1. An object is dragged along a horizontal surface by the machine which delivers a constant power. How does the distance moved by the object is dependent on time t?

(1) $t^{3/4}$ (2) $t^{3/2}$

(3) $t^{1/4}$ (4) $t^{1/2}$

2. A body is thrown up in a lift with a velocity 5m/s relative to the lift and the time of flight is found to be 0.8 s. The acceleration with which the lift is moving up is = 10 m s^{-2})

(1) 1.5m s^{-2} (2) 2m s^{-2}

(3) 2.5 m s^{-2} (4) 3m s^{-2}

3. A packet of weight w is dropped with the help of a parachute and on striking the ground comes to rest with retardation equal to twice the acceleration due to gravity. The force exerted on the ground is

(1) w (2) 2w

(3) 3w (4) 4w

4. The equation of a wave on a string of linear mass density 0.04 kgm^{-1} is given by, $y = 0.02(m)\left\{2\pi\left(\frac{t}{0.04(s)} - \frac{x}{0.50(m)}\right)\right\}$ tension in the string is

(1) 4.0N (2) 12.5N

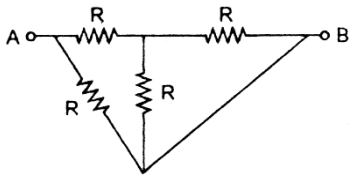
(3) 25N (4) 6.25N

5. On which principle does Sonometer work?

(1) Hook`s law (2) Elasticity

(3) Resonance (4) Newton`s law

6. The equivalent resistance between points A and B is



(1) $\frac{4}{5}R$ (2) $\frac{3}{4}R$

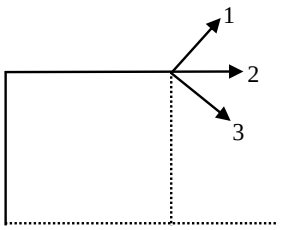
(3) $\frac{4}{3}R$ (4) 2R

7. A projectile is projected from the ground by making an angle of 60º with the horizontal. After 1 s projectile makes an angle of 30º with the horizontal. The maximum height attained by the projectile is (Take g = 10 m s^{-2})

(1) $\frac{45}{2}$m (2) $\frac{45}{4}$m

(3) $\frac{43}{2}$m (4) $\frac{43}{4}$m

8. Three balls are projected from the top of a building with equal speeds but at different angles. Balls strike the ground with velocities v_1, v_2 and v_3 respectively, then



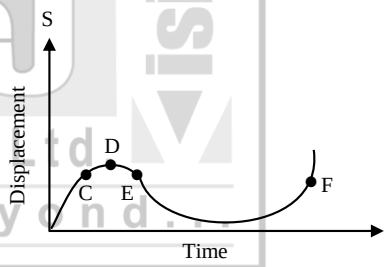
(1) $v_1 > v_2 > v_3$

(2) $v_3 > v_2 > v_1$

(3) $v_1 = v_2 = v_3$

(4) $v_2 < v_3 < v_1$

9. The displacement time graph of a moving particle is shown below the instantaneous velocity of the particle is negative at the point



(1) C (2) E

(3) D (4) F

10. A stone is thrown at 25m/s at 53º above the horizontal. At what time its velocity is at 45º below the horizontal?

(1) 0.5s (2) 4s

(3) 3.5 s (4) 2.5 s

11. Which of the following statement is not true

(1) The coefficient of friction between two surfaces increases as the surface in contact are made rough

(2) The force of friction acts in the direction opposite to the applied force

(3) Rolling friction is greater than sliding friction

(4) The coefficient of friction between wood and wood is less than 1

12. If a bullet of mass 5 g moving with velocity 100 m/s, penetrates the wooden block up to 6 cm. then the average force imposed by the bullet on the block is

(1) 8300 N (2) 417 N

(3) 830 N (4) Zero

13. If a ball is thrown vertically upwards with a velocity of 40 m/s. then velocity of the ball after two second will be. ($g = 10\ m/s^2$)

(1) 15 m/s (2) 20 m/s

(3) 25 m/s (4) 28 m/s

14. A, B, C and D are four different physical quantities having different dimensions. None of them is dimensionless. But we know that the equation AD = C ln(BD) holds true. Then which of the combination is not a meaningful quantity?

(1) $\frac{C}{BD}-\frac{A^2D^2}{C}$ (2) $A^2-B^2C^2$

(3) $\frac{A}{B}-C$ (4) $\frac{A^2-AC}{D}$

15. A particle undergoes uniform circular motion. About which point on the plane of the circle will the angular momentum of the particle remain conserved?

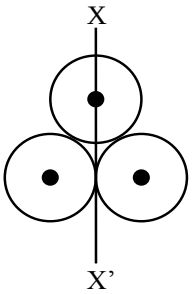
(1) Center of the circle

(2) On the circumference of the circle

(3) Inside the circle

(4) Outside the circle

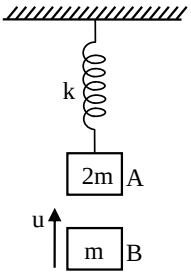
16. Three identical spherical shells, each of mass m and radius r are placed as shown in the figure. Consider an axis XX' which is touching the two shells and passing through diameter of the third shell. Moment of inertia of the system consisting of these three spherical shells about XX' axis is



(1) $\frac{11}{5}mr^2$ (2) mr^2

(3) $\frac{16}{5}mr^2$ (4) $4\ mr^2$

17. A block A of mass 2m is hanging from a vertical mass less spring of spring constant k and is in equilibrium. Another block B of mass m strikes the block A with velocity u and sticks to it as shown in the figure. The magnitude of the acceleration of the combined system of the block just after the collision is



(1) g/2 (2) g/3

(3) g (4) zero

18. Mass is non-uniformly distributed over the rod of length l. Its linear mass density varies linearly with length as $\lambda = kx^2$. The position of center of mass (from lighter end) is given by

(1) 2l/5 (2) 3l/5

(3) 3l/4 (4) 2l/3

19. A charge q moving with velocity v, enters a uniform magnetic field. The charge keeps on revolving along a closed circular path in the magnetic field. The frequency of revolution does not depend upon

(1) Mass of the charge particle

(2) Velocity of the charge particle

(3) Magnitude of charge particle

(4) Intensity of the magnetic field

20. In a series L-R circuit, under which condition the power loss will be least for an a.c voltage source?

(1) High resistance and high inductance

(2) High resistance and low inductance

(3) Low resistance and high inductance

(4) Low resistance and low inductance

21. A charged capacitor C = 30 μF is connected to an inductor L = 27 mH, then the angular frequency of the system is

(1) 9.1×10^3 rad s^{-1}

(2) 3×10^3 rad s^{-1}

(3) 1.1×10^3 rad s^{-1}

(4) 0.3×10^3 rad s^{-1}

22. **Statement (I)** : A body can have acceleration even if its velocity is zero at a given instant of time.

Statement (II) : A body is momentarily at rest when it reverses its direction of motion.

(1) Statement I is incorrect but statement II is correct

(2) Both Statements I and II are correct

(3) Both Statements I and II are incorrect

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

23. In Young's double slit experiment, the intensities at two points P_1 and P_2 on the screen are I_1 and I_2 respectively. If P_1 is located at the central bright fringe and P_2 is located at a distance equal to quarter of fringe width from P_1, then $\frac{I_1}{I_2}$ is:

(1) 2 (2) $\frac{1}{2}$

(3) 4 (4) 16

24. An electron is in excited state in hydrogen like atom. It has a total energy of –3.4 eV. The kinetic energy is E and its de Broglie wavelength is λ. Then,

(1) E = 6.8 eV, $\lambda = 6.6 \times 10^{-10}$ m

(2) E = 3.4 eV, $\lambda = 6.6 \times 10^{-10}$ m

(3) E = 3.4 eV, $\lambda = 6.6 \times 10^{-11}$ m

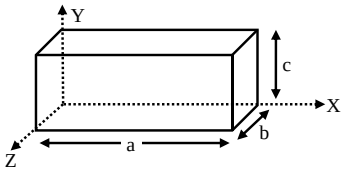
(4) E = 6.8 eV, $\lambda = 6.6 \times 10^{-11}$ m

25. The isothermal elasticity of a gas is equal to

(1) Density (2) Volume

(3) Pressure (4) Specific heat

26. A solid metallic cuboid of homogeneous material having geometrical dimension as shown in the figure will have a ratio of resistances for the sense of current along x, y and z directions respectively, equal to



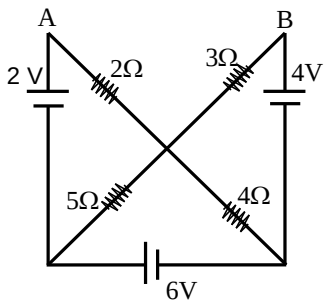
(1) a: b: c

(2) a: c: b

(3) $a^2 : b^2 : c^2$

(4) $a^2 : c^2 : b^2$

27. Potential difference between points A and B (i.e. $V_A – V_B$) is: -



(1) 2V (2) 4V

(3) 6V (4) 8V

28. 1000 small water drops each of radius r and charge q coalesce together to form one spherical drop. The potential of the bigger drop is larger than that of the smaller one by a factor

(1) 1000 (2) 100

(3) 10 (4) 1

29. Two spheres of radii 2 cm and 3 cm are charged to same potential. If σ_1 & σ_2 be respectively the values of surface charge density on the conductors, then the ratio $\frac{\sigma_1}{\sigma_2}$ will be

(1) $\frac{4}{9}$ (2) $\frac{2}{3}$

(3) $\frac{3}{2}$ (4) $\frac{9}{4}$

30. A positive charge q is given to each plate of a parallel plate air capacitor having plate area A and plate separation d, then

(1) Since both the plates are identically charged, therefore, capacitance becomes equal to zero

(2) Energy stored to in the space between the capacitor plate is equal to $\frac{q^2}{\varepsilon_0 A^2}$

(3) No charge appears on the inner surface of the plates

(4) Potential difference between the plates is equal to $\frac{2qd}{\varepsilon_0 A}$

31. An electromagnetic wave of frequency 1×10^{14} hertz is propagating along z–axis. The amplitude of electric field is 4V/m. If $\in_0 = 8.8 \times 10^{-12}$ $C^2/N–m^2$, then average energy density of electric field will be:

(1) 35.2×10^{-11} J/m^3

(2) 35.2×10^{-12} J/m^3

(3) 35.2×10^{-13} J/m^3

(4) 35.2×10^{-10} J/m^3

32. A particle starts oscillating simple harmonically from its equilibrium position with time period T. The ratio of KE and PE of the particle at the $t = \frac{T}{12}$ is

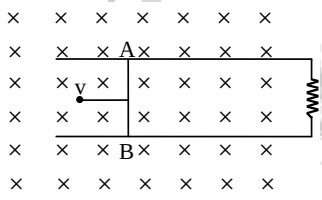
(1) 1:4

(2) 2:1

(3) 3:1

(4) 4:1

33. Consider the situation shown in the figure. The wire AB is sliding on the fixed rails with constant velocity v. If the wire AB is replaced by a semicircular wire, the magnitude of the induced current will-



(1) Increase

(2) Remain the same

(3) Decrease

(4) Increase or decrease depending on whether the semicircle bulges towards the resistance or away from it

34. The magnetic flux through a coil varies with time as $\phi = 5t^2 – 6t + 9$. The ratio of EMF at t = 0 s to t = 0.5s will be

(1) 9:1 (2) 1:6

(3) 6:1 (4) 1:9

35. A particle is moving in a circular path of radius a under the action of an attractive potential $U = -\frac{k}{2r^2}$. Its total energy is :

(1) zero (2) $-\frac{3}{2}\frac{k}{a^2}$

(3) $-\frac{k}{4a^2}$ (4) $\frac{k}{2a^2}$

36. A particle is moving eastwards with a velocity of 5 ms^{-1}. In 10 second the velocity changes to 5 ms^{-1} northwards. The average acceleration in this time is :

(1) $\frac{1}{\sqrt{2}}$ ms^{-2} towards north-west

(2) $\frac{1}{2}$ ms^{-2} towards north

(3) zero

(4) $\frac{1}{2}$ ms^{-2} towards north-west.

37. An ideal gas undergoes a quasi static, reversible process in which its molar heat capacity C remains constant. If during this process the relation of pressure P and volume V is given by PV^n = constant, then n is given by (Here Cp and C_V are molar specific heat at constant pressure and constant volume, respectively) :

(1) $n = \frac{C - C_p}{C - C_V}$ (2) $n = \frac{C_p - C}{C - C_V}$

(3) $n = \frac{C - C_V}{C - C_p}$ (4) $n = \frac{C_p}{C_V}$

38. A circular loop of radius 0.3cm lies parallel to a much bigger circular loop of radius 20cm. The centre of the small loop is on the axis of the bigger loop. The distance between their centres is 15cm. If a current of 2.0 A flows through the smaller loop, then the flux linked with bigger loop is :

(1) 9.1×10^{-11} weber

(2) 6×10^{-13} weber

(3) 3.3×10^{-20} weber

(4) 6.6×10^{-9} weber

39. The threshold frequency for a metallic surface corresponds to an energy of 6.2 eV, and the stopping potential for a radiation incident on this surface is 5V. The incident radiation lies in

(1) X-ray region (2) ultra-violet region

(3) infra-red region (4) visible region

40. Which of the following cannot be polarized?

(1) Ultrasonic waves

(2) Radio waves

(3) Ultraviolet rays

(4) X- rays

41. **Statement (I)**: All oscillatory motions are necessarily periodic motion but all periodic motion are not oscillatory.

Statement (II) : Simple pendulum is an example of oscillatory motion.

(1) Statement I is incorrect but statement II is correct

(2) Both Statements I and II are correct

(3) Both Statements I and II are incorrect

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

42. A wheel of radius 1 meter rolls forward half a revolution on a horizontal ground. The magnitude of the displacement of the point of the wheel initially in contact with the ground is

(1) 2π (2) $\sqrt{2}\pi$

(3) $\sqrt{\pi^2+4}$ (4) π

43. The force required to separate two glass plates of area $10^{-2}m^2$ with a film of water 0.05 *mm* thick between them, is (Surface tension of water is 70×10^{-3} *N*/*m*)

(1) 28 *N* (2) 14 *N*

(3) 50 *N* (4) 38 *N*

44. **Statement I:** Electromagnetic waves interact with matter and set up oscillations.

Statement II: Interaction is independent of the wavelength of the electromagnetic wave.

(1) Statement I is incorrect but statement II is correct

(2) Both Statements I and II are correct

(3) Both Statements I and II are incorrect

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

45. A particle at end of a spring executes simple harmonic motion with a period t_1, while the corresponding period of another spring is t_2. If two springs are connected in series then time period is T, them which one is true? (Consider same mass of particle in all cases)

(1) $T = t_1 + t_2$

(2) $T^2 = t_1^2 + t_2^2$

(3) $T = t_1^{-1} + t_2^{-1}$

(4) $T = t_1^{-2} + t_2^{-2}$

46. Total number of spectral lines produced in H-spectrum when electronic transition occur between 6 excited state to ground state is :-

(1) 15 (2) 21

(3) 10 (4) 42

47. Consider the following reaction

$N_2O_4(g) \rightleftharpoons 2NO_2(g)$; $\Delta H° = +58$ kJ

For each of the following cases (a, b), the direction in which the equilibrium shifts is?

(a) Temperature is decreased

(b) Total Pressure is increased by adding Ne(g) at constant volume.

(1) (a) towards reactant, (b) no shift

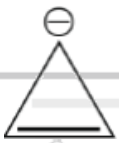
(2) (a) towards product, (b) towards reactant

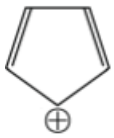
(3) (a) towards product, (b) no shift

(4) (a) towards reactant, (b) towards product

48. Which of the following is aromatic species?

(1) 

(2) 

(3) 

(4) 

49. For the reaction $2NH_3 \rightarrow N_2 + 3H_2$, if

$$-\frac{d[NH_3]}{dt} = k_1[NH_3], \frac{d[N_2]}{dt} = k_2[NH_3],$$

$$\frac{d[H_2]}{dt} = k_3[NH_3]$$

Then the relation between k_1, k_2 and k_3 is:

(1) $k_1 = k_2 = k_3$

(2) $k_1 = 3k_2 = 2k_3$

(3) $1.5k_1 = 3k_2 = k_3$

(4) $2k_1 = k_2 = 3k_3$

50. **Assertion:** First man made element of lanthanoid is Pm.

Reason: f – block elements lies in IV B.

(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

51. Equal masses of O_2 and N_2 are reacted according to the equation: $O_2 + N_2 \rightarrow 2NO$. Which statement is true?

(1) O_2 is the limiting reagent and N_2 is present in excess

(2) N_2 is the limiting reagent and O_2 is present in excess.

(3) O_2 and N_2 react with each other and neither is in excess.

(4) Nothing can be said about the limiting reagent

52. The equivalent weight of oxidant in the unbalanced equation $MnO_4^- + Fe^{+2} \rightarrow Mn^{+2} + Fe^{+3}$ is:

(1) M/1 (2) M/5

(3) 6M/5 (4) 2M/5

53. Match List-I with List-II:

List – I		List – II	
A	Raoult's law	I	$\Delta T_f = K_f m$
B	Osmotic pressure	II	$P_A = P_A° X_A$
C	Elevation in boiling point	III	$\pi = CRT$
D	Depression in freezing point	IV	$\Delta T_b = K_b m$

Choose the correct answer from the options given below:

(1) (A–II), (B–III), (C–IV), (D–I)

(2) (A–III), (B–II), (C–IV), (D–I)

(3) (A–II), (B–III), (C–I), (D–IV)

(4) (A–IV), (B–I), (C–II), (D–III)

54. Number of moles of MnO_4^- required to oxidize one mole of ferrous oxalate completely in acidic medium will be:-

(1) 7.5 moles

(2) 0.2 moles

(3) 0.6 moles

(4) 0.4 moles

55. Consider the following reactions:

$C(s) + O_2(g) \rightarrow CO_2(g) + x$ kJ

$$CO(g) + \frac{1}{2}O_2(g) \rightarrow CO_2(g) + y\ kJ$$

The heat of formation of CO(g) is :

(1) –(x+y) kJ/mol

(2) (x–y) kJ/mol

(3) (y–x) kJ/mol

(4) (x + y) kJ/mol

56. Which of the following order is incorrect?

(1) The decreasing order of bond angle is $H_2O > H_2S > H_2Se > H_2Te$

(2) The increasing order of bond length (E-H) is $NH_3 < PH_3 < AsH_3 < SbH_3$

(3) The decreasing order of bond dissociation energy is $Cl_2 > F_2 > Br_2 > I_2$

(4) The decreasing order of bond angle is $CH_4 > NH_3 > H_2O$

57. **Assertion:** Lattice energy of MgF_2 is more than NaF.

Reason: MgF_2 is more ionic than NaF.

(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

58. Which of the following represents correct order of acidic strength

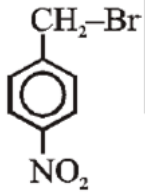
(1) $NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$

(2) $K_2O > ZnO > NO_2$

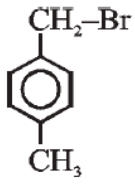
(3) NaOH < KOH < RbOH < CsOH

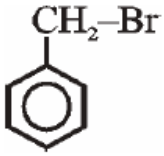
(4) $CH_4 < NH_3 < H_2O < HF$

59. Which is most reactive for SN^1 reaction?

(1) 

(2) 

(3) 

(4) 

60. Which ions having $4f^{14}5d^06s^0$ outer electronic configuration:

(1) Yb^{2+} (2) Lu^{3+}

(3) Yb^{3+} (4) Both (1) and (2)

61. Which of the following has sp^3 hybridisation:

(1) $[NI(CN)_4]^{-2}$

(2) $[PtCl_4]^{-2}$

(3) $[AgF_4]^-$

(4) $[CuCl_4]^{-2}$

62. Consider the following salts. Which one(s) of salts when dissolved in water will produce a basic solution?

I. NH_4Cl II. $KHSO_4$

III. NaCN IV. KNO_3

(1) II and III (2) I and II

(3) Only III (4) II and IV

63. A, B, C, D are four liquids having boiling point as 40°C, 90°C, 100°C, 150°C respectively. Which will have highest vapour pressure at same temperature?

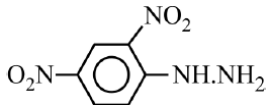
(1) D (2) C

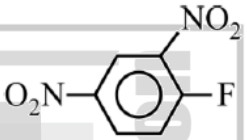
(3) B (4) A

64. Brady's reagent is

(1) $[Cu(NH_3)_4]SO_4$

(2) $KMnO_4/NaIO_4$

(3) 

(4) 

65. Total no. of e^- in e_g orbitals of Mn for complex $[MnO_4]^-$:

(1) 3 (2) 4

(3) Zero (4) 7

66. Which of the following represent incorrect similarity b/w S & Cr?

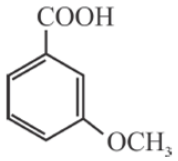
(1) Both exhibit hexavalency

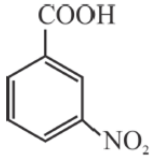
(2) Sulphate & chromate of Ba^{+2} are water insoluble

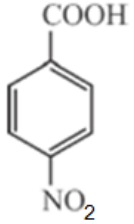
(3) Trioxide (MO_3) both are acidic

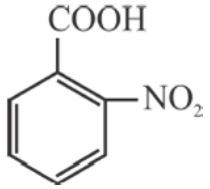
(4) Sulphate & chromate of Ba^{+2} show's same colour

67. Which of the following is strongest acid.

(1) 

(2) 

(3) 

(4) 

68. Identify the strongest oxidising ion:

(1) Fe^{+2} (2) Cr^{+3}

(3) Mn^{+3} (4) Mn^{+2}

69. Which of the following phosphorus is the most reactive?

(1) Scarlet phosphorus

(2) White phosphorus

(3) Red phosphorus

(4) Violet phosphorus

70. Which do not give chromyl chloride test.

(1) $CaCl_2$ (2) Hg_2Cl_2

(3) $ZnCl_2$ (4) $C_6H_5NH_3+Cl^-$

71. **Statement-I: -** Carboxylic acids are reduced to 2° alcohols by $LiAlH_4$ or B_2H_6

Statement-II:- Carboxylic acids having an α - hydrogen can give HVZ reaction.

(1) Both Statement I and Statement II are incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct.

72. $CH_3-CH_2-OH \xrightarrow[\Delta]{H-Br} A \xrightarrow{KCN} B \xrightarrow[(ii)\,H_2O]{(i)\,DIBAL-H} C$

Incorrect statement about C is -

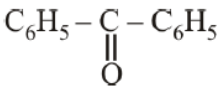
(1) It reduces Fehling solution.

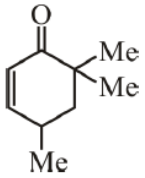
(2) It does not give haloform reaction.

(3) It gives positive test with 2,4-DNP

(4) It undergoes Cannizzaro's reaction.

73. Which of the following shows tautomerism?

(1) 

(2) 

(3) $C_6H_5–NO_2$

(4) $(CH_3)_2C–CHO$

74. Correct order of oxidising strength is:

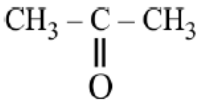
(1) $HClO_4 > HClO_3 > HClO_2 > HOCl$

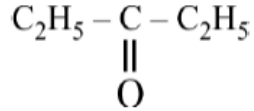
(2) $HOCl > HClO_2 > HClO_3 > HClO_4$

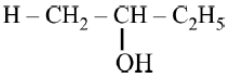
(3) $HOCl_2 > HOCl > HClO_3 > HClO_4$

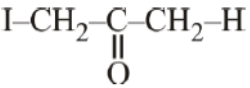
(4) $HClO_3 > HClO_4 > HOCl > HClO_2$

75. Which of the following will not give iodoform test

(1) 

(2) 

(3) 

(4) 

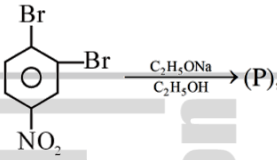
76. Enthalpy of neutralization of oxalic acid ($H_2C_2O_4$) with NaOH at 25°C & 1 bar is –10.7 kcal equivalent^{-1}. What will be its enthalpy of ionisation.

(1) 3 kcal mol^{-1}

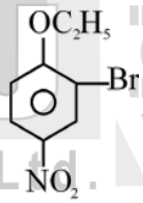
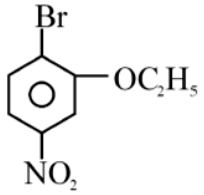
(2) 6 kcal mol^{-1}

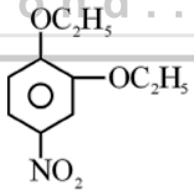
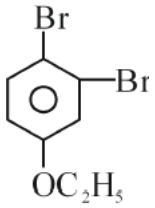
(3) 2 kcal mol^{-1}

(4) 9 kcal mol^{-1}

77.  (P),

Product (P) is :

(1)  (2) 

(3)  (4) 

78. Match the columns:

Column –I (Vitamin)		Column – II (Disease)	
P	Vitamin – B_{12}	a	Increased blood clotting time
Q	Vitamin - K	b	Pernicious anaemia
R	Vitamin - E	c	Muscular Weakness
S	Vitamin - D	d	Rickets

(1) (P) - a, (Q) - b, (R) - c, (S) - d

(2) (P) - b, (Q) - a, (R) - c, (S) - d

(3) (P) - b, (Q) - a, (R) - d, (S) - c

(4) (P) - d, (Q) - c, (R) - b, (S) - a

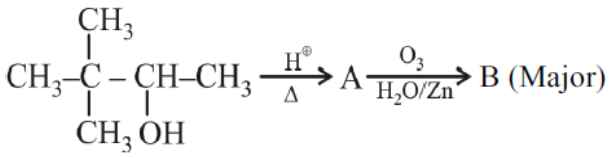
79. Which conformer of ethane have maximum torsional strain:-

(1) Staggered form

(2) Eclipsed form

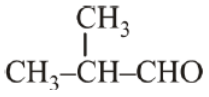
(3) Skew form

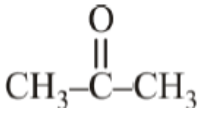
(4) All have same

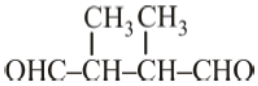
80. 

Compound B is :

(1) $CH_3 - CHO$

(2) 

(3) 

(4) 

81. The specific conductance of a 0.1 N KCl solution at 23°C is 0.012 ohm^{-1} cm^{-1}. The resistance of cell containing the solution at the same temperature was found to be 55 ohm. The cell constant will be:

(1) 0.142 cm^{-1}

(2) 0.66 cm^{-1}

(3) 0.918 cm^{-1}

(4) 1.12 cm^{-1}

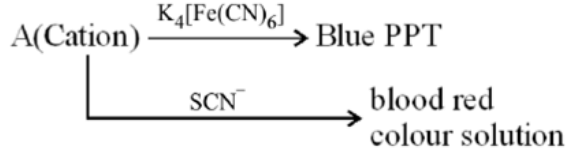
82. Covalent character is maximum with-

(1) Large cation and small anion

(2) Small cation and small anion

(3) Small cation and large anion

(4) Large cation and large anion

83. 

(A) is.

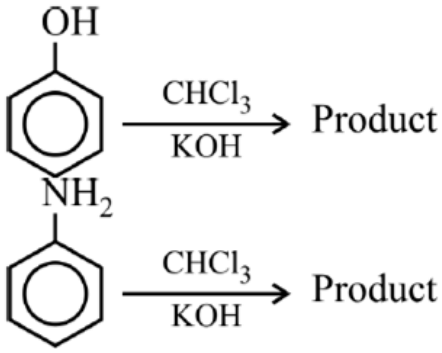
(1) Fe^{+2} (2) Zn^{+2}

(3) Fe^{+3} (4) Ni^{+2}

84. For the reaction, $X_2O_4(\ell) \rightarrow 2XO_2(g)$ ΔU = 2.1 kcal, ΔS = 20 cal K^{-1} at 300 K hence, ΔG is:

(1) 9.3 kcal (2) –9.3 kcal

(3) 2.7 kcal (4) –2.7 kcal

85. 

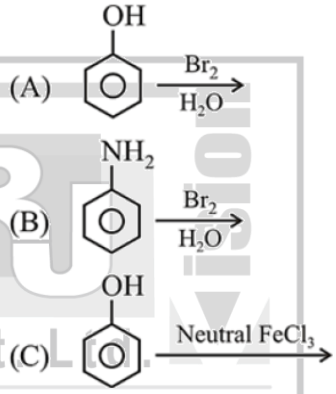
Find the correct statement regarding both reaction:

(1) Both reaction are electrophilic addition reaction

(2) Both reaction are called Reimer – Tiemann reaction.

(3) Both reaction involves formation of dichlorocarbene (singlet form)

(4) Each reaction product have two different functional group.

86. 

In which of the following reaction product is white precipitate:

(1) Only (A)

(2) Only (B)

(3) Only (C)

(4) (A) and (B) both

87. **Assertion:** The ionization constants of weak diprotic acid are in the order of $K_{a1} > K_{a2}$.

Reason: Removal of H^+ from anion is difficult as compare to neutral molecule.

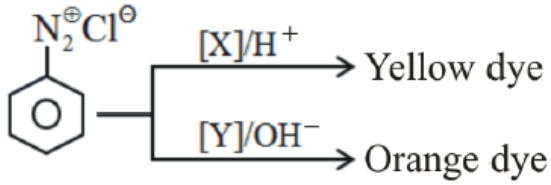
(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(2) (A) is correct but (R) is not correct

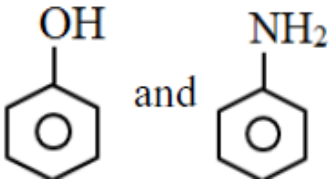
(3) (A) is not correct but (R) is correct

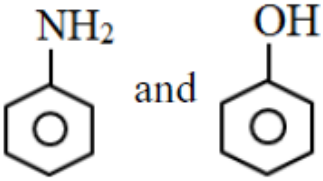
(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

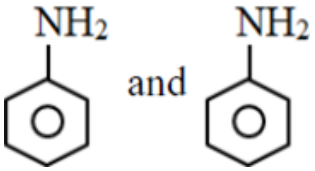
88.

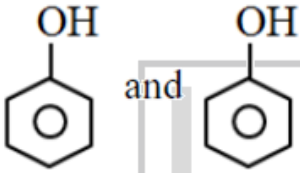


X and Y are -

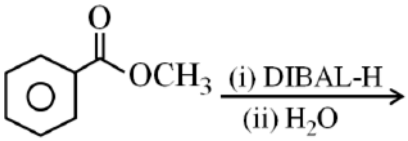
(1) 

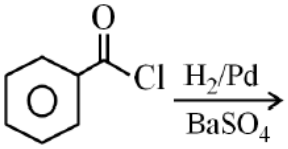
(2) 

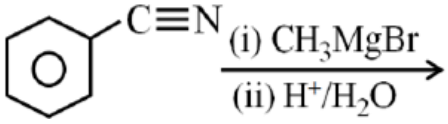
(3) 

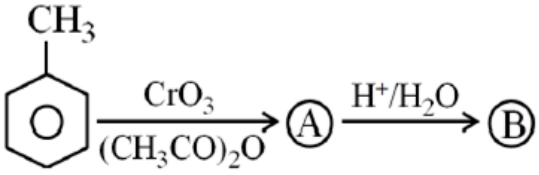
(4) 

89. The incorrect method to synthesize benzaldehyde is

(1) 

(2) 

(3) 

(4) 

90. Fourth electron of Be atom have four quantum numbers :-

(1) n=1, l=0, m=0, $s = +\frac{1}{2}$

(2) n=1, l=1, m=+1, $s = +\frac{1}{2}$

(3) n=2, l=0, m=0, $s = -\frac{1}{2}$

(4) n=2, l=1, m=0, $s = +\frac{1}{2}$

91. Which of the following is true for sexual reproduction in flowering plant?

(A) Double fertilization
(B) Triple fusion
(C) Zooidogamy
(D) Siphonogamy
(E) Haploid endosperm
(F) Triploid endosperm

(1) A, B, C and F only (2) A, B, D and F only
(3) A and D only (4) A, B, D, E and F

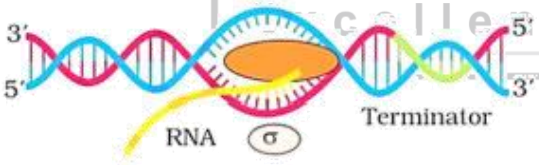
92. Select the incorrect statement w.r.t. binomial nomenclature.

(1) Biological names are generally in Latin and written in italics.
(2) The first word in a biological name represents the genus.
(3) Both the words in a biological name when handwritten are separately underlined.
(4) The first word starts with a small latter.

93. Ethanolic fermentation differs from lactic acid fermentation as former involves

(1) Incomplete oxidation of glucose
(2) Release of CO_2
(3) Production of 2 ATP
(4) Production of harmful end products

94. The below figure represents



(1) Chain termination during transcription
(2) Chain initiation during transcription
(3) Chain elongation during transcription
(4) Binding of σ factor with promoter sequence on DNA

95. All are features of xylem fibres, except:

(1) Highly thickened cell walls
(2) Septate or aseptate
(3) Obliterated central lumen
(4) Non-lignified cell wall

96. Starch sheath is present in

(1) Dicot stem (2) Dicot root
(3) Monocot stem (4) Monocot root

97. Which of the following is not given any place in ecological pyramids?

(1) Producers (2) Carnivores
(3) Herbivores (4) Decomposers

98. Glomus is associated with:

(1) Intergrated pest management
(2) Availing water and phosphorus for plants
(3) Non-leguminous symbiotic nitrogen fixation
(4) Biofortificaton

99. Select the option representing the correct sequence of following events occurring in mitosis:

a. Disappearance of golgi complex, ER, nuclear membrane and nucleolus.
b. Spindle fibres attach to the kinetochore.
c. Chromatid moves to the opposite poles.
d. Decondensation of chromosomes.

(1) $d \rightarrow c \rightarrow b \rightarrow a$
(2) $d \rightarrow a \rightarrow c \rightarrow b$
(3) $b \rightarrow c \rightarrow a \rightarrow d$
(4) $a \rightarrow b \rightarrow c \rightarrow d$

100. Which of the following organisms and trophic levels is mismatched?

(1) Algae– producer
(2) Phytoplankton – primary consumer
(3) Fungi – decomposer
(4) Frog – secondary consumer

101. Match column-I with column-II w.r.t. evolution of man and select the correct option.

Column – I	Column – II
a. *Homo erectus*	i. Not taller than 4 feet
b. *Australopithecines*	ii. Fossils discovered in Java in 1891
c. *Ramapithecus*	iii. Lived in near east and central Asia
d. Neanderthal man	iv. Existed about 15 mya

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

102. Duplication of mitochondria and chloroplast takes place in

(1) G_1 phase (2) G_0 phase
(3) G_2 phase (4) S phase

103. An event precursor to seed habit is firstly observed in

(1) Bryophytes (2) Pteridophytes

(3) Gymnosperms (4) Angiosperms

104. In monocots, the outer covering of the endosperm separates the embryo by a proteinaceous layer called

(1) Scutellum (2) Perisperm

(3) Aleurone layer (4) Embryonal axis

105. **Statement I:** Neutrophils resist infections and also associated with allergic reactions.

Statement II: Eosinophils secrete heparin which involved in inflammatory reactions.

(1) Statement I is true, Statement II is false.

(2) Statement I is false, Statement II is true.

(3) Both Statement I and Statement II are false.

(4) Both Statement I and Statement II are true.

106. The part of the tobacco plant infected by Meloidogyne incognitia is

(1) Flower (2) Stem

(3) Root (4) Leaf

107. Consider the following

a. Continuous migration

b. Random mating

c. No mutations

How many of the above factors are applicable to the population that is in Hardy-Weinberg equilibrium?

(1) Three (2) Zero

(3) Two (4) One

108. The techniques of genetic engineering include all, except

(1) Gene transfer

(2) Contamination-free ambience

(3) Creation of rDNA

(4) Gene cloning

109. If *BamHI* digests the foreign DNA then, the vector DNA should be cut by

(1) EcoRI (2) HindII

(3) BamHI (4) SalI

110. What is the size of a typical eukaryotic cell?

(1) 1-2 µm (2) 0.02-0.2 µm

(3) 0.1 µm (4) 10-20 µm

111. Match the following column I with column II and choose the **correct** option.

Column –I	Column – II
a. Cristae	i. Work like oar causing movement of cell
b. Cilia	ii. Flat and disc shaped structure of an organelle
c. Chromatin	iii. Infoldings of inner membrane of mitochondria
d. Cisternae	iv. Condensed structure of DNA

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

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

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

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

112. Choose the condition which is characterized by loss of glucose through urine and formation of ketone bodies.

(1) Hypoglycemia (2) Diabetes insipidus

(3) Osteoporosis (4) Diabetes mellitus

113. Select the part of the brain which is responsible for urge for eating and drinking.

(1) Hypothalamus (2) Pons

(3) Medulla (4) Cerebellum

114. Consider statements about the habitat vs niche concept:

I. Habitat is the place where an organism lives.

II. Niche encompasses all the physical, chemical and biological factors that a species needs to thrive.

III. Two different species can occupy exactly the same niche indefinitely.

IV. The fundamental niche is always smaller than the realised niche.

(1) I and II only

(2) I, II and III only

(3) All four are correct

(4) I, III and IV only

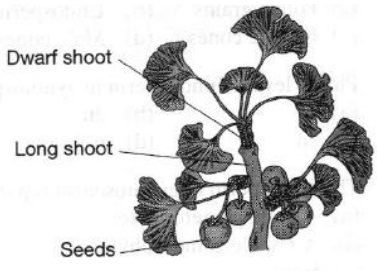
115. A highly effective contraceptive method used by male partner as a terminal method to prevent pregnancy is

(1) Vasectomy (2) Tubectomy

(3) IUI (4) ICSI

116. All of the following are examples of venereal disease, except
(1) Gonorrhoea (2) Hepatitis-B
(3) Syphilis (4) Typhoid

117. Identify the given figure and select the incorrect Statement:



(1) Ovules are not enclosed by any ovary wall
(2) Multicellular female gametophyte is retained within the megasporangium
(3) Possess endosperm as post-fertilisation tissue
(4) Represents a living fossil

118. The nervous system of cockroach consists of a series of fused, segmentally arranged ganglia joined by
(1) Paired longitudinal connectives on the ventral side
(2) Paired longitudinal connectives on the dorsal side
(3) Paired transverse connectives on the dorsal side
(4) Unpaired longitudinal connectives on the ventral side

119. Heterotrophic bacteria are not helpful in
(1) Fixing nitrogen in legume roots
(2) Production of antibiotics
(3) Making curd from milk
(4) Fixing atmospheric carbon dioxide

120. **Statement I:** The sclereids are spherical, oval or cylindrical, highly thickened dead cells with very narrow cavities
Statement II: Mammals from colder climates generally have shorter ears and limbs to minimise heat loss.
(1) Statement I is true, Statement II is false.
(2) Statement I is false, Statement II is true.
(3) Both Statement I and Statement II are false.
(4) Both Statement I and Statement II are true.

121. One of the in-situ conservation strategies is
(1) Zoological park (2) Wildlife safari park
(3) Botanical garden (4) Wildlife sanctuary

122. For which of the following phenotypes test cross is not required to know the genotype?
(1) Tall pea plant
(2) Pea plant bearing axial flowers
(3) Red flowered snapdragon plant
(4) Round seeded pea plant

123. The light harvesting complex of photosynthetic unit. PS II, that is involved in non-cyclic photophosphorylation has
(a) Chlorophyll b
(b) Chlorophyll a
(c) Proteins
(d) Carotenoid
The **correct** one(s) is/are
(1) Only (a) and (c) (2) All (a), (b), (c) and (d)
(3) All except (b) (4) Only (a)

124. In the genetic material of $\phi \times 174$ bacteriophage, which of the following is not present?
(1) Phosphodiester linkage
(2) N-glycosidic linkage
(3) Hydrogen bond
(4) Covalent bond

125. Genotype of parents are given below. Offspring of which parents can have darkest skin colour?
(1) AaBbCc × aabbcc
(2) Aabbcc × aaBbcc
(3) aaBbCc × AaBBCC
(4) AaBbcc × aabbCc

126. Examine statements about the 10% law of energy transfer:
I. The 10% law was proposed by Lindeman.
II. On average, only 10% of energy is transferred from one trophic level to the next.
III. The remaining 90% is lost as heat through respiration.
IV. Because of the 10% law, food chains are generally limited to 3-4 trophic levels.
(1) All four are correct
(2) I, II and IV only
(3) I, III and IV only
(4) II and III only

127. Addition of methyl guanosine triphosphate and adenylate residues as well as removal of introns is required to make the RNA functional. Synthesis of this RNA is catalyzed by

(1) RNA polymerase II
(2) RNA primase
(3) RNA polymerase III
(4) RNA polymerase I

128. The full potential of penicillin as an effective antibiotic was established by

(1) Alexander Fleming
(2) Ernst Chain and Alexander Fleming
(3) Maurice Wilkins
(4) Howard Florey and Ernest Chain

129. Which of the following option is **incorrect**?

a. Pollen grains are generally spherical measuring about 25-50 micrometers.
b. Pollen grains represent male gametes in plants.
c. Autogamy and geitonogamy both are prevented in maize
d. Among animals, insects, particularly bees are the dominant biotic pollinating agents.

Mark **true** or **false** to the above statements.

	a	b	c	d
(1)	T	T	F	F
(2)	T	F	F	T
(3)	T	T	T	F
(4)	T	F	T	T

130. According to the analogy used by Paul Ehrlich, loss of rivets on the wings of an aeroplane can be related to:

(1) Mass extinction of species from the ecosystem
(2) Loss of habitat
(3) Loss of keystone species that drive the major ecosystem
(4) Loss of non-functioning producers in the ecosystem

131. In a normal ECG, _____ represents depolarization of the ventricles. Select the correct option to fill in the blank.

(1) P-wave
(2) QRS complex
(3) T-wave
(4) S-T segment

132. Recombination nodule is formed:

A. Between non-sister chromatids of homologous chromosomes
B. At the site where crossing over occurs
C. In the pachytene stage

(1) Only (A) is correct
(2) Only (B) is correct
(3) Only (A) and (C) are correct
(4) (A) (B) and (C) are correct

133. **Assertion (A):** Lysosomes help in digestion of foreign particles in the animal cells.

Reason (R): They have respiratory enzymes.

(1) If both **A** and **R** are true and **R** is the correct explanation of **A**
(2) If both **A** and **R** are true and **R** is not the correct explanation **A**
(3) If **A** is true but **R** is false
(4) If **A** is false but **R** is true

134. Find the **correctly** matched pair.

(1) Improves the size of apple – Gibberellins
(2) Induce apical dominance – Ethylene
(3) Help to overcome apical dominance – Auxins
(4) Initiate flowering in pineapple – Cytokinins

135. The large holes in 'Swiss Cheese are due to production of a large amount of __A__ by a bacterium named __B__.

(1)	H_2S	*Saccharomyces cerevisiae*
(2)	N_2	*Propinibacterium shermanii*
(3)	CO_2	*Penicillium roqueforti*
(4)	CO_2	*Propionibacterium sharmanii*

136. Select the ciliated protozoan

(1) *Trypanosoma* (2) *Amoeba*
(3) *Paramecium* (4) *Plasmodium*

137. **Statement I:** Colour blindness occurs in about 8 per cent of male and only about 0.4 percent of females.

Statement II: The son of a woman who carries the gene has a 100 per cent chance of being colour blind.

(1) Statement I is true, Statement II is false.
(2) Statement I is false, Statement II is true.
(3) Both Statement I and Statement II are false.
(4) Both Statement I and Statement II are true.

138. (a) DNA
(b) Nucleosome (c) Chromosome
(d) Chromatin (e) A nucleotide
Select the option that represents ascending order of the condensation of the above given materials in an organism
(1) Nucleotide, DNA, Chromatin, Nucleosome, Chromosome
(2) Nucleotide, DNA, Nucleosome, Chromatin, Chromosome
(3) DNA, Nucleotide, Nucleosome, Chromosome, Chromatin
(4) Nucleotide, Nucleosome, DNA, Chromosome, Chromatin

139. Match the groups of organism given in column I with the percent of organisms of that group presently facing the threat of extinction and choose the **correct** option.

Column – I	Column – II
a. Mammals	i. 32%
b. Gymnosperms	ii. 23%
c. Amphibians	iii. 12%
d. Birds	iv. 31%

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

140. All are correct for a person having 'AB' blood group, **except**
(1) No antibodies in plasma
(2) Antigens A and B on RBCs
(3) Universal recipient
(4) Can donate the blood to other person having blood group 'A' or 'B'

141. Select the incorrect option w.r.t. blood vessels in humans.
(1) Each artery and vein consists of three layers
(2) Tunica intima is the inner lining composed of squamous endothelium
(3) Tunica media is comparatively thin in the veins
(4) Tunica externa is the outer layer composed of smooth muscles and elastic fibres

142. Complete the analogy by selecting the correct option.
Mole: Marsupial mole :: Lemur : _____
(1) Numbat (2) Spotted cuscus
(3) Koala (4) Bandicoot

143. Which of the following is not the excretory structure in male cockroach?
(1) Fat body
(2) Urecose gland
(3) Malpighian tubules
(4) Green glands

144. How many of the bones given in the box below are unpaired bones in an adult man?
Hyoid, Sphenoid, Mandible, Maxilla, Sternum, Frontal, Parietal, Ethmoid, Lacrimal
(1) Five (2) Six
(3) Four (4) Seven

145. Choose the **incorrect** statement.
(a) The transfer of fluid from the glomerulus to Bowman's capsule occurs via active transport
(b) Collecting duct descends deep into the renal medulla only in juxtamedullary nephrons
(c) Collecting duct passes urine to the renal pelvis
(d) Cortical nephrons are extremely important for water conservation in mammals
(1) (a) (b) and (d)
(2) (a) and (d)
(3) (c) and (d)
(4) (a) and (b)

146. **Statement I:** Unipolar neurons are found in the cerebral cortex
Statement II: Bipolar neurons are found in the retina of eye
(1) Statement I is true, Statement II is false.
(2) Statement I is false, Statement II is true.
(3) Both Statement I and Statement II are false.
(4) Both Statement I and Statement II are true.

147. Name the lipid which contains 16 carbons including carboxyl carbon.
(1) Arachidonic acid
(2) Adenylic acid
(3) Palmitic acid
(4) Linolenic acid

148. Choose the option that indicates incorrect fact associated with the given events.

(1)	Normal inspiration	– Contraction of external intercostal muscles
(2)	Forceful expiration	– Contraction of additional muscles of abdomen
(3)	Normal expiration	– Diaphragm arches upward
(4)	Normal inspiration	– Volume of thoracic cavity decreases

149. Chose the **incorrect** statement wr.t. nucleic acids.

(1) Heterocyclic rings are found
(2) DNA and RNA consist of nucleosides only
(3) Adenine and guanine are found both in DNA and RNA
(4) Thymidylic acid and uridylic acid are nucleotides

150. Choose the statement among the following which is **not correct** w.r.t. factors affecting enzyme activity.

(1) Low temperature preserves the enzyme in a temporarily inactive state
(2) Enzyme activity decreases above optimum temperature
(3) Competitive inhibitor competes with the formed product
(4) Increase in substrate concentration increases the velocity of enzymatic reaction initially

151. The number of intrachain disulphide bonds present within light chains of a monovalent antibody molecule are

(1) One (2) Two
(3) Three (4) Four

152. Notochord is persistent throughout their life in all of the following, except

(1) Scoliodon (2) Branchiostoma
(3) Pristis (4) Pterophyllum

153. Consider the following features.

a. Absence of coelom.
b. Presence of ciliated comb plates.
c. Indirect development

Choose the correct organism exhibiting above characters.

(1) Ctenophora (2) Adamsia
(3) Planaria (4) Spongilla

154. Select the odd one among the following w.r.t. oviparity.

(1) Labeo (2) Ichthyophis
(3) Pteropus (4) Neophron

155. 'X' is the vital link that ensures continuity of species between organisms of one generation and the next. Identify the 'X' and select an option that exhibits same ploidy as that of 'X'.

(1) Primary spermatocyte
(2) Secondary oocyte
(3) Spermatozoa
(4) Ootid

156. **Assertion (A):** Myelinated cranial nerves are enveloped by Schwann cells.

Reason (R): Schwann cells produce myelin sheath around the cell body of neurons.

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(3) (A) is correct, (R) is incorrect
(4) Both (A) and (R) are incorrect

157. Choose the **incorrect** statement.

(1) Primary sex organ in females is located inside the abdominal cavity
(2) The secretion of unpaired accessory glands of a human male primarily helps in lubrication of the penis
(3) The part of oviduct, closer to the ovary is called infundibulum.
(4) The enlarged distal end of penis is called the glans penis

158. All of the following are functions of placenta, except

(1) Acts as an endocrine tissue
(2) Supply of O_2 and CO_2 to foetus
(3) Removal of excretory wastes
(4) Provides nutrients to the embryo

159. In root tip the cells in the region of meristematic activity

(1) Are responsible for the formation of the lateral roots
(2) Have dense protoplasm
(3) Form very fine and thread-like structures called root hairs
(4) Are large and thick walled which do not divide

160. Heart is two-chambered and fertilization is usually external in

(1) Pristis
(2) Labeo
(3) Bufo
(4) Scoliodon

161. Consider the following statements about the importance of biodiversity:

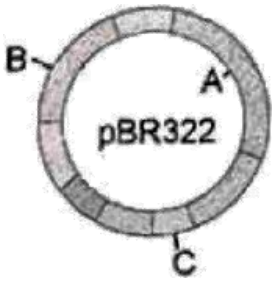
I. Narrowly utilitarian argument: biodiversity provides food, medicines and other direct benefits.
II. Broadly utilitarian argument: biodiversity plays a role in providing ecosystem services like O_2 production and pollination.
III. The ethical argument holds that every species has an intrinsic value regardless of human use.
IV. The rivet-popper hypothesis by Paul Ehrlich suggests every species is equally critical (no redundancy).

(1) I, II and III only
(2) All four are correct
(3) I and II only
(4) II, III and IV only

162. How many copies of DNA are synthesized after 10 cycle of PCR using one dsDNA template?

(1) 512 (2) 1024
(3) 256 (4) 2048

163. Given below is the diagram of cloning vector pBR322.



Choose the option representing **correct** labeling.

	A	B	C
(1)	tet^R	PstI	PvuII
(2)	amp^R	EcoRI	PstI
(3)	tet^R	PvuII	PvuI
(4)	amp^R	SalI	PvuII

164. Match column-I with column-II and select the **correct** option.

Column – I	Column – II
a. Vasectomy	i. Phagocytosis of sperms within the uterus
b. IUDs	ii. Removal of a part of fallopian tube
c. Tubectomy	iii. Blocks entry of sperms through cervix
d. Cervical caps	iv. Removal of a part of vas deferens

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

165. A hormone 'X' stimulates the formation of erythrocytes. From the given options select the **correct** location from the where 'X' is produced.

(1) Alpha cells of pancreas
(2) The bone marrow cells
(3) The cells of neurohypophysis
(4) Juxtaglomerular cells

166. A method of molecular diagnosis based on antigen-antibody interaction

(1) Is used for early diagnosis of disease
(2) Is a conventional method
(3) Requires DNA polymerase
(4) Is used for amplification of a nucleic acids

167. The typical osmolarity of human blood under normal physiological conditions is

(1) 600 mOsmol L^{-1} (2) 300 mOsmol L^{-1}
(3) 30 mOsmol L^{-1} (4) 1200 mOsmol L^{-1}

168. In humans, biconcave enucleated cells in blood have an average life span of

(1) 60 days (2) 7 days
(3) 15 days (4) 120 days

169. The volume of air involved in breathing movements can be estimated by using a

(1) Spirometer
(2) Sphygmomanometer
(3) ECG
(4) Stethoscope

170. Consider the given statements and choose the **correct** option.

Statement-A: In the absence of carbonic anhydrase, the reaction of formation of carbonic acid is very slow, about 2000 molecules of H_2CO_3 being formed in an hour.

Statement-B: By using carbonic anhydrase, the reaction of H_2CO_3 formation speeds up with about 600,000 molecules being formed every minute.

(1) Both statements are correct
(2) Only statement A is correct
(3) Only statement B is correct
(4) Both statements are incorrect

171. Select the **correct** match w.r.t barriers of innate immunity.

(1)	Cellular barrier	– Saliva
(2)	Physical barrier	– Mucus coating of GIT
(3)	Physiological barrier	– Interferons
(4)	Cytokine barrier	– macrophage

172. Which of the following statements are correct?

A. Inspiration & expiration are carried out by creating pressure gradients between atmosphere and Alveoli.
B. Exchange of O_2 & CO_2 are carried out by diffusion at alveoli.
C. In FRC volume of air that will remain in lungs after forceful expiration.
D. Maximum volume of air a person can breathe out after a forced inspiration is VC

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

173. All of the following structures are absent in gymnosperm, except

(1) Companion cells
(2) Sieve tubes
(3) Vessels
(4) Albuminous cells

174. What is the site for active ribosomal RNA synthesis?

(1) Mesosomes
(2) Golgi body
(3) Nucleolus
(4) Peroxisomes

175. Consider the following statements and select the **correct** option.

Statement A: A space limited by the inner membrane of the chloroplast is called lumen,

Statement B: The ribosomes of the chloroplast are smaller than the cytoplasmic ribosomes in a plant cell.

(1) Only statement A is correct
(2) Only statement B is correct
(3) Both statements A and B are correct
(4) Both statements A and B are incorrect

176. The growth pattern of a plant is different from the growth pattern of an animal in having:

(1) Localised growth centres
(2) Indefinite growth
(3) open growth
(4) All the above

177. Point out the correct floral formulae of Cruciferae:

(1) $\oplus \; ♂ ♀ \; K_{4 \text{ or } 5} \; C_{4 \text{ or } 5} \; A_{\infty} \; \underline{G_1}$

(2) $\oplus \; ♂ ♀ \; P_{3+3} \; A_{3+3} \; \underline{G_{(3)}}$

(3) $\oplus \; ♂ ♀ \; K_{(5)} \; C_{1+2+(2)} \; A_{1+(9)} \; \underline{G_1}$

(4) $\oplus \; ♂ ♀ \; K_{2+2} \; C_{\times 4} \; A_{2+4} \; \underline{G_{(2)}}$

178. MMC undergoes __A__ division and results in the production of __B__ megaspores.

Select the **correct** option for A and B.

	A	**B**
(1)	Mitotic	2
(2)	Meiotic	4
(3)	Mitotic	4
(4)	Meiotic	2

179. Read the following statements.

(a) Both DNA and RNA are able to mutate at the same rate

(b) RNA viruses evolve slower because of single strand

(c) RNA can directly code for the synthesis of proteins

(d) Presence of 5-methyl uracil confers additional stability to DNA

(e) A DNA molecule has free –OH group at both 3' and 2' carbon of pentose sugar

The **incorrect** ones are

(1) (a) (b) and (e) (2) (a) (d) and (e)

(3) (c) and (d) (4) (a) and (b) only

180. Match the following columns and select the **correct** option.

a. *Penicillium*	i. Sexual reproduction is unknown
b. Trichoderma	ii. Edible basidiocarp
c. Albugo	iii. Causes white spots on mustard
d. Agaricus	iv. Produces sexual spores inside the sac

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

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

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

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

Syllabus

FT – 6

Day & Date : 05 June, 2026

Time : 10: 00 AM to 1: 00 PM

Physics : FULL COURSE

Chemistry : FULL COURSE

Biology : FULL COURSE