NTPL

PERIODIC TEST

Batch - 2006(M) [Medical]

Time : 3 Hours ***Maximum Marks : 720***

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

You are not allowed to leave the Examination Hall before the end of the test.

INSTRUCTIONS

1. This booklet is your Question Paper containing **180 questions**.
2. The test is of **3 hours** duration. The question paper consists of **3 sections** (Physics, Chemistry & Biology).
3. Each question carries **4 marks**. For each correct response the candidate will get **4 marks**. For each incorrect response, **one mark** will be deducted. The maximum marks are **720.**
4. Fill the bubbles completely and properly using a **Blue/Black Ball Point Pen** only.
5. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers, and electronic gadgets in any form are not allowed to be carried inside the examination hall.
6. The answer sheet, a machine-readable Optical mark recognition sheet (OMR Sheet), is provided separately.
7. DO NOT TAMPER WITH / MUTILATE THE OMR OR THE BOOKLET.
8. Do not break the seals of the question-paper booklet before being instructed to do so by the invigilator.

Name of the Candidate (in Capitals) _____

Test Centre _____ Centre Code _____

Candidate's Signature _____ Invigilator's Signature _____

1. A wheel of radius 1 m rolls forward half a revolution on a horizontal ground. The magnitude of the displacement of the point of the wheel initially incontact with the ground (in m) is :

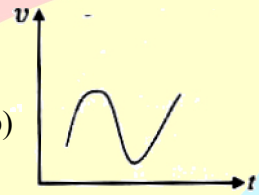
(a) 2π (b) $\sqrt{2}\pi$ (c) $\sqrt{\pi^2+4}$ (d) π

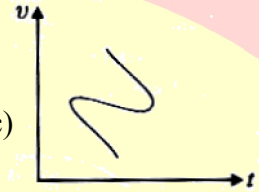
2. An aeroplane moves 400 m towards north, 300 m towards west and then 1200 m vertically upwards. Then its displacement from its initial position is :

(a) 1500 m (b) 1400 m (c) 1300 m (d) 1250 m

3. Which of the following velocity-time graphs shows a realistic situation for a body in motion?

(a) 

(b) 

(c) 

(d) 

4. Which of the following statements is **incorrect**?

(i) Displacement is independent of the choice of origin of the axis

(ii) Displacement may or may not be equal to the distance traveled

(iii) When a particle returns to its starting point its displacement is not zero

(iv) Displacement tells the nature of the actual motion of a particle between the points.

(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)

5. A body covers one third of the distance with velocity v_1, the second one third of the distance with a velocity v_2 and the remaining distance with a velocity v_3. The average velocity is

(a) $\frac{v_1+v_2+v_3}{3}$ (b) $\frac{v_1v_2v_3}{3}$ (c) $\frac{3v_1v_2v_3}{v_1v_2+v_2v_3+v_3v_1}$ (d) $\frac{v_1v_2+v_2v_3+v_3v_1}{3}$

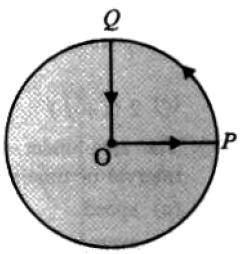
6. A particle moving in a straight line covers half the distance with speed 4 m/s. The other half of the distance is covered in two equal nine intervals with speed 5 ms^{-1} and 7 m/s respectively. The average speed of the particle during this motion is

(a) 6.4 ms^{-1} (b) 5.8 ms^{-1} (c) 48 ms^{-1} (d) 4.2 ms^{-1}

7. The ratio of the numerical values of the average velocity and average speed of a body is always

(a) unity (b) unity or less (c) unity or more (d) less than unity

8. A cyclist starts from the centre O of a circular park of radius one kilometre, reaches the edge P of the park, then cycles along the circumference and returns to the centre along QO as shown in the figure. If the round trip takes 10 minutes, the net displacement and average speed of the cyclist (in metre and kilometer per hour) is



(a) 0, 1 (b) $\frac{\pi+4}{2}$, 0

(c) 4, $\frac{\pi+4}{2}$ (d) 0, 21.4

9. The magnitude of average velocity is equal to the average speed when a point mass body moves

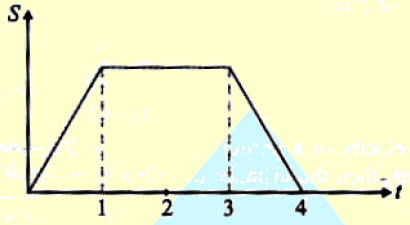
(a) with constant acceleration (b) with constant retardation

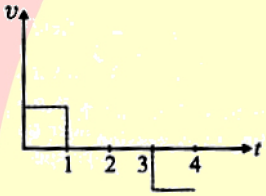
(c) in the same direction (d) on a curved path

10. The coordinates of a moving particle at time t are given by $x = ct^3$ and $y = bt^3$. The speed of the particle is:

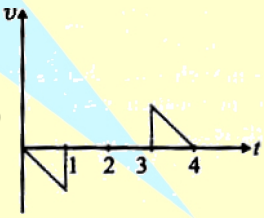
(a) $3t^2(c+b)$ (b) $3t^2\sqrt{c^2-b^2}$ (c) $t^2\sqrt{c^2+b^2}$ (d) $3t^2\sqrt{c^2+b^2}$

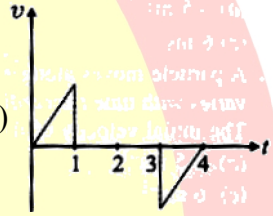
11. The displacement time graph of a body moving along a straight line is as shown in figure. Which of the following graphs figure represents the velocity-time graph for the motion of that body?



(a) 

(b) 

(c) 

(d) 

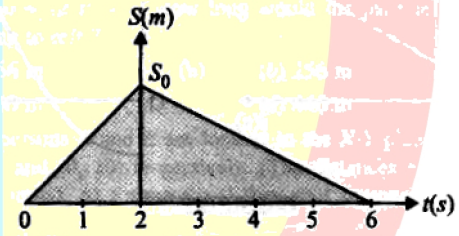
12. What will be the ratio of speed in first two seconds to the speed in next 4 seconds?

(a) $\sqrt{2}:1$

(b) 3 : 1

(c) 2 : 1

(d) 1 : 2



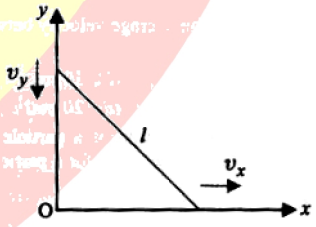
13. A rod of length l leans by its upper end against a smooth vertical wall, while its other end leans against the floor. The end that leans against the wall moves uniformly downwards. Then

(a) the other end also moves uniformly

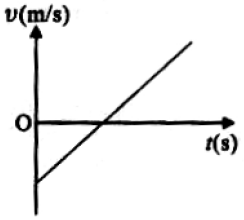
(b) the speed of other end goes on increasing

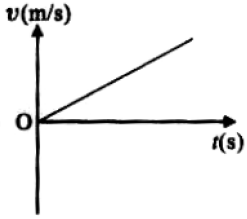
(c) the speed of other end goes on decreasing.

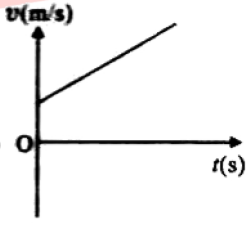
(d) the speed of other end first decreases and then increase

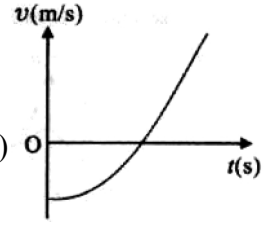


14. A particle moves along x axis in such a way that its x-coordinate varies with time t according to the equation $x = (8 - 4t + 6t^2)$ metre. The velocity of the particle will vary with time according to the graph:

(a) 

(b) 

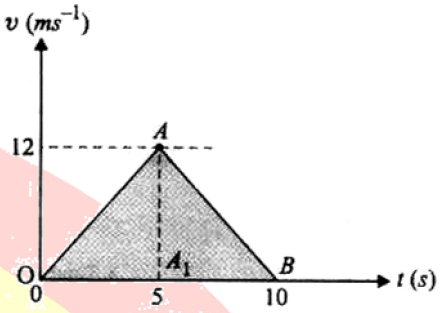
(c) 

(d) 

15. The position of an object moving along x-axis is given by $x = a + bt^2$, where $a = 8.5$ m and $b = 2.5$ ms^{-2} and t is measured in seconds. What is the instantaneous velocity at time $t = 2.0$ second?

(a) 5 ms^{-1} (b) 7.5 ms^{-1} (c) 10 ms^{-1} (d) 12.5 ms^{-1}

16. The speed-time graph of a particle moving along a fixed direction is shown in figure. What are the distance travelled and the average speed of the particle over the time interval $t = 0$ to $t = 10$s?



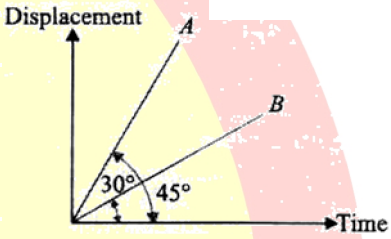
(a) 50 m; 5 ms^{-1}

(b) 60 m; 6 ms^{-1}

(c) 40 m, 4 ms^{-1}

(d) 70 m, 7 ms^{-1}

17. Two straight lines A and B drawn on the same displacement-time graph make angles 45° and 30° with time axis respectively, figure. The ratio of velocity of A to the velocity of B is :



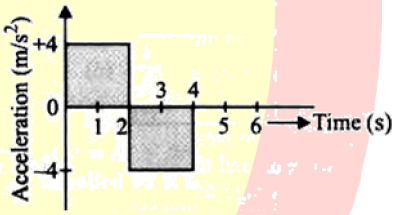
(a) $\sqrt{3}$

(b) $\frac{1}{\sqrt{3}}$

(c) 3

(d) 3 / 2

18. A particle starts from rest at $t = 0$ and moves in a straight line with an acceleration as shown in figure. The velocity of the particle at $t = 3$ s is



(a) 2 ms^{-1}

(b) 4 ms^{-1}

(c) 6 ms^{-1}

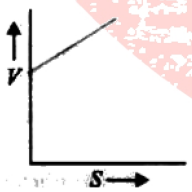
(d) 8 ms^{-1}

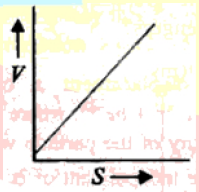
19. If for a particle position $x \propto t^2$ then

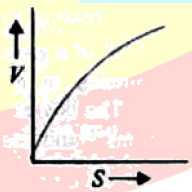
(a) velocity is constant (b) acceleration is constant

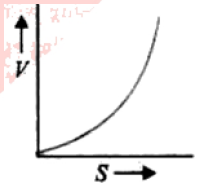
(c) acceleration is variable (d) none of these

20. A body starting from rest moves along a straight line with a constant acceleration. The variation of speed (V) with distance (S) is represented by the graph

(a) 

(b) 

(c) 

(d) 

21. Calculate the mass of CH_4 in a 9 liters cylinder at 16atm and 27ºC?

(a) 94 g (b) 47 g (c) 141 g (d) None of these

22. Find the pressure exerted by 10^{23} gas molecules each of mass 10^{-23}g in a container of volume 2liters. Given V_{rms}=1000m/s?

(a) 1.37atm (b) 1.67atm (c) 1.97atm (d) None of these

23. At a certain pressure and 127ºC the mean K.E of hydrogen molecules is 8×10^{-21}J. What is the mean K.E of hydrogen molecules at same pressure and at a temperature 27ºC?

(a) 6×10^{-19}J (b) 6×10^{-20}J (c) 6×10^{-21}J (d) None of these

24. The rms speed of hydrogen at NTP is v m/s. If the gas is heated at constant pressure till its volume is three folds, what will be its final temp and rms speed?

(a) $819k\sqrt{3}v$ m/s (b) $409k\sqrt{3}v$ m/s (c) $204k\sqrt{3}v$ m/s (d) None of these

25. Calculate the temperature of sun. Given the density of sun is 1.4g/cc, pressure is 1.4×10^{9}atm and average molecular weight of gases in the sun is 2.

(a) 2.4×10^{6}k (b) 2.4×10^{7}k (c) 2.4×10^{8}k (d) None of these

26. Find the temp at which rms velocity of a gas will be half of its value at 0ºC, pressure remaining constant?

(a) 68.25K (b) 34.25K (c) 102.25K (d) None of these

27. Calculate the diameter of a molecule if $n=2.79\times10^{25}$ molecules per m^3 and mean free path is 2.2×10^{-8}m?

(a) 0.101nm (b) 0.303nm (c) 0.606nm (d) None of these

28. A mixture of hydrogen and nitrogen has volume 2000cc, temp 300k, pressure 100kpa and mass 0.76g. Calculate the masses of hydrogen and nitrogen in the mixture?

(a) 0.6g, 0.32g (b) 0.12g, 0.64g (c) 0.18g, 0.96g (d) None of these

29. Two closed vessels of equal volume contains air at 105kpa, 300k and are connected through a narrow tube. If one of the vessels is now maintained at 300k and the other at 400k, what will the pressure in the vessel?

(a) 30kpa (b) 60kpa (c) 120kpa (d) None of these

30. A vessel contains 14g of hydrogen and 96g of oxygen at STP. Find the volume of vessel? Chemical reaction is induced in it by passing electric spark till one of the gas is consumed. The temp is brought back to its starting value 273k. Find the pressure in the vessel?

(a) $0.23m^3$, 0.1atm (b) $0.46m^3$, 0.1atm (c) $0.69m^3$, 0.1atm (d) None of these

31. Calculate the rms speed of nitrogen at STP[pressure = 1atm and temperature = 0°C]. The density of nitrogen in these conditions is 1.25 kg/m^3.

(a) 245m/s (b) 490m/s (c) 735m/s (d) None of these

32. If the rms speed of nitrogen molecules is 490 m/s at 273K then find rms speed of hydrogen molecules at the same temp.?

(a) 915m/s (b) 1830m/s (c) 2745m/s (d) None of these

33. Find rms speed of oxygen molecules at 300K?

(a) 483m/s (b) 241m/s (c) 724m/s (d) None of these

34. A barometer reads 75 cm of mercury. When $2cm^3$ of air at atmospheric pressure is introduced into the space above the mercury level the volume of this space becomes 50 cm^3. Find the length by which mercury column descends?

(a) 1cm of Hg (b) 2cm of Hg (c) 3cm of Hg (d) None of these

35. A barometer tube is 1m long and $2cm^2$ in cross section. Mercury stands to a height of 75 cm in the tube. When a small amount of oxygen is introduced in the space above the mercury level, the level of mercury falls by 5 cm. Calculate the mass of oxygen introduced. Room temp. = 27°C, g = 10 m/s^2 and density of mercury is 13600 kg/m^3?

(a) 2.62mg (b) 7.86mg (c) 5.24mg (d) None of these

36. 1 kg of water is contained in a 1.25 kW kettle. Calculate the time taken for the temperature of water to rise from 25ºC to its boiling point 100ºC. Specific heat capacity of water is 4.2 j/gk.

(a) 4 mins 12s (b) 2 mins 6s (c) 6 mins 18s (d) None of these

37. 50g of ice at 0ºC is added to 300g of liquid at 30ºC. Find the final temperature of mixture when all the ice has melted. Specific heat capacity of water is 4.2 j/gk, specific heat capacity of liquid is 2.65j/gk and latent heat of melting of ice is 336j/g?

(a) Nearly 3ºC (b) Nearly 5ºC (c) Nearly 7ºC (d) None of these

38. 2 kg of ice melts when water at 100ºC is poured in a hole drilled in a block of ice. What was the mass of water used? Specific heat capacity of water is 4200 j/kgk and latent heat of fusion of ice is 336 j/g.

(a) 1.6kg (b) 1.4kg (c) 1.2kg (d) None of these

39. 350g of water at 30ºC is contained in a copper vessel of 50g. Calculate the mass of ice required to bring down the temperature of vessel and its contents to 5ºC. Given that the specific latent heat of fusion of ice is 336j/g, specific heat capacity of copper is 0.4j/gk and specific heat capacity of water is 4.2j/gk.

(a) 52g (b) 104g (c) 156g (d) None of these

40. A molten metal of mass 150g is kept at its melting point of 800ºC and when it is allowed to freeze at the same temp then it liberates 75000J of heat energy. Calculate the specific latent heat of metal?

(a) 500j/g (b) 250j/g (c) 300j/g (d) None of these

41. Calculate the power of an electric heater required to melt 1kg ice at 0ºC in 30s, if the efficiency of heater is 40%. Take the specific latent heat of ice as 336j/g.

(a) 14kw (b) 28kw (c) 42kw (d) None of these

42. A vessel of mass 100g contains 150g of water at 30ºC. How much ice is needed to cool it to 5ºC? Take specific heat capacity of material of vessel as 0.4 j/gk, specific latent heat of fusion of ice as 336 j/g and specific heat capacity of water as 4.2 j/gk.

(a) 46.92g (b) 23.46g (c) 70.38g (d) None of these

43. What mass of a liquid A of specific heat capacity 0.84j/gk and at a temp of 40ºc must be mixed with 100g of liquid B of specific heat capacity 2j/gk and at 20ºC, so that the temperature of mixture becomes 32ºC?

(a) 179g (b) 537g (c) 358g (d) None of these

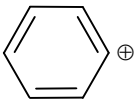
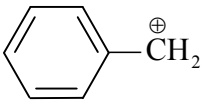
44. A calorimeter of water equivalent 15g contains 165g of water at 25ºc. Steam at 100ºc is passes through it for some time. The temperature is increased to 30ºc and the mass of calorimeter and its content rises by 1.5g. Calculate the specific latent heat of vaporization of water? Specific heat capacity of water is 1cal/gk.

(a) 530cal/g (b) 265cal/g (c) 795cal/g (d) None of these

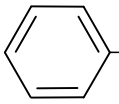
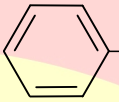
45. A lead bullet penetrates into a solid object and melts. Assuming that 50% of its kinetic energy was used to heat it, calculate the initial speed of bullet? The initial temp of the bullet is 27ºC and its melting point is 327ºC. Latent heat of fusion of lead is 25 j/g and specific heat capacity of lead is 0.125j/gk.

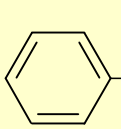
(a) 500m/s (b) 250m/s (c) 750m/s (d) None of these

46. Which is the most stable carbocation?

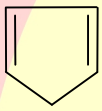
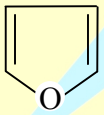
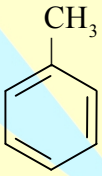
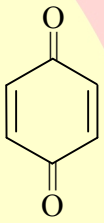
(a) $(CH_3)_3\overset{\oplus}{C}$ (b)  (c)  (d) $(CH_3)_2\overset{\oplus}{C}H$

47. Which comparison is not correct as indicated?

(a)  $OH > CH_3OH$ (acidic nature) (b)  $NH_2 > CH_3NH_2$ (basic nature)

(c)  $\overset{\oplus}{C}H_2 > CH_3\overset{\oplus}{C}H_2$ (stability) (d)  $COH > CH_3COH$ (acidic nature)

48. Which is maximum acidic?

(a)  (b)  (c)  (d) 

49. Increasing order of pK_a values $(pK_a = -\log K_a)$ of H_2O, CH_3OH and C_6H_5OH is

(a) $H_2O < CH_3OH < C_6H_5OH$ (b) $CH_3OH < H_2O < C_6H_5OH$

(c) $C_6H_5OH < H_2O < CH_3OH$ (d) $C_6H_5OH < CH_3OH < H_2O$

50. Select the incorrect statement.

(a) Electron-withdrawing inductive effect of the carbonyl group in —COOH group weakens the O—H bond and favours ionisation of a carboxylic acid compared with an alcohol

(b) Inductive effect of the chlorine destabilises the acid and stabilizes the conjugate base

(c) Aniline is a weaker base than ammonia

(d) Phenol is a weaker acid than water

51. Inductive effect involves :

(a) Delocalisation of σ- electrons (b) Partial displacement of σ- electrons

(c) Delocalisation of π- electrons (d) Displacement of lone pair electrons

52. Select correct statement about I effect ?

(a) I effect transfers electrons from one carbon atom to another

(b) I effect is the polarisation of σ bond electrons

(c) I effect creates net charge in the molecule

(d) I effect is distance independent

53. Which of the following group shows +I-effect :

(a) –Br (b) –COOH (c) –OR (d) $-COO^-$

54. Which of the following alkyl groups has the maximum +I effect?

(a) $(CH_3)_2CH-$ (b) $(CH_3)_3C-$ (c) CH_3CH_2- (d) CH_3^-

55. Decreasing –I effect of given groups is :

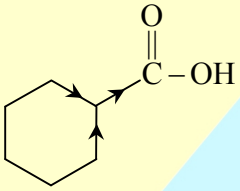
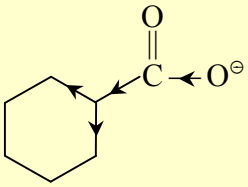
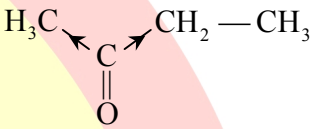
(i) CN (ii) NO_2 (iii) NH_2 (iv) F

(a) iii > ii > i > iv (b) ii > iii > iv > i (c) iii > ii > iv > i (d) ii > i > iv > iii

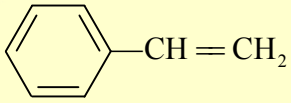
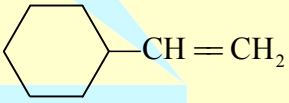
56. Which of the following is the strongest –I group :

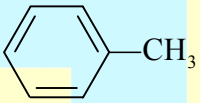
(a) $-\overset{+}{N}F_3$ (b) $-\overset{+}{N}H_3$ (c) $-\overset{+}{S}(CH_3)_2$ (d) –F

57. In which of the following species, incorrect direction of inductive effect is shown ?

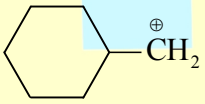
(a)  (b)  (c)  (d) 

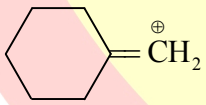
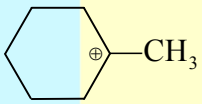
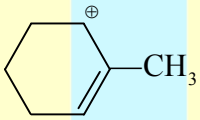
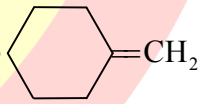
58. Maximum hyperconjugation is observed in

(a)  (b) 

(c) $(CH_3)_3C-CH=CH_2$ (d) 

59. Following carbocation changes to more stable carbocation



(a)  (b)  (c)  (d) 

60. In the following, electrophile is $HO-NO_2$

(a) $H^{\oplus}$ (b) $NO_3^{\oplus}$ (c) $NO_2^{\oplus}$ (d) $OH^{\ominus}$

61. The observed dipole moment of HCl molecule is 1.03 D. If H–Cl bond distance is 1.275 Å and electronic charge is 4.8×10^{-10} e.s.u. The % polarity in HCl will be

(a) 1.275×1.03 % (b) $\frac{4.8\times1.275\times10^{-8}}{1.03}$ %

(c) $\frac{1.03\times100}{4.8\times1.275}$ % (d) $\frac{4.8\times10^{-10}}{1.03}\times100\%$

62. Which of the following has same bond order as NO^+ has?

(a) CN^- (b) O_2^- (c) CN^+ (d) none of them

63. Among KO_2, AlO_2^-, BaO_2 and NO_2^+, unpaired electron is present in

(a) NO_2^+, BaO_2 (b) KO_2 and AlO_2^- (c) KO_2 only (d) BaO_2 only

64. The hybridisation and shape of ClO_3^- is

(a) sp^3 and tetrahedral (b) sp^3 and triangular pyramidal

(c) sp^3 and triangular planar (d) sp^3d and trigonal bipyramidal

65. The correct order of increasing covalent character of the following is

(a) $SiCl_4 < AlCl_3 < CaCl_2 < KCl$ (b) $KCl < CaCl_2 < AlCl_3 < SiCl_4$

(c) $AlCl_3 < CaCl_2 < KCl < SiCl_4$ (d) none of these

66. Which of the following is planar?

(a) XeO_4 (b) XeO_2F_2 (c) XeO_3F_2 (d) XeF_4

67. Which of the following does not contain coordinate bond?

(a) BH_4^- (b) NH_4^+ (c) CO_3^{2-} (d) H_3O^+

68. The correct order in which the O–O bond length increases in the following is

(a) $O_2 < O_3 < H_2O_2$ (b) $H_2O_2 < O_3 < O_2$ (c) $O_3 < O_2 < H_2O_2$ (d) $O_2 < H_2O_2 < O_3$

69. Which concept best explains that o-nitrophenol is more volatile than p-nitrophenol?

(a) Resonance (b) Steric hinderance (c) Hydrogen bond (d) Hyperconjugation

70. Which species has the maximum number of lone pair of electrons on the central atom?

(a) ClO_3^- (b) XeF_4 (c) SF_4 (d) I_3^-

71. Molecular orbital electronic configuration for X_2^{n-} anion is

$$KK^*(\sigma 2s)^2(\overset{*}{\sigma} 2s)^2(\pi 2p_x)^2(\pi 2p_y)^2(\sigma 2p_z)^2(\overset{*}{\pi} 2p_x)^1$$

The anion X_2^{n-} is

(a) N_2^- (b) O_2^- (c) N_2^{2-} (d) O_2^{2-}

72. Among the following compounds, the one that is polar and has the central atom with sp^2 hybridization is

(a) H_2CO_3 (b) SiF_4 (c) BF_3 (d) $HClO_2$

73. In which of the following species the bond angle around the central atom is equal to 120º?

(I) BF_3 (II) BCl_3 (III) BF_4^- (IV) SO_3

(a) (I) (b) (I), (II) and (IV)

(c) (II) and (IV) (d) (I) and (III)

74. Which among the following species is most stable?

(a) He_2 (b) He_2^+ (c) He_2^{2+} (d) H_2

75. If MX_3 is T shaped, then the number of lone pair around M is

(a) 2 (b) 0 (c) 3 (d) 5

76 Out of the four planar molecules given below which one has μ (dipole moment) = 0?

(a) cis–ClCH=CHCl (b) trans–ClCH=CHCl

(c) CH_2=CHCl (d) CH_2=CCl_2

77. In the formation of N_2^+ from N_2, the electron is lost from a

(a) σ–orbital (b) π–orbital (c) σ^*–orbital (d) π^*–orbital

78. Which of the following is arranged in order of increasing dipole moment?

(a) $BCl_3 < NH_3 < H_2O < NF_3$ (b) $BCl_3 < NF_3 < NH_3 < H_2O$

(c) $NH_3 < NF_3 < H_2O < BCl_3$ (d) $H_2O < NF_3 < NH_3 < BCl_3$

79. Which pair is isostructural and possesses same number of lone pair of electron on central atom?

(a) IF_5 and $XeOF_4$ (b) NH_3 and ClO_4^- (c) $SnCl_4$ and ClO_3^- (d) $AlCl_3$ and SO_2

80. Arrange the following compounds in order of increasing dipole moment:

(i) toluene (ii) m–dichlorobenzene

(iii) o–dichlorobenzene (iv)p–dichlorobenzene

(a) (i) < (iv) < (ii) < (iii) (b) (iv) < (i) < (ii) < (iii)

(c) (iv) < (i) < (iii) < (ii) (d) (iv) < (ii) < (i) < (iii)

81. What is the maximum mass (in grams) of NO that could be obtained from 15.5 g of N_2O_4 and 4.68 g of N_2H_4 when they react? The balanced equation is

$$2N_2O_4 + N_2H_4 \longrightarrow 6NO + 2H_2O$$

(a) 4.38 (b) 5.04 (c) 15.2 (d) 26.2

82. A 7.66 g sample of hydrated sodium sulphate $Na_2SO_4 \cdot xH_2O$ forms 4.06 g of anhydrous Na_2SO_4. What is the value of x ? (M Na_2SO_4 = 142)

(a) 0.2 (b) 3.0 (c) 5 (d) 7

83. Silver metal reacts with HNO_3 according to equation

$$3Ag(s) + 4HNO_3(g) \longrightarrow 3AgNO_3(g) + NO(g) + 2H_2O(l)$$

What volumes of 1.15 M HNO_3 (aq) is required to react with 0.784 g of Ag?

(a) 4.74 mL (b) 6.32 mL (c) 8.43 mL (d) 25.3 mL

84. How many grams of NaBr could be formed if 14.2 g of NaI are reacted with 40.0 mL of a 0.800 M Br_2?

$$2NaI + Br_2 \longrightarrow 2NaBr + I_2$$

(a) 3.30 (b) 4.80 (c) 6.59 (d) 9.75

85. If 0.5 moles of $BaCl_2$ is mixed with 0.2 moles of Na_3PO_4, the maximum moles of $Ba_3(PO_4)_2$ obtained is

(a) 0.2 (b) 0.5 (c) 0.3 (d) 0.1

86. The mass of Mg_3N_2 produced if 48 g of Mg metal is reacted with 34 g NH_3 gas is

$$3\ Mg + 2\ NH_3 \longrightarrow Mg_3N_2 + 3H_2$$

(a) $\frac{200}{3}$ (b) $\frac{100}{3}$ (c) $\frac{400}{3}$ (d) $\frac{150}{3}$

87. A mixture of N_2 and H_2 is caused to react in a closed container to form NH_3. The reaction ceases before either reactant has been totally consumed. At this stage, 2.0 moles each of N_2, H_2 and NH_3 are present. The moles of N_2 and H_2 present originally were respectively,

(a) 4 and 4 moles (b) 3 and 5 moles (c) 3 and 4 moles (d) 4 and 5 moles

88. How many moles of P_4 can be produced by reaction of 0.10 moles $Ca_5(PO_4)_3F$, 0.36 moles SiO_2 and 0.90 moles C according to the following reaction ?

$$4Ca_5(PO_4)_3F + 18\ SiO_2 + 30C \longrightarrow 3P_4 + 2CaF_2 + 18CaSiO_3 + 30\ CO$$

(a) 0.060 (b) 0.030 (c) 0.045 (d) 0.075

89. For a reaction,

$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$; identify dihydrogen (H_2) as a limiting reagent in the following reaction mixtures.

(a) $56g$ of $N_2 + 10g$ of H_2 (b) $28g$ of $N_2 + 6g$ of H_2

(c) $35g$ of $N_2 + 8g$ of H_2 (d) $14g$ of $N_2 + 4g$ of H_2

90. Consider the following reaction, $2H_2 + O_2 \longrightarrow 2H_2O$

What gram of H_2O is formed if 2 g of H_2 reacts with 1 g of O_2?

(a) 3.0 g (b) 1.125 g (c) 4.5 g (d) 2.50 g

91. Pteridophytes:

(a) Include horsetails and ferns

(b) Are used for medicinal purposes and soil binders

(c) Are also frequently grown as ornaments

(d) All are correct

92. The pteridophytes:

(a) Are found in cool, damp and shady places (b) May be found in sandy soil

(c) Require water for fertilization (d) More than one option is correct

93. Read the following statements w.r.t. pteridophytes:

(i) Majority of the pteridophytes are heterosporous

(ii) Selaginella and Salvinia are homosporous

(iii) The megaspore germinate to form male gametophyte

(iv) Pteridophytes may show seed formation in few cases

(v) *Selaginella* is a type of fern

How many of the above statements are incorrect?

(a) Five (b) Two (c) Three (d) Four

94. Match the columns

Column – I	***Column – II***
A. Psilopsida	(i) Dryopteris, Pteris and Adiantum
B. Lycopsida	(ii) Equisetum
C. Sphenopsida	(iii) Selaginella and Lycopodium
D. Pteropsida	(iv) Psilotum

(a) A - (i), B = (iv), C = (iii), D = (ii) (b) A = (ii), B = (iv), C = (iii), D = (i)

(c) A = (i), B = (ii), C = (iii), D = (iv) (d) A = (iv), B = (iii), C = (ii), D = (i)

95. An aquatic fern is:

(a) *Salvinia* (b) Dryopteris (c) *Lycopodium* (d) *Equisetum*

96. In gymnosperms:

(a) Ovules are not enclosed by ovary

(b) Ovules remain exposed both before and after fertilization

(c) Seeds are naked and not covered by fruit

(d) All are correct

97. Read the following statements:

(i) The redwood tree, Sequoia, is one of the tallest tree species

(ii) Mycorrhizal roots are found in Pinus and coralloid roots in Cycas

(iii) The roots of gymnosperms are generally tap roots

(iv) In gymnosperms, stems may be unbranched (e.g., *Pinus*) or branched (e.g., *Cycas*)

(v) In *Cycas*, the pinnate leaves persist for a few years

How many of the above statements are correct?

(a) Four (b) Five (c) Two (d) Three

98. In gymnosperms:

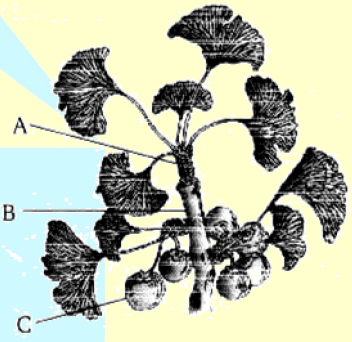
(a) The megaspore mother cell divides meiotically to form four megaspores

(b) One of the megaspores enclosed within the megasporangium develops into a multicellular female gametophyte that bears two or morel archegonia

(c) The multicellular female gametophyte is also retained within the megasporangium

(d) All are correct

99. Identity the plant and the structures marked A, B and C:



(a) *Pinus*, A = Long shoot, B = Dwarf shoot, C = Seed

(b) *Cycas*, A = Long shoot, B = Dwarf shoot, C = Seed

(c) *Ginkgo*, A = Long shoot, B = Dwarf shoot, C = Fruits

(d) *Ginkgo*, A = Dwarf shoot, B = Long shoot, C = Seed

100. Select the correct incorporation sequence of one structure within the other in a gymnosperm:

(a) Spores → Sporophylls → Strobilus → Sporangia

(b) Sporangia → Spores → Sporophylls → Strobilus

(c) Sporangia → Strobilus → Sporophylls → Spores

(d) Spores → Sporangia → Sporophylls → Strobilus

101. Read the following statements w.r.t. gymnosperms:

(i) Endosperm is haploid and represents the female gametophyte

(ii) *Pinus* is a monoecious plant

(iii) They show siphonogamy

(iv) *Cycas* shows both zooidogamy and siphonogamy

(v) *Pinus* and *Cedrus* have branched stem

How many of the above statements are correct?

(a) Four (b) Three (c) Five (d) Two

102. Gymnosperms do not form:
(a) Shrubs (b) Tall trees (c) Short trees (d) Herbs

103. Select the haploid structure of gymnosperms:
(a) Embryo, endosperm, megaspore (b) Leaf, embryo, endosperm
(c) Pollen, embryo, endosperm (d) Endosperm, pollen, megaspore

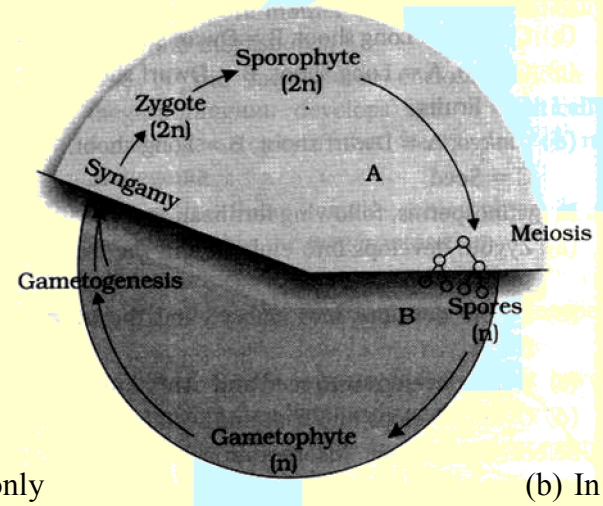
104. Heterospory is found in all members of _____ and few members of _____:
(a) Spermatophytes, pteridophytes (b) Pteridophytes, spermatophytes
(c) Bryophytes, pteridophytes (d) Pteridophytes, gymnosperms

105. Flowers are present in:
(a) Gymnosperms (b) Angiosperms (c) Pteridophytes (d) Bryophytes

106. Pollination in gymnosperms is mainly:
(a) Anemophilous (b) Hydrophilous (c) Entomophilous (d) Ornithophilous

107. Double fertilization is a characteristic of:
(a) Angiosperms (b) Gymnosperms (c) Bryophytes (d) Pteridophytes

108. The life cycle pattern shown below is seen in which group of plants?



(a) In algae only (b) In bryophytes and pteridophytes
(c) In gymnosperms only (d) In algae and gymnosperms

109. Match the following columns:

Column-I	*Column-II*
A. Organ-system level organisation	(i) Platyhelminthes
B. Tissue level organisation	(ii) Poriferans
C. Organ level organisation	(iii) Ctenophores and coelenterates
D. Cellular level organisation	(iv) Aschelminthes, annelids, arthropods, molluscus, echinoderms and chordates

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

110. How many of the examples mentioned below possess closed (C) and open (O) circulatory system?

Cephalopod molluscs, non-cephalopod molluscs, Chordates, Annelids, Tunicates, Hemi-chordates and Arthropods

(a) C = 2, O = 5 (b) C = 4, O = 3 (c) C = 5, O = 2 (d) C = 3, O = 4

111. Find the incorrect match w.r.t. body plan:

(a) Tube – within-tube body plan	:	Nemathelminthes, Annelida, Arthropoda Mollusca, Echinodermata Chordata
(b) Cell-aggregate type body plan	:	Coelenterates
(c) Blind-sac type body plan	:	Platyhelminthes and Coelenterates
(d) Cell-aggregate type body plan	:	Porifera

112. Metamerism is absent in:

(a) Annelids (b) Platyhelminthes (c) Arthropods (d) Chordates

113. Read the following statements about the phylum Porifera:

(i) Commonly known as sponges

(ii) Are generally found in freshwater and are mostly symmetric animals

(iii) Possess water transport canal system

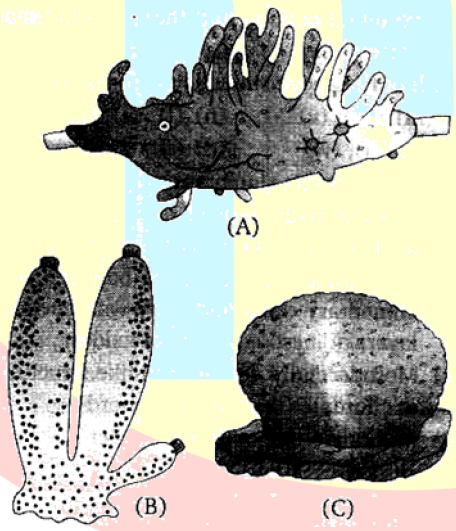
(iv) The body is supported by endoskeleton made up of spicules or spongin fibres

(v) Fertilization is external

Which of the above statements are correct?

(a) (iii), (v) (b) (i), (ii), (iii) (c) (i), (hi), (iv) (d)(ii), (v)

114. Identify the figure A, B and C



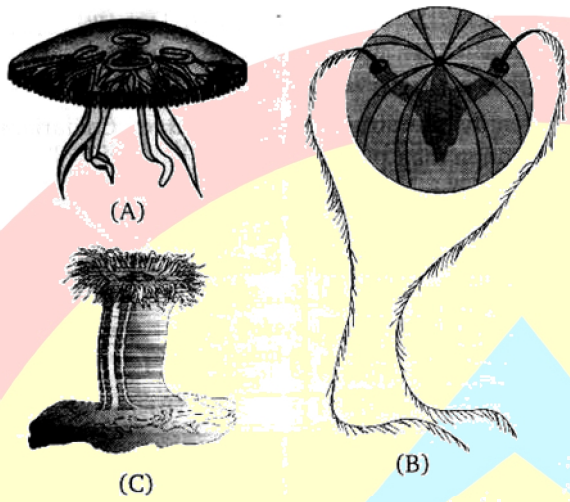
	A	*B*	*C*
(a)	Euspongia	Spongilla	Sycon
(b)	Spongilla	Euspongia	Sycon
(c)	Spongilla	Sycon	Euspongia
(d)	Sycon	Euspongia	Spongilla

115. Which of the following is an important evolutionary development seen for the first time in the sponges?

(a) Multicellular structure (b) Bilateral symmetry

(c) Intracellular digestion (d) Presence of nerve net/nerve cells

116. Identify the organisms A, B and C:



	A	*B*	*C*
(a)	Pleurobrachia	Adamsia	Aurelia
(b)	Aurelia	Adamsia	Pleurobrachia
(c)	Pleurobrachia	Aurelia	Adamsia
(d)	Aurelia	Pleurobrachia	Adamsia

117. Read the following statements w.r.t. cnidarians:

(i) Cnidarians exhibit tissue level of organisation and are triploblastic

(ii) Digestion is extracellular and intracellular

(iii) Corals secrete calcium bicarbonate to form a soft skeleton commonly

(iv) Corals may harbour some photosynthetic dinoflagellates for taking nutrition

(v) They possess a central gastro-vascular cavity with a single opening, mouth on hypostome.

Which of the above statements are correct?

(a) (i), (iii) (b) (i), (ii), (iii) (c) (ii), (iv), (v) (d)(iii), (iv)

118. *Meandrina* is:

(a) Brain coral (b) Sea fan (c) Sea anemone (d) Sea pen

119. Which of the following is correct for ctenophores?

(a) Their body bears eight external rows of ciliated comb-plates which help in locomotion

(b) Tentacles if present help in locomotion only

(c) Both (a) and (b)

(d) Sexes are separate

120. In *Fasciola*:

(a) Fertilization is internal and development is through many larval stages

(b) Flame cells are absent

(c) Cross-fertilization is absent

(d) True coelom is present

121. Which of the following is an odd one out w.r.t. the phylum Platyhelminthes?

(a) *Wuchereria* (b) Taenia (c) *Fasciola* (d) *Planaria*

122. Read the following statements w.r.t. aschelminthes:

(i) Are diploblastic and pseudocoelomate animals

(ii) Their body is circular in cross-section so, are called round worms

(iii) Alimentary canal is incomplete

(iv) Muscular pharynx is present

(v) Are hermaphrodites

123. Read the following statements w.r.t. Aschelminthes/ Nemathelminthes:

(i) Development may be direct or indirect

(ii) Fertilization is internal

(iii) Females are often shorter than males

(iv) *Wuchereria* causes elephantiasis or filariasis

(v) *Ascaris* possess cuticle which is resistant to the digestive enzymes of host.

Which of the above statements are correct?

(a) (ii), (iii), (iv), (v) (b) (i), (ii), (iv), (v) (c) (i), (ii), (hi) (d) (iii), (iv), (v)

124. *Wuchereria* gets transmitted to healthy person through:

(a) Tse tse fly (b) Culex (c) *Anopheles* (d) Fruit fly

125. Parapodia in *Nereis* help in:

(a) Swimming (b) Locomotion

(c) Respiration (d) More than one option is correct

126. In Annelids:

(a) Neural system consists of paired ganglia connected by lateral nerves to a double ventral nerve cord

(b) Reproduction occur both asexually and sexually

(c) Like Nereis, Pheretima and Hirudinaria have monoecious condition

(d) Aquatic forms are completely absent

127. Read the following statements w.r.t. Arthropoda:

(i) Circulatory system is of open type

(ii) Eyes may be compound or simple

(iii) Are mostly monoecious

(iv) Are mostly viviparous

(v) Development may be direct or indirect

Which of the above statements are correct?

(a) (ii), (iii), (iv) (b) (i), (ii), (v) (c) (iii), (iv), (v) (d) (i), (ii), (iii)

128. Match the columns:

Column – I	***Column – II***
A. Malpighian tubules	(i) Sponges
B. Canal system	(ii) Leech
C. Hirudin	(iii) Insects
D. Nematocysts	(iv) Hydra

(a) A = (i), B = (iv), C = (ii), D m (iii) (b) A = (iii), B = (ii), C = (iv), D = (i)

(c) A = (iii), B = (i), C = (ii), D = (iv) (d) A = (i), B = (ii), C = (iv), D = (iii)

129. Match the columns:

Column-I	***Column-II***
A. Gills	(i) King crab
B. Tracheal system	(ii) Crab, prawn
C. Book gills	(iii) Butterfly, cockroach
D. Book lings	(iv) Scorpion spider

(a) A = (ii), B = (iii), C = (i), D = (iv) (b) A = (ii), B = (i), C = (iv), D = (iii)

(c) A = (iii), B = (ii), C = (i), D = (iv) (d) A = (iv), B = (i), C = (ii), D = (iii)

130. Match the columns:

Column-I	**Column-II**
A. *Pila*	(i) *Devil fish*
B. Octopus	(ii) *Pearl oyster*
C. Pinctada	(iii) Sea-hare
D. *Aplysia*	(iv) Apple snail

(a) A = (ii), B = (iii), C = (i), D = (iv) (b) A = (iv), B = (i), C = (iii), D = (ii)

(c) A = (ii), B = (i), C = (iii), D = (iv) (d) A = (iv), B = (i), C = (ii), D = (iii)

131. The body of molluscs:

(a) Usually remains covered by a calcareous shell

(b) Possess segmentation

(c) Possess distinct head, visceral hump but lack muscular foot

(d) Lack bilateral symmetry

132. Which of the following is an echinoderm?

(a) *Ophiura* (b) *Octopus* (c) *Apis* (d) *Dentalium*

133. Read the following statements w.r.t. Echinodermata:

(i) Are exclusively marine

(ii) Digestive system in incomplete

(iii) Tube feet is universally absent

(iv) Are spiny bodied

(v) The adults are radially symmetrical but larvas are bilaterally symmetrical.

Which of the above statements are correct?

(a) (i), (iv), (v) (b) (i), (ii), (iii) (c) (ii), (iii) (d) (iv) and (v) only

134. Read the following w.r.t. hemichordates:

(i) Are exclusively fresh water organisms

(ii) Possess metameric segmentation

(iii) Body is cylindrical

(iv) Respiration occur through gills

(v) Excretion of nitrogenous waste occurs through proboscis gland

Which of the above statements are correct?

(a) (iii), (iv), (v) (b) (i), (ii) (c) (i), (iii) (d) (ii), (iv), (v)

135. Which of the following is incorrect?

	Non-chordates	***Chordates***
(a)	Heart is dorsal (if present)	Heart is ventral
(b)	Post-anal tail is absent	Post-anal tail is present
(c)	Central nervous system is ventral, solid and double	Central nervous system is dorsal, hollow and single
(d)	Gill slits are present	Pharynx lack gill slits

136. How cephalochordates are different from Urochordates?

(a) Cephalochordates possess notochord throughout their life but Urochordates have it only in larval stage

(b) Cephalochordates are exclusively marine but Urochordates are also found in fresh water

(c) Cephalochordates possess dorsal nervous system but Urochordates have ventral nervous system I

(d) Cephalochordates have ventral heart but Urochordates have dorsal heart

137. How many of the following represents Urochordates (U) and Cephalochordates (C)?

Ascidia, Branchiostoma, Salpa, Doliolum

(a) U = 2, C = 2 (b) U = 1, C = 3 (c) U = 3, C = 1 (d) U = 4, C = 0

138. Match the columns:

Column – I	**Column – II**
A. *Petromyzon*	(i) Sea-horse
B. *Hippocampus*	(ii) Hag-fish
C. *Myxine*	(iii) Lamprey
D. *Exocoetus*	(iv) Flying-fish

(a) A = (i), B = (iv), C = (iii), D = (ii) (b) A = (ii), B = (iv), C = (i), D = (iii)

(c) A = (iii), B = (i), C = (iv), D = (ii) (d) A = (iii), B = (i), C = (ii), D = (iv)

139. How many of the organisms given below belong to the class Chondrichthyes (C), Osteichthyes (0) and Amphibia (A)?

Labeo, Ichthyophis, Bufo, Pterophyllum, Scoliodon, Pristis, Hippocampus, Hyla

(a) C = 3, O = 3, A = 2 (b) C = 2, O = 3, A = 3 (c) C = 1, O = 4, A = 3 (d) C = 3, O = 2, A = 3

140. Choose the correct statement for the class Osteichthyes:

(a) Are mostly oviparous and development is direct (b) Are mostly hermaphrodites

(c) Fertilization is usually internal (d) Heart is four chambered

141. Match the columns:

Column – I	***Column – II***
A. Bufo	(i) Tree – frog
B. Rana	(ii) Limbless – amphibia
C. Hyla	(iii) Frog
D. Ichthyophis	(iv) Toad

(a) A = (iv), B = (iii), C = (i), D = (ii) (b) A = (iv), B = (i), C = (iii), D = (ii)

(c) A = (ii), B = (iv), C = (i), D = (iii) (d) A = (i), B = (ii), C = (iv), D = (iii)

142. Read the following statements:

(i) Retention of larval trait is called neoteny

(ii) The largest amphibian is *Cryptobranchus*

(iii) *Seymouria* is a connecting link between amphibians and reptiles

(iv) Larva of *Ambystoma* is called axolotl

(v) Axolotls are unusal amphibians in that they reach adulthood without undergoing metamorphosis

How many of the above statements are correct?

(a) Four (b) Three (c) Five (d) Two

143. Skull is monocondylic in:

(a) Reptiles (b) Amphibians (c) Pisces (d) Both (a) and (c)

144. Read the following statements about the class Reptilia:

(i) Sexes are separate

(ii) Kidneys are metanephric

(iii) Limbs are always present and are pairs

(iv) Possess creeping or crawling mode of locomotion

(v) Represents the first true land vertebrates

Which of the above statements are correct?

(a) (i), (iii) (b) (i), (ii), (iv), (v)

(c) (i), (ii), (iii), (iv), (v) (d) (iii), (iv), (v)

145. organisms of the class Aves:

(a) Possess poor olfactory system (b) Have eyes which lack nictating membrane

(c) Are partial homeotherms (d) Lack syrinx

146. Heart is always four chambered in:

(a) Mammals (b) Aves (c) Reptiles (d) Both (a) and (b)

147. Given below are the several examples of Eutherians:

Macaca, Homo, Felis, Canis, Panthera, Balaenoptera, Delphinus, Elephas, Equus, Rattus

How many of these belong to the order carnivora (X), Primata (Y) and Cetacea (Z)?

(a) X = 3, Y = 4, Z = 3 (b) X = 3, Y = 2, Z = 2

(c) X = 4, Y = 3, Z = 3 (d) X = 2, Y = 2, Z = 3

148. Study the different organisms given below:

Ascaris, Taenia, Sycon, Spongilla, Pleurobrachia, Fasciola, Ctenoplana, Wuchereria, Planaria, Adamsia

How many of the above organisms belong to Porifera, Cnidaria, Ctenophora, Platyhelminthes and Aschelminthes?

Options	Porifera	Cnidaria	Ctenophora	Platyhelminthes	Aschelminthes
(a)	1	2	2	3	2
(b)	3	1	2	2	2
(c)	2	1	2	3	2
(d)	2	2	1	3	2

149. Match the columns

Column-I	***Column – II***
A. Malpighian tubules	(i) Sponges
B. Canal system	(ii) Leech
C. Hirudin	(iii) Insects
D. Nematocysts	(iv) Hydra

(a) A = (i), B = (iv), C = (ii), D = (iii) (b) A = (iii), B = (ii), C = (iv), D = (i)

(c) A = (iii), B = (i), C = (ii), D = (iv) (d) A = (i), B = (ii), C = (iv), D = (iii)

150. Read the following statements:

(i) Cephalopod molluscs and earthworm possess closed circulatory system

(ii) Annelids are pseudocoelomate and platyhelminths are acoelomates

(iii) The body of insects is divisible into head, thorax and abdomen

(iv) In non-chordates, if heart is present, it is dorsal

(v) Syncytial epidermis is present in *Ascaris*.

Which of the above statements are correct?

(a) (i), (ii) (b) (i), (iii), (iv), (v) (c) (iii), (iv), (v) (d) (i), (iv)

151. Which of the following is incorrect?

(a) All the elements present in a sample of earth's crust are also present in a sample of living tissue

(b) The relative abundance of carbon and hydrogen with respect to other elements is higher in any living organism than in earth's crust

(c) The % weight of nitrogen in earth's crust is very high in comparison to human body

(d) The% weight of silicon in earth's crust is very high in comparison to human body

152. Choose the correct one w.r.t. decreasing order of abundance (% weight) of elements in a cell.

(a) $C > O > N > H$ (b) $O > C > N > H$ (c) $O > N > C > H$ (d) $H > N > O > C$

153. For the chemical analysis of a tissue, it is generally ground in which acid?

(a) Trichloroacetic acid (b) Tri-iodobenzoic acid (c) Sulphuric acid (d) Acetic acid

154. Match the columns:

Column – I	*Column – II*
A. Basic amino acid	(i) Alanine
B. Acidic amino acid	(ii) Glycine
C. Neutral amino acid	(iii) Aspartic acid
	(iv) Glutamic acid
	(v) Valine
	(vi) Arginine
	(vii) Lysine
	(viii) Pheyl alanine

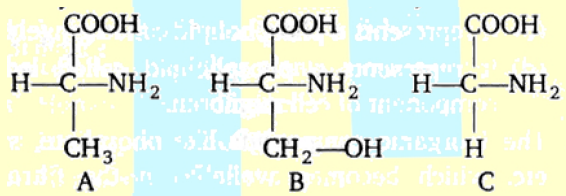
(a) $A=(i),(ii),(iii);\ B=(iv),(v);\ C=(vi),(vii),(viii)$

(b) $A=(vi),(vii),(viii);\ B=(iii),(iv);\ C=(i),(ii),(iii)$

(c) $A=(vi),(vii),(iii);\ B=(iv);\ C=(i),(ii),(v),(viii)$

(d) $A=(v),(vi),(vii);\ B=(i),(ii),(iii);\ C=(iv),(viii),(viii)$

155. Identify the amino acids marked as A, B and C:



(a) A = Alanine, B = Serine, C = Glycine (b) A = Glycine, B = Serine, C = Arginine

(c) A = Glutamic acid, B = Serine, C = Alanine (d) A = Glycine, B = Serine, C = Alanine

156. Given below are the example of few amino acids:

Glutamic acid, lysine, valine, tyrosine, phenylalanine, tryptophan.

How many of the above are aromatic amino acids?

(a) 4 (b) 2 (c) 5 (d) 3

157. Which of the following is correct?

(a) Palmitic acid has sixteen carbon atoms including carboxyl carbon

(b) Arachidonic acid has twenty carbons atoms excluding carboxyl carbon

(c) Stearic acid has eighteen carbon atoms excluding carboxyl carbon

(d) All are correct

158. A triglyceride is formed by esterification of:

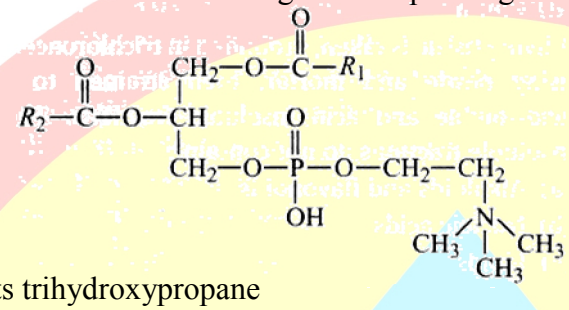
(a) One molecule of glycerol and three molecules of fatty acids

(b) One fatty acid molecule and three molecules of glycerol

(c) Three molecules of fatty acids and three molecules of glycerol

(d) None of the above

159. Observe the structural formula of organic compound given below and answer accordingly:



(a) It represents trihydroxypropane

(b) It represents cholesterol- a component of cell membrane

(c) It represents a phospholipid called gingely oil

(d) It represents a phospholipid called lecithin, a component of cell membrane

160. The inorganic compounds like phosphate, sulphate, etc. which becomes available in the filtrate after grinding the living tissue in trichloroacetic acid represents:

(a) Acid-insoluble pool (b) Acid-soluble pool (c) Water pool (d) Gaseous pool

161. The four elements which constitute upto 95% of all elements found in a living system are:

(a) C, H, P, O (b) C, N, P, O (c) C, H, O, N (d) S, O, H, C

162. Choose a saturated fatty acid:

(a) Palmitic acid (b) Linoleic acid (c) Oleic acid (d) Arachidonic acid

163. The sum total of acid soluble and acid insoluble (w.r.t grinding a living tissue in trichloroacetic acid) fraction represents the composition of:

(a) Cellular pool (b) Gene pool (c) Ecosystem (d) Non-genetic pool

164. Lipids have a molecular mass of micromolecules, i.e., less than 800 Daltons. They, however, do not appear in acid soluble pool due to their:

(a) Non-polar nature (b) Polar nature (c) Both (a) and (b) (d) None of these

165. Which one represents a triglyceride?

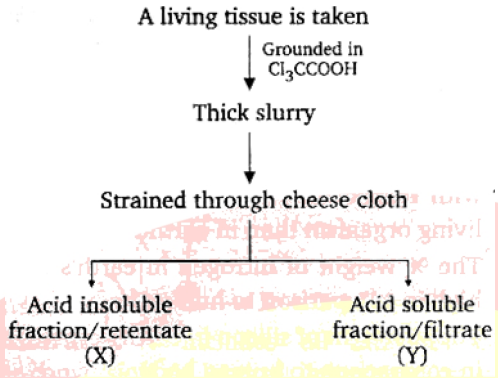
(a) Oil (b) Phospholipid (c) Polysaccharides (d) Chitin

166. A living tissue is taken, grounded in trichloroacetic acid using pestle and mortar, then strained to obtain acid-soluble and acid insoluble fractions. The acid insoluble fractions do not contain:

(a) Alkaloids and flavonoids (b) Nucleic acids

(c) Lipids (d) Polysaccharides

167. Study the flow chart given below and identify X and Y according to the statements (i-v) provided.



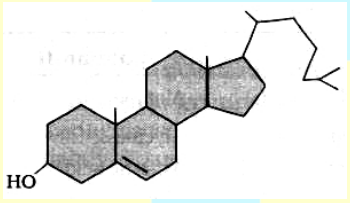
(i) Monomers are present (ii) Polymers are abundant

(iii) Molecular weight more than 800 Daltons (iv) Molecular weight between 18-800 Daltons

(v) Amino acids, nucleotides monosaccharides

	X	***Y***
(a)	(ii), (iii)	(i), (iv), (v)
(b)	(i), (ii)	(iii),(.iv), (v)
(c)	(ii), (iii), (iv)	(i), (v)
(d)	(i), (iv), (v)	(ii), (vi)

168. Which of the following is correct for the compounds A and B?



(A)

$CH_3—(CH_2)_{14}—COOH$

(B)

(a) A = Precursor for biosynthesis of steroid hormone, B = It is palmitic acid

(b) A = Sterol, B = Unsaturated fatty acid

(c) A = Benzene derivative, B = Major component of palm oil

(d) A = Most abundant steroid in animal tissue, B = Stearic acid

169. Reducing sugars are sugars which can reduce Cu^{2+} into Cu^{2+}. Which of the following represents non-educing sugar?

(a) Maltose (b) Sucrose (c) Glucose (d) Fructose

170. In a polysaccharide chain like glycogen, the right end is called the reducing end since:

(a) —CHO group is engaged in glycosidic linkage

(b) —CHO group is free

(c) —CH_3 group is engaged in glycosidic linkage

(d) —CH_3 group may be free

171. Read the following statements:

(i) Chitin, starch, glycogen and agar-agar are homopolymers

(ii) In a glycogen, the left end is called the non-reducing end

(iii) Starch forms helical secondary structures but cellulose does not contain complex helices

(iv) Cellulose can easily hold iodine

(v) Chitin is a storage polysaccharide

How many of the above statements are correct?

(a) Two (b) Three (c) Four (d) Five

172. Choose the incorrect option:

(a) Inulin is a heteropolysaccharide

(b) Cellulose gives no colour with iodine solution

(c) Starch gives blue colour and glycogen gives red colour with iodine solution

(d) Inulin is a homopolymer of fructose

173. In a glycogen molecule, successive glucose units are joined together by X and branches are linked together by Y. Identify X and Y.

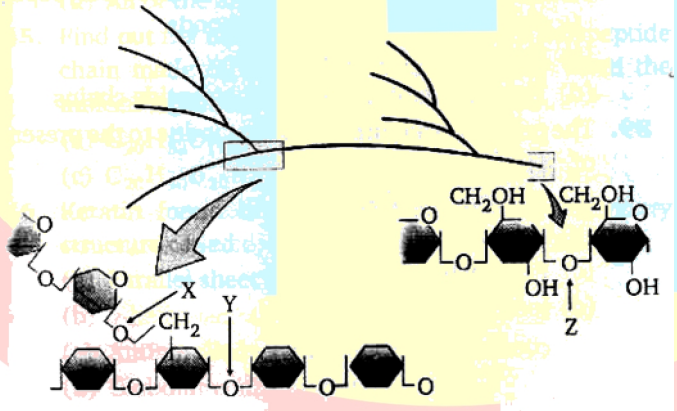
(a) X = 1, 6-α -glycosidic bonds, Y= 1, 6-α -glycosidic bonds

(b) X = 1, 6-α -glycosidic bonds, Y= 1, 4-α -glycosidic bonds

(c) X = 1, 4-α -glycosidic bonds, Y= 1, 6-α -glycosidic bonds

(d) X = 1, 4-α -glycosidic bonds, Y= 1, 4-α -glycosidic bonds

174. Identify the linkages X, Y and Z in the diagram



(a) X = α -1, 6; Y = α -1,4 ; Z = α -1, 4 (b) X = β -1, 6 ; Y = β -1, 4 ; Z = β -1, 4

(c) X = α -1, 6; Y = β -1, 4; Z = α -1, 4 (d) X = β -1, 6; Y = α -1, 4; Z = β -1, 4

175. The cell wall of higher plants is made of

(a) Homopolymer of glucose (b) Heteropolymer of glycogen

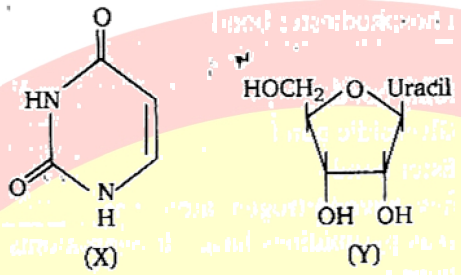
(c) Homopolymer of glycogen (d) Homopolymer of galactose

176. How many of compounds given below represent nucleosides (X) and nucleotides (Y).

Adenylic acid, cytidine, AMP, dCTP, Guanosine, dAMP

(a) X = 4, Y = 2 (b) X = 3, Y = 3 (c) X = 2, Y = 4 (d) X = 1, Y = 5

177. What does X and Y represent in the structures given below?



(a) X = Uridylic acid, Y = Uridine (b) X = Uridine, Y = Uridylic acid

(c) X = Uridine, Y = Uracil (d) X = Uracil, Y = Uridine

178. Observe the reaction flow given below:

(i) Guanine + X = Guanosine

(ii)Guanosine + Y = Guanylate (or GMP) Identify X and Y

(a) X = Sugar, Y = Phosphate group (b) X = Pentose sugar, Y = Phosphate group

(c) X = Ribose sugar, Y = Phosphate group (d) X = Deoxyribose sugar, Y = Phosphate group

179. In a DNA molecule, the phosphate group is attached to _____ carbon of the sugar residue of its own nucleotide and _____carbon of the sugar residue of the next nucleotide by bonds:

(a) 3', 5', glycosidic (b) 5', 3', phosphodiester

(c) 3', 5', phosphodiester (d) 5', 3', glycosidic

180. A segment of dsDNA has 120 adenine and 120 cytosine bases. The total number of nucleotides present in the segment is:

(a) 120 (b) 480 (c) 60 (d) 240

ANSWER

PHYSICS									
1	2	3	4	5	6	7	8	9	10
C	**C**	**B**	**C**	**C**	**C**	**B**	**D**	**C**	**D**
11	12	13	14	15	16	17	18	19	20
A	**C**	**C**	**A**	**C**	**B**	**A**	**B**	**B**	**C**
21	22	23	24	25	26	27	28	29	30
A	**B**	**C**	**A**	**B**	**A**	**C**	**B**	**C**	**A**
31	32	33	34	35	36	37	38	39	40
B	**B**	**A**	**C**	**C**	**A**	**C**	**A**	**B**	**A**
41	42	43	44	45					
B	**A**	**C**	**A**	**A**					
CHEMISTRY									
46	47	48	49	50	51	52	53	54	55
A	**B**	**A**	**C**	**D**	**B**	**B**	**D**	**B**	**D**
56	57	58	59	60	61	62	63	64	65
A	**D**	**D**	**B**	**C**	**C**	**A**	**C**	**B**	**B**
66	67	68	69	70	71	72	73	74	75
D	**C**	**A**	**C**	**D**	**A**	**A**	**B**	**D**	**A**
76	77	78	79	80	81	82	83	84	85
B	**A**	**B**	**A**	**B**	**C**	**D**	**C**	**C**	**D**
86	87	88	89	90					
A	**B**	**A**	**A**	**D**					
BIOLOGY									
91	92	93	94	95	96	97	98	99	100
D	**D**	**A**	**D**	**A**	**D**	**A**	**D**	**D**	**D**
101	102	103	104	105	106	107	108	109	110
C	**D**	**D**	**A**	**B**	**A**	**A**	**B**	**C**	**D**
111	112	113	114	115	116	117	118	119	120
B	**B**	**C**	**C**	**A**	**D**	**C**	**A**	**A**	**A**
121	122	123	124	125	126	127	128	129	130
A	**A**	**B**	**B**	**D**	**A**	**B**	**C**	**A**	**D**
131	132	133	134	135	136	137	138	139	140
A	**A**	**A**	**A**	**D**	**A**	**C**	**D**	**B**	**A**
141	142	143	144	145	146	147	148	149	150
A	**C**	**D**	**B**	**A**	**D**	**B**	**C**	**C**	**B**
151	152	153	154	155	156	157	158	159	160
C	**B**	**A**	**C**	**A**	**D**	**A**	**A**	**D**	**B**
161	162	163	164	165	166	167	168	169	170
C	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**B**	**B**
171	172	173	174	175	176	177	178	179	180
A	**A**	**C**	**A**	**A**	**C**	**D**	**C**	**B**	**B**