of\ cation\ (r^{\oplus})} = \text{covalent} \downarrow = \frac{x^{\oplus}}{r^{\oplus}\uparrow}$$

$$Cl^{\ominus} > F^{\ominus} \qquad Cl^{\ominus}\uparrow \alpha covalent\uparrow$$

Fajan's rule $= \frac{larger\ size\ anion}{smaller\ size\ cation}\ \alpha$ *covalent character in ionic compoubds*

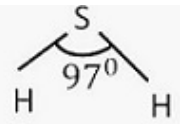
$Cl^{\ominus} > F^{\ominus}$

$AlCl_3 \rightarrow$ anhydrous –covalent $\rightarrow hydrous - ionic$

$AlCl_3 \rightarrow anhydrous \rightarrow ionic$

$\rightarrow hydrous \rightarrow ionic$

88.



$S - H = 0.72D$

$$\mu R = \sqrt{\mu_1^2 + \mu_2^2 + 2\mu_1\mu_2 cos\theta}$$

$$\mu R = \sqrt{(0.72)^2 + (0.72)^2 + 2(0.72)^2 \cos 97^0}$$

$$\mu R = 0.95D$$

89.

The pair of elements with atomic numbers 3 and 12 are Li and Mg. Both are S-block elements.

90.

The electronic configuration of the element in the atomic number 16 is $[Ne]3s^2 3p^4$. Hence in the periodic table it its placed in VI A group and III period.

91. Conceptual

92. flagella one lies longitudinally and the other transversely in a furrow between the wall plates

93. Conceptual

94. Genus is a Group of closely related species of plants or animals.

95. Mesosomes or chondrioids are folded invaginations in the plasma membrane of bacteria that are produced by the chemical fixation techniques used to prepare samples for electron microscopy.

96. Conceptual

97. The response to environmental stimuli is called as irritability

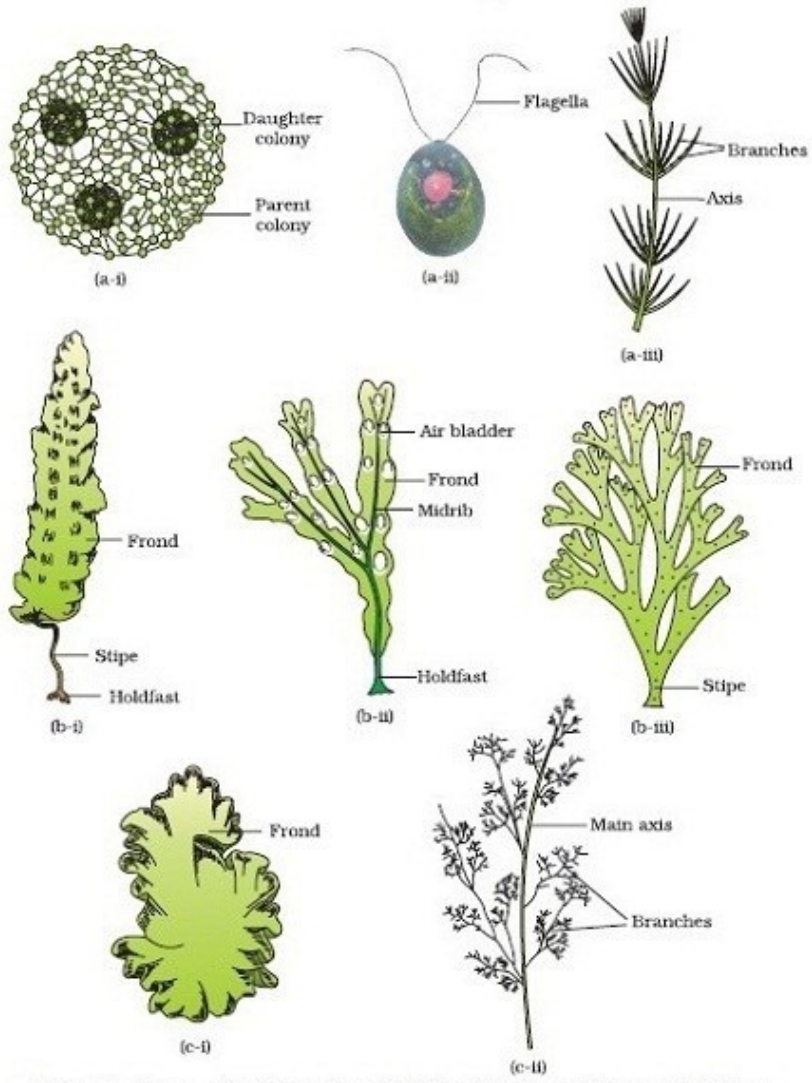
98. Conceptual

99. As we go higher from species to kingdom, the number of common characteristics goes on decreasing. Lower the taxa, more are the characteristics that the members within the taxon share. Higher the category, greater is the difficulty of determining the relationship to other taxa at the same level.

100. Conceptual

101. Conceptual

103.



Algae : (a) Green algae (i) *Volvox* (ii) *Chlamydomonas* (iii) *Chara*
(b) Brown algae (i) *Laminaria* (ii) *Fucus* (iii) *Dictyota*
(c) Red algae (i) *Porphyra* (ii) *Polysiphonia*

105. The statement ‘nothing lives forever, yet life continues’ illustrates the role of reproduction.

107. Plasmodium falciparun - A protozoan pathogen causing the most serious type of malaria.

108.
The a in the diagram represents Strobilus and b in the diagram represents Rhizome.

109. Multiplication by fragmentation is common to multicellular fungi, filamentous algae and protonema of mosses.

110. Bryophytes are gametophyte dominant, meaning that the more prominent, longer-lived plant is the haploid gametophyte. The diploid sporophytes appear only occasionally and remain attached to and nutritionally dependent on the gametophyte. On the other hand, Gametophytes are reduced and few celled in all vascular plants

113. *Spirogyra* is commonly known as pond silk, water silk, pond scum or mermaid's trees because of their bright green silky appearance. Each *non - motile* aplanospore germinates to form a new filament. In this type of isogamy, the entire protoplasmic contents of vegetative cells (viz., Gametangia) function as *gametes* .

114. Pteridophyta are highly evolved group among crptogams and they are called as vascular crptogams because of the conduction tissues called vascular bundles. Pteridophytes are vascular cryptogams which means they have vascular tissues such as xylem and phloem but they cannot produce flowers. Equisetum is one of the species of Pterdiophyta.

115. Toadstools and bracket fungi.

116. contractile vacuole. a membrane-enveloped cellular organelle, found in many microorganisms, that periodically expands, filling with water, and then contracts, expelling its contents to the cell exterior: thought to be important in maintaining hydrostatic equilibrium (osmoregulation).

118. In five kingdom classification of Whittaker, non-cellular organisms like viruses and viroids are not mentioned. Viruses did not find a place in classification since they are not truly 'living' and hence, they are considered as non-cellular.

119. In plants, algae and cyanobacteria, photosynthesis releases oxygen. This is called oxygenic photosynthesis. Although there are some differences between oxygenic photosynthesis in plants, algae, and cyanobacteria, the overall process is quite similar in these organisms.

Oscillatoria is a genus of filamentous cyanobacterium which is named after the oscillation in its movement.

128.

Peat Moss will usually lower the pH of garden soils, and can be helpful where the soil is too alkaline for the intended crop. Blueberries, which perform much better in acidic soils, will usually benefit from the addition of peat moss.
Decayed, dried sphagnum moss has the name of peat or peat moss. This is used as a soil conditioner which increases the soil's capacity to hold water and nutrients by increasing capillary forces and cation exchange capacity.

129.

Anthoceros is a genus of hornworts in the family Anthocerotaceae. The genus is global in its distribution. Its name means 'flower horn', and refers to the characteristic horn-shaped sporophytes that all hornworts produce.
The Bryopsida constitute the largest class of mosses, containing 95% of all moss species. It consists of approximately 11,500 species, common throughout the whole world.

130. Conceptual

131. Conceptual

132. Royal *Botanic Gardens*, *Kew* (brand name *Kew*) is a non-departmental public body in the United Kingdom sponsored by the Department for Environment.

133. Conceptual

134. Conceptual

142. Tetanus and typhoid are caused by bacteria. Whooping cough is caused by bacteria. Sleeping sickness is caused by parasitic flees. Syphilis is caused by bacteria while AIDS is the final stage of HIV viral disease. Measles and Rabies are caused by virus.

143. If the immune system fails to recognize 'self' from 'non-self' and starts destroying the body’s own cells, this leads to some malfunctions, which are termed as autoimmune diseases. Both rheumatoid arthritus and myasthenia gravis are autoimmune diseases. In rheumatoid arthritis, inflammation of the synovial membrane in synovial joints occurs. When this membrane, which is the source of synovial fluid, becomes inflamed, it produces too much fluid. Thus, the joints swell and become extremely painful. Myashtenia gravis is a chronic disease marked by abnormal fatigability and weakness of selected muscles. The degree of fatigue is so extreme that these muscles are temporarily paralysed. In this

disease, antibodies bind to cholinergic receptors on muscle cells, which impairs the ability of the neurotransmitter acetylcholine to induce muscle contraction.

144. Rabies, Influenza and AIDS are viral diseases, Amoebiasis, Ascariasis and Trypanosomiasis are caused by Protozoa; Taeniasis, Ascariasis and Elephantasis are the diseases caused by Helminths but Cancer, Tuberculosis and Tetanus are not related diseases. Tuberculosis and Tetanus are bacterial diseases while cancer is not.

168. More than 200 types lead to your misery, but the most common one is the rhinovirus, which is thought to be responsible for at least 50% of colds. Other viruses that can cause colds include coronavirus, respiratory syncytial virus, influenza and parainfluenza.

Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) is a spectrum of conditions caused by infection with the human immunodeficiency virus (HIV).