Aakash
Medical | IIT-JEE | Foundations

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Udyog Vihar, Gurugram, Haryana - 122018, ***Ph.***011-47623456

MM : 720 Final Test Series(P2)-2024-25_Test-07D **Time : 180 Min.**

Topics Covered:
Complete Syllabus of Class XI & XII

General Instructions :
Duration of Test is 3 hrs.
The Test consists of 180 questions. The maximum marks are 720.
There are three parts in the question paper consisting of Physics, Chemistry, Biology which have 45 questions each in Physics & Chemistry and 90 questions in Biology.
Each question carries +4 marks. For every wrong response, –1 mark shall be deducted from the total score. Unanswered/unattempted questions will be given no marks.
Use blue/black ballpoint pen only to darken the appropriate circle.
Mark should be dark and completely fill the circle.
Dark only one circle for each entry.
Dark the circle in the space provided only.
Rough work must not be done on the Answer sheet and do not use white fluid or any other rubbing material on the Answer sheet.

PHYSICS

1. Pitch of a screw gauge is 1 mm and divisions on its circular scale is 50, then the least count of the screw gauge is

(1) 0.02 mm

(2) 0.01 mm

(3) 0.2 mm

(4) 0.1 mm

2. Relative permeability of iron is 5500, then its magnetic susceptibility will be

(1) 5499

(2) 5501

(3) 5500×10^{7}

(4) 5500×10^{-7}

3. A wire of length 6.28 m is bent into a circular coil of 4 turns. If a current of 1 A exists in the coil, the magnetic moment of the coil (in A m^2) is

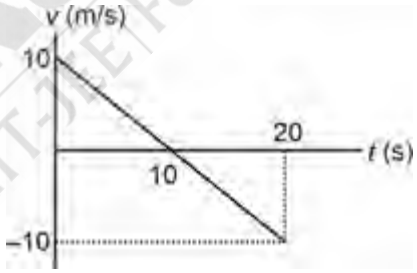
(1) 2π

(2) $\frac{\pi}{4}$

(3) 4π

(4) $\frac{\pi}{2}$

4. The velocity-time graph for a particle moving on a straight line is shown below.



Consider the following statements regarding this graph and choose the correct option.
a. The particle has a constant acceleration.
b. The particle never turns around.
c. The particle has zero displacement in 0 to 20 s.

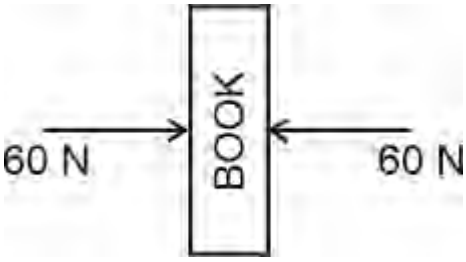
(1) a and c are correct

(2) b and c are correct

(3) a and b are correct

(4) All a, b and c are correct

5. A book of weight 30 N is pressed between two hands and each hand exerts a force of 60 N as shown. If the book is just about to slide down, then coefficient of friction between the book and the hand is



(1) 0.25

(2) 0.3

(3) 0.5

(4) 0.4

6. A body is thrown horizontally from the top of a tower. It reaches the ground after 2 s and hit the ground at an angle 45°. The initial velocity of projection is (g = 10 m/s^2)

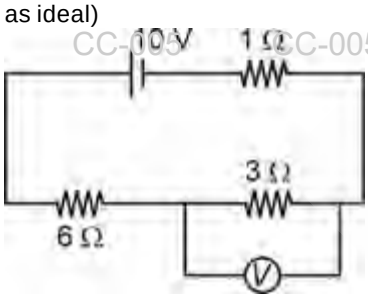
(1) 40 m/s

(2) 10 m/s

(3) 20 m/s

(4) $10\sqrt{2}\ \mathrm{m/s}$

7. The voltmeter reading in given circuit is (consider voltmeter as ideal)



(1) 3 V

(2) 6 V

(3) 8 V

(4) 1 V

8. A light ray travel from a denser medium to a rarer medium. If critical angle is 30°, then maximum possible deviation of any ray will be

(1) 60°

(2) 150°

(3) 120°

(4) 90°

9. **Assertion (A):** A soap film in sun light appears colourful.
Reason (R): Thin films produce interference of light.
In the light of the above statements, choose the correct answer from the options given below.

(1) Both (A) and (R) are correct and (R) is correct explanation of (A)

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

(3) (A) is correct and (R) is incorrect

(4) Both (A) and (R) are incorrect

10. First law of thermodynamics is based on

(1) Newton's law

(2) Law of conservation of energy

(3) Charle's law

(4) Law of heat exchange

11. The length of a metallic rod is 4 m at 0°C and becomes 4.01 m, on heating upto 100°C. The coefficient of linear expansion will be

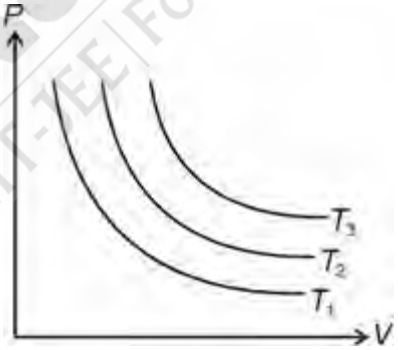
(1) $2 \times 10^{-5}\ \mathrm{C}^{-1}$

(2) $2.5 \times 10^{-5}\ \mathrm{C}^{-1}$

(3) $2.0 \times 10^{-4}\ \mathrm{C}^{-1}$

(4) $2.5 \times 10^{-4}\ \mathrm{C}^{-1}$

12. The figure shows graph of pressure and volume of an ideal gas at temperatures T_1, T_2 and T_3. Choose the correct relation.



(1) $T_1 > T_2 > T_3$

(2) $T_3 > T_2 > T_1$

(3) $T_1 = T_2 = T_3$

(4) $T_2 > T_3 > T_1$

13. Match the following and choose the correct option.

	List I		List II
a.	Elastic collision	(i)	$0 < e < 1$
b.	Perfectly Inelastic collision	(ii)	$e = 0$
c.	Explosion	(iii)	$e = 1$
d.	Inelastic collision	(iv)	Final kinetic energy is greater than initial kinetic energy

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

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

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

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

14. Given below are two statements

Statement A: Torque is equal to rate of change of linear momentum.

Statement B: Moment of inertia depends upon the distribution of mass around the axis of rotation.

In the light of above statements choose the most appropriate answer from the options given below.

(1) Both statements A and statement B are correct

(2) Both statements A and statement B are incorrect

(3) Statement A is correct and statement B is incorrect

(4) Statement A is incorrect and statement B is correct

15. The displacement of a particle varies according to relation $x = 2\,[\cos\pi t + \sin\pi t]$. The maximum velocity of the particle will be (All quantities are in SI unit)

(1) 2π

(2) $\sqrt{2}\pi$

(3) $2\sqrt{2}\pi$

(4) π

16. The magnitude of the gravitational field at distance r_1 and r_2 from the centre of a uniform sphere of radius R and mass M are F_1 and F_2 respectively. Then consider the following statements and choose the most appropriate option.

a. $\frac{F_1}{F_2} = \frac{r_1}{r_2}$ if $r_1 < R$ and $r_2 < R$

b. $\frac{F_1}{F_2} = \left(\frac{r_2}{r_1}\right)^2$ if $r_1 > R$ and $r_2 > R$

c. $\frac{F_1}{F_2} = \frac{r_1}{r_2}$ if $r_1 > R$ and $r_2 > R$

d. $\frac{F_1}{F_2} = \left(\frac{r_1}{r_2}\right)^2$ if $r_1 < R$ and $r_2 < R$

(1) Only a and b are true

(2) Only b and c are true

(3) Only a, b and d are true

(4) All are true

17. Momentum of photon of wavelength λ and frequency ν is (h is Planck's constant)

(1) $\frac{h\lambda}{c}$

(2) $\frac{h\lambda}{c^2}$

(3) $\frac{h\nu}{c}$

(4) Zero

18. A stretched string of length 0.25 m fixed at both ends and have third harmonic frequency 600 Hz, the velocity of transverse wave in string will be

(1) 300 m/s

(2) 200 m/s

(3) 350 m/s

(4) 100 m/s

19. A child walks towards a fixed plane mirror at a speed of 4 km/h. The magnitude of velocity of image of child with respect to child will be

(1) 4 km/h

(2) 2 km/h

(3) 8 km/h

(4) Zero

20. In YDSE, when a metal plate is placed in path of one of the interfering beams of light. Then

(1) The fringes become blurred

(2) The fringes become brighter

(3) The fringes disappear

(4) The fringe width increases

21. The radius of nuclide X is measured to be thrice the radius of $^{9}_{4}\mathrm{Be}$. The number of nucleons in X are

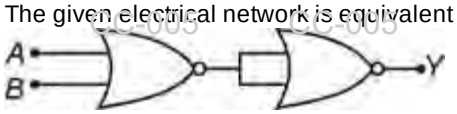
(1) 27

(2) 243

(3) 72

(4) 81

22. The given electrical network is equivalent to



(1) OR gate

(2) NOR gate

(3) AND gate

(4) NAND gate

23. As the electric field across a conductor decreases, the mobility of free electrons

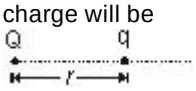
(1) Decreases

(2) Increases

(3) First increases then decreases

(4) Remains constant

24. A point charge Q is fixed and another point charge q is left free at a distance r from the fixed charge Q. Kinetic energy of charge q when it will be at a distance $2r$ from the fixed charge will be



(1) $\frac{1}{8\pi\varepsilon_0}\frac{Qq}{r}$

(2) $\frac{1}{4\pi\varepsilon_0}\frac{3Qq}{r}$

(3) $\frac{1}{4\pi\varepsilon_0}\frac{2Qq}{r}$

(4) $\frac{1}{4\pi\varepsilon_0}\frac{Qq}{r}$

25. An e.m.f of 12 V is induced in a given coil when the current in it changes at the rate of 48 ampere per minute. The self–inductance of the coil is.

(1) 15 Henry

(2) 1.5 Henry

(3) 0.15 Henry

(4) 0.015 Henry

26. The initial phase angle for current $I = 10 \sin \omega t + 8 \cos \omega t$, is

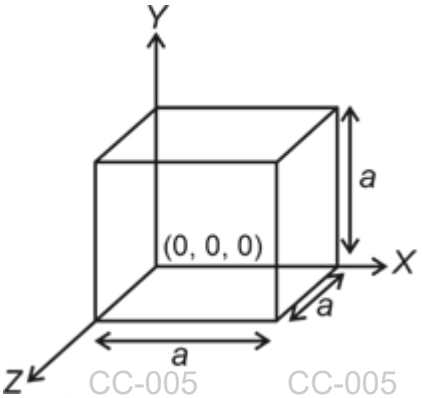
(1) $\tan^{-1}\left(\frac{4}{5}\right)$

(2) $\tan^{-1}\left(\frac{5}{3}\right)$

(3) $\sin^{-1}\left(\frac{4}{5}\right)$

(4) 90°

27. Electric field passing through a cubical region as shown in figure is given by $E_X = 100x^3$ N/C, $E_Y = E_Z = 0$. The charge enclosed within the cube is



(1) $2a^5\varepsilon_0$

(2) $100a^5\varepsilon_0$

(3) $\frac{a^5\varepsilon_0}{100}$

(4) $\frac{a^5\varepsilon_0}{25}$

28. What is the order of energy of X-rays (E_X), radiowaves (E_R) and microwaves (E_m)?

(1) $E_X < E_R < E_m$

(2) $E_X > E_m > E_R$

(3) $E_m > E_X > E_R$

(4) $E_m < E_R < E_X$

29. Two long parallel straight wires A and B, separated by a distance of 6 cm, carries currents i and $2i$ respectively in the same direction. The distance from wire B at which the net field will be zero, is

(1) 1 cm

(2) 2 cm

(3) 4 cm

(4) 5 cm

30. Initially, sphere A has charge –60 e and sphere B has charge of +20 e. The sphere are made of conducting material and are identical in size. If spheres touch each other, the resulting charge on sphere A will be

(1) –15 e

(2) –20 e

(3) +25 e

(4) +30 e

31. For intrinsic semiconductor

(1) $n_e = n_h$

(2) $n_e < n_h$

(3) $n_e > n_h$

(4) $n_e = 2n_h$

32. An atom emits a spectral line of wavelength λ when an electron makes a transition between levels of energy E_1 and E_2. The correct relation among the following is

(1) $\lambda = \frac{hc}{E_1+E_2}$

(2) $\lambda = \frac{2hc}{E_1-E_2}$

(3) $\lambda = \frac{2hc}{E_1+E_2}$

(4) $\lambda = \frac{hc}{E_1-E_2}$

33. If 64 identical conducting spheres of charge q and capacitance C are combined to form a sphere, then capacitance of the sphere so formed is given by

(1) 2C

(2) C

(3) 4C

(4) 5C

34. When a metallic surface is illuminated by a light of frequency f, photoelectrons of maximum kinetic energy 1 eV are emitted. When the same surface is illuminated by light of frequency $\frac{3f}{2}$, photoelectrons of maximum kinetic energy 4 eV are emitted. The work function of the metal is

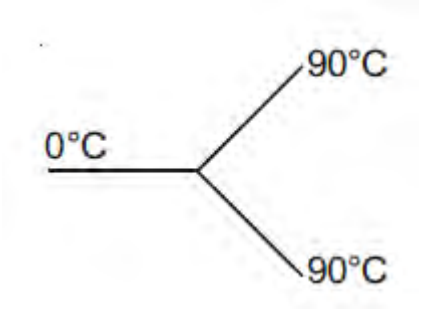
(1) 5 eV

(2) 4 eV

(3) 3 eV

(4) 2 eV

35. Three rods made of same material and having same cross-section have been joined as shown in figure. Each rod is of same length. The temperature at the junction of three rods is



(1) 60°C

(2) 45°C

(3) 90°C

(4) 30°C

36. A particle is executing SHM with time period T. Time taken by it to travel from mean position to $\frac{1}{\sqrt{2}}$ times its amplitude is equal to

(1) $\frac{T}{6}$

(2) $\frac{T}{12}$

(3) $\frac{T}{8}$

(4) $\frac{T}{4}$

37. A wire of natural length L, Young's modulus Y and area of cross section A is extended by ΔL. The energy stored per unit volume in the wire is given by

(1) $\frac{YA^2\Delta L}{2L}$

(2) $\frac{YA\Delta L}{2L}$

(3) $\frac{Y(\Delta L)^2}{2L^2}$

(4) $\frac{YA(\Delta L)^2}{2L}$

38. A beaker containing a liquid of density ρ moves up with an acceleration a. The pressure due to the liquid at a depth h below the free surface of the liquid is

(1) ρgh

(2) $\frac{\rho gh}{2}$

(3) ρh(g + a)

(4) ρh(g – a)

39. The breaking stress of a wire depends upon

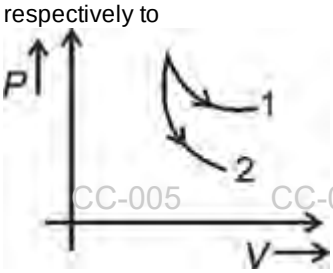
(1) Length of the wire

(2) Radius of the wire

(3) Material of the wire

(4) Shape of cross-section

40. *P-V* plots for two gases during adiabatic processes are shown in figure. Plots 1 and 2 should correspond respectively to



(1) He and N_2

(2) O_2 and N_2

(3) He and Ar

(4) O_2 and He

41. The displacement *x* of a body of mass 1 kg on horizontal smooth surface as a function of time *t* is given by $x = \frac{t}{3}$. The work done in the first second is

(1) 4 J

(2) 2 J

(3) 1 J

(4) Zero

42. If the polar ice caps of the earth melts, then the length of day will

(1) Increase

(2) Decrease

(3) Remains same

(4) Earth stops to rotate

43. A particle has initial velocity equal to $\left(3\hat{i}+8\hat{j}\right)$ m/s. If it has a constant acceleration $\vec{a}=\left(2\hat{i}+2\hat{j}\right)$ m/s^2, then its velocity at time *t* = 3 s will be

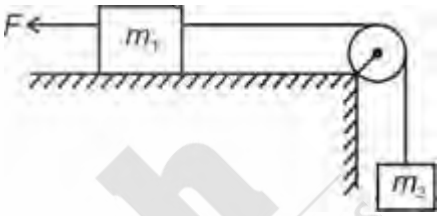
(1) $\left(9\hat{i}+14\hat{j}\right)$ m/s

(2) $\left(9\hat{i}+8\hat{j}\right)$ m/s

(3) $\left(6\hat{i}+6\hat{j}\right)$ m/s

(4) $\left(8\hat{i}+8\hat{j}\right)$ m/s

44. A constant force $F=\frac{m_2}{2}g$ is applied on the block of mass m_1 as shown in figure. The string and the pulley are light and the surface of the table is smooth. The acceleration of m_1 is



(1) $\frac{m_1 g}{2(m_1+m_2)}$

(2) $\frac{m_2 g}{2m_1}$

(3) $\frac{m_1 g}{2m_2}$

(4) $\frac{m_2 g}{2(m_1+m_2)}$

45. When water falls from a tap, down the streamlines

(1) Area decreases

(2) Area increases

(3) Velocity remains same

(4) Area remains same

CHEMISTRY

46. A biomolecule contains 0.1% Fe by mass. The minimum molecular mass possible for the biomolecule is

(1) 56000 u

(2) 5600 u

(3) 28000 u

(4) 2800 u

47. Which of the following has least number of atoms?

(1) 1 g of H_2

(2) 1 g of O_3

(3) 1 g of He

(4) 1 g of P_4

48. The frequency of radiation emitted when the electron falls from n = 3 to n = 1 in a hydrogen atom will be
(Ionization energy of H = 2.18×10^{-18} J)

(1) $2.9 \times 10^{15}\ s^{-1}$

(2) $3.4 \times 10^{5}\ s^{-1}$

(3) $2.9 \times 10^{12}\ s^{-1}$

(4) $5.6 \times 10^{14}\ s^{-1}$

49. The correct order of electronegativity on Pauling scale is

(1) N < O < P < S

(2) P < S < N < O

(3) S < P < O < N

(4) S < P < N < O

50. The correct order of negative electron gain enthalpy for group 16 elements is

(1) O > S > Se > Te > Po

(2) S > O > Se > Te > Po

(3) S > Se > O > Te > Po

(4) S > Se > Te > Po > O

51. 2 mole of an ideal gas at 127°C undergoes expansion isothermally and reversibly from 1 litre to 10 litre. The entropy change in the process is

(1) 38.29 J/K

(2) 32.94 J/K

(3) 46.34 J/K

(4) 44.44 J/K

52. For the reaction,
3A(g) + B(s) → 3C(g)
If $\Delta U° = -10$ kJ, $\Delta S° = -50\ JK^{-1}$
Calculate the value of $\Delta G°$ at 298 K

(1) –4.9 kJ

(2) –14.9 kJ

(3) 4.9 kJ

(4) 14.9 kJ

53. Among the following options, select the pair of non-isostructural species.

(1) SiF_4 and SF_4

(2) IO_3^- and XeO_3

(3) BH_4^- and NH_4^+

(4) PF_6^- and SF_6

54. Which of the following options represent the correct bond order?

(1) $O_2^- < NO < C_2^{2-} < He_2^+$

(2) $NO < C_2^{2-} < O_2^- < He_2^+$

(3) $C_2^{2-} < He_2^+ < NO < O_2^-$

(4) $He_2^+ < O_2^- < NO < C_2^{2-}$

55. If K_1 and K_2 are respective equilibrium constants for the two reactions.
$XeF_6(g) + H_2O(g) \rightleftharpoons XeOF_4(g) + 2HF(g)$; (K_1)
$XeO_4(g) + XeF_6(g) \rightleftharpoons XeOF_4(g) + XeO_3F_2(g)$; (K_2)
The equilibrium constant of the reaction
$XeO_4(g) + 2HF(g) \rightleftharpoons XeO_3F_2(g) + H_2O(g)$ will be

(1) $\frac{K_1}{(K_2)^2}$

(2) $K_1 \times K_2$

(3) $\frac{K_1}{K_2}$

(4) $\frac{K_2}{K_1}$

56. The solubility product of CuS, CuI and HgS are 6.3×10^{-36}, 1.1×10^{-12} and 10^{-54} respectively. Identify the correct decreasing order of their solubility.

(1) HgS > CuI > CuS

(2) CuS > CuI > HgS

(3) CuI > CuS > HgS

(4) CuI > HgS > CuS

57. Oxidation state of P in PO_4^{3-}, of S in SO_4^{2-} and that of Cr in $Cr_2O_7^{2-}$ respectively are

(1) +3, +6 and +5

(2) +5, +3 and +6

(3) +3, +6 and +6

(4) +5, +6 and +6

58. Consider the following statements.
a. $CO_2(g)$ is used as refrigerant for ice-cream and frozen food.
b. The structure of C_{60} contains twelve six carbon rings and twenty five carbon rings.
c. ZSM-5, a type of zeolite is used to convert alcohols directly into gasoline.
d. CO_2 is colourless and odourless gas.
Choose the correct statement(s)

(1) a and b only

(2) c and d only

(3) a and d only

(4) a, b and c only

59. The correct order of stability of +1 oxidation state for group 13 elements is

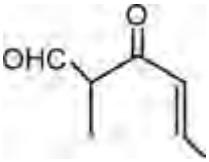
(1) Ga < In < Al < Tl

(2) Al < Ga < In < Tl

(3) Tl < In < Ga < Al

(4) In < Tl < Ga < Al

60. The IUPAC name of compound is



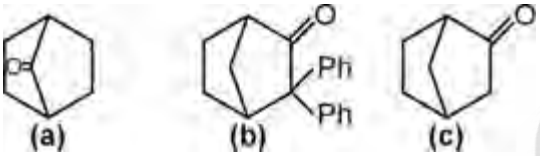
(1) 3-keto-2-methylhex-4-enal

(2) 5-formylhex-2-en-3-one

(3) 5-methyl-4-oxohex-2-en-5-al

(4) 3-keto-2-methylhex-5-enal

61. Which among the given molecules can exhibit tautomerism?



(1) c only

(2) a and c only

(3) a and b only

(4) b and c only

62. In the Kjeldahl's method for estimation of nitrogen present in soil sample, ammonia evolved from 0.50 g of sample neutralised 10 mL of 1 M H_2SO_4. The percentage of nitrogen in the soil is

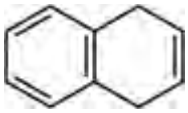
(1) 28%

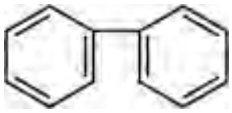
(2) 44%

(3) 56%

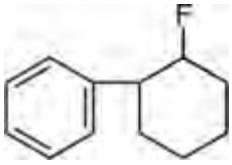
(4) 64%

63. In the given reaction

(1) 

(2) 

(3) 

(4) 

64. In the reaction

$$HC \equiv CH \xrightarrow[\text{(ii) } CH_3CH_2Br]{\text{(i) } NaNH_2 \text{ / Liq. } NH_3} X \xrightarrow[\text{(ii) } CH_3CH_2Br]{\text{(i) } NaNH_2 \text{ / Liq. } NH_3} Y$$

X and Y are

(1) X = 2-Butyne; Y = 3-Hexyne

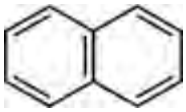
(2) X = 2-Butyne; Y = 2-Hexyne

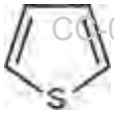
(3) X =1-Butyne; Y = 2-Hexyne

(4) X = 1-Butyne; Y = 3-Hexyne

65. Which among the following compounds is non-aromatic?

(1) 

(2) 

(3) 

(4) 

66. Which of the following is not a colligative property?

(1) Depression in freezing point

(2) Relative lowering of vapour pressure

(3) Osmotic pressure

(4) Vapour pressure

67. If vapour pressure of two liquids A and B are 100 torr and 140 torr, respectively then total vapour pressure of the solution obtained by mixing 4 moles of A and 6 moles of B would be

(1) 110 torr

(2) 115 torr

(3) 124 torr

(4) 120 torr

68. The molar conductivity of 0.25 M solution of KCl having conductivity of 1.25×10^{-3} S cm^{-1} will be

(1) 2.5 S cm^2 mol^{-1}

(2) 1.5 S cm^2 mol^{-1}

(3) 5.0 S cm^2 mol^{-1}

(4) 7.25 S cm^2 mol^{-1}

69. Limiting molar conductivities for NaCl, HCl and CH_3COONa respectively are 126.4, 425.9 and 91.0 S cm^2 mol^{-1}. Limiting molar conductivity for CH_3COOH is

(1) 690.5 S cm^2 mol^{-1}

(2) 590.5 S cm^2 mol^{-1}

(3) 390.5 S cm^2 mol^{-1}

(4) 490.5 S cm^2 mol^{-1}

70. Consider the following statements
(i) A small amount of the catalyst can catalyse a large amount of reactants.
(ii) A catalyst does not alter change in Gibbs energy (ΔG) of a reaction.
(iii) A catalyst catalyses both spontaneous and non-spontaneous reactions.
The correct statements are

(1) (ii) and (iii) only

(2) (i) and (ii) only

(3) (i) and (iii) only

(4) (i), (ii) and (iii)

71. The rate constant for a chemical reaction taking place at 500 K is expressed as $k = Ae^{-1000}$. The activation energy of the reaction is

(1) 100 cal mol^{-1}

(2) 1000 kcal mol^{-1}

(3) 10^4 kcal mol^{-1}

(4) 10^6 kcal mol^{-1}

72. Choose the incorrect match.

	Order		Property
(a)	$H_2O > H_2Te > H_2Se > H_2S$	–	Melting point
(b)	$H_2Te > H_2Se > H_2S > H_2O$	–	Dissociation constant
(c)	$H_2O > H_2S > H_2Se > H_2Te$	–	Bond angle
(d)	$H_2Te > H_2Se > H_2S > H_2O$	–	Boiling point

(1) (a)

(2) (b)

(3) (c)

(4) (d)

73. Match the reactions given in column-I with the catalyst used given in column-II.

	Column-I		Column-II
(a)	Hydrogenation of fats	(i)	$PdCl_2$
(b)	Manufacture of polythene	(ii)	Ni
(c)	Haber's process	(iii)	$TiCl_4 + Al(CH_3)_3$
(d)	Wacker's process	(iv)	Fe

Choose the correct answer from the options given below.

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

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

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

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

74. Incorrect statement regarding interstitial compounds is

(1) They have high melting point, higher than those of pure metals.

(2) They are very hard, some borides approach diamond in hardness.

(3) They retain metallic conductivity.

(4) They are chemically very reactive.

75. Facial-meridional isomerism is associated with which one of the following complexes?

(1) $[Co(NH_3)_3Cl_3]$

(2) $[Co(en)_2Cl_2]Cl$

(3) $[Co(en)_2ClBr]I$

(4) $[Co(NH_3)_5(CO_3)]Cl$

76. Consider the following two statements.
Statement (I): The metal carbon bond in metal carbonyls possess both sigma and pi character.
Statement (II): Metal carbon sigma bond is formed by donation of lone pair of electrons on the carbonyl carbon into a vacant orbital of the metal.
In the light of above two statements, choose the correct option.

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

(2) Statement (I) is correct and statement (II) is incorrect

(3) Statement (I) is incorrect and statement (II) is correct

(4) Both statement (I) and statement (II) are incorrect

77. Given below are two statements, one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A) : A mixture containing two enantiomers in equal proportions will have zero optical rotation.
Reason (R) : The process of conversion of enantiomer into a racemic mixture is known as racemisation.
In the light of above statements, choose the most appropriate answer from the options given below.

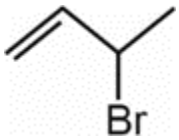
(1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion

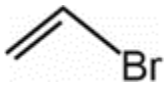
(2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion

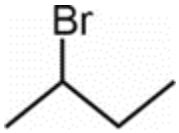
(3) Assertion is true statement but Reason is false

(4) Both Assertion and Reason are false statements

78. Which among the following will react fastest by S_N1 mechanism?

(1) 

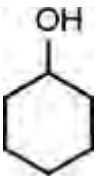
(2) 

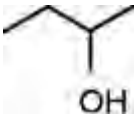
(3) 

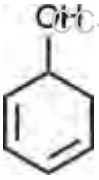
(4) 

79. The alcohol which dehydrates most easily in presence of concentrated sulphuric acid is

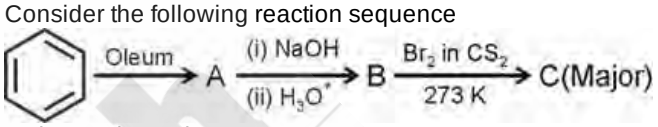
(1) 

(2) 

(3) 

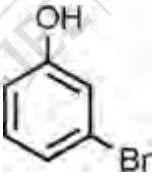
(4) 

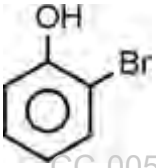
80. Consider the following reaction sequence

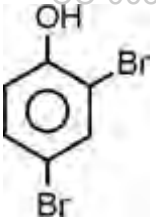


Major product C is

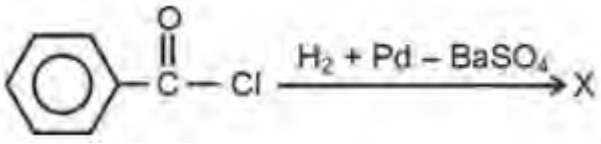
(1) 

(2) 

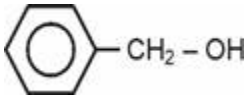
(3) 

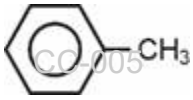
(4) 

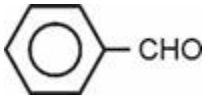
81. In the following reaction, product X is



(1) 

(2) 

(3) 

(4) 

82. Which of the following organic compound(s) undergo(es) disproportionation reaction with conc. NaOH?
(A) Propionaldehyde
(B) Formaldehyde
(C) Butanone
(D) Benzaldehyde

(1) (A) only

(2) (B) and (D) only

(3) (A), (B) and (C) only

(4) (A), (C) and (D) only

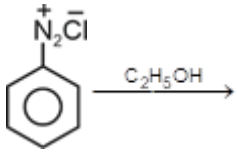
83. Given below are two statements.
Statement I : During nitration of aniline using HNO_3 and H_2SO_4, significant amount of meta derivative is formed.
Statement II : In strongly acidic medium, aniline is protonated to form the anilinium ion which is meta directing.
In the light of above statements, choose the correct answer from the options given below.

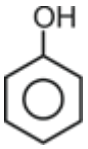
(1) Both statement I and statement II are correct

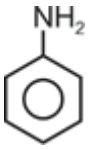
(2) Both statement I and statement II are incorrect

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

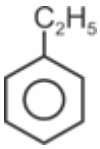
(4) Statement I is incorrect but statement II is correct

84.  A(Major). Product A is

(1) 

(2) 

(3) 

(4) 

85. Which of the following is not a pyrimidine base?

(1) Cytosine

(2) Thymine

(3) Guanine

(4) Uracil

86. Incorrect statement among the following is

(1) Amylose is water soluble component of starch

(2) Amylopectin constitutes about 80-85% of starch

(3) Amylopectin is long unbranched chain polymer of α-D–(+) glucose units

(4) In amylose α–D–(+)–glucose units are held together by C1 – C4 glycosidic linkage

87. Group reagent for precipitating the ion Ba^{2+} is

(1) $H_2S + NH_4OH$

(2) $(NH_4)_2CO_3 + NH_4OH$

(3) Dil. HCl

(4) $NH_4OH + NH_4Cl$

88. Colour of phenolphthalein in acidic medium is

(1) Pink

(2) Orange

(3) Blue

(4) Colourless

89. Match Column-I with Column-II

	Column-I (Salts)		**Column-II (pH)**
a.	0.1 M NaCl	(i)	$\frac{1}{2}[pK_w + pK_a + \log C]$
b.	0.1 M NH_4Cl	(ii)	$\frac{1}{2}[pK_w - pK_b + pK_a]$
c.	0.1 M CH_3COONa	(iii)	$\frac{pK_w}{2}$
d.	0.1 M NH_4CN	(iv)	$\frac{1}{2}[pK_w - pK_b - \log C]$

Choose the **correct** option.

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

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

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

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

90. Match the **Column-I** of reactions with **Column-II** containing their respective reagents and reaction conditions and choose the **correct** option.

	Column-I		**Column-II**
a.	Conversion of phenol into benzene	(i)	Red hot Fe tube/873 K
b.	Conversion of n-hexane into benzene	(ii)	Mo_2O_3/Δ
c.	Controlled oxidation of methane into methanal	(iii)	Cr_2O_3, 773 K 10-20 atm
d.	Cyclic polymerisation of ethyne into benzene	(iv)	Zn/Δ

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

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

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

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

BIOLOGY

91. Read the following statements and select the **correct** option.

Statement A: Higher the category, fewer will be the number of common characters and greater is the difficulty of determining the relationship to other taxa at same level.

Statement B: Genus is a group of related species which has less characters in common in comparison to species of other genera.

(1) Both statements A and B are correct

(2) Both statements A and B are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

92. According to five kingdom classification, how many kingdoms are having organisms with heterotrophic mode of nutrition with eukaryotic cell type?

(1) Three

(2) Two

(3) Four

(4) Five

93. Select the **incorrectly** matched pair.

(1) Dmitri Ivanowsky – Found certain microbes as causal organism of the mosaic disease of tobacco

(2) M.W. Beijerinek – *Contagium vivum fluidum*

(3) T.O. Diener – Discovered prions

(4) W.M. Stanley – Virus could be crystallised and crystals consists largely of protein

(1) (1)

(2) (2)

(3) (3)

(4) (4)

94. Which of the following is **not** the characteristics of Chlorophyceae?

(1) They usually have a rigid cell wall made of an inner layer of cellulose and an outer layer of pectose

(2) Storage body called pyrenoids located in the chloroplasts

(3) The stored food is very similar to amylopectin and glycogen in structure

(4) Some of them may store food in the form of oil droplets

95. Select **odd** one out w.r.t. zygomorphic flower

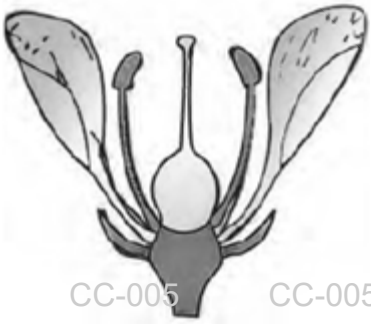
(1) Pea

(2) Mustard

(3) *Cassia*

(4) Bean

96. Select the **odd** one out w.r.t. given figure



(1) The flower has inferior ovary

(2) It is a hypogynous flower

(3) Calyx, corolla and androecium in the given flower are situated below the ovary

(4) Brinjal is one of the example of this kind of position of floral whorls on thalamus.

97. Read the following statements (a to d)

a. The adaxial and abaxial epidermis of the leaf have stomata in equal number

b. The hypodermis in stem consists of a few layers of collenchymatous cells

c. Mesophylls is differentiated into palisade and spongy parenchyma in leaf.

d. Vascular bundles differ in size in stem

How many of the above features is/are **correct** for a monocot plant?

(1) Four

(2) Three

(3) One

(4) Two

98. Open vascular bundle is a feature of

(1) Dicot stem

(2) Monocot stem

(3) Dicot leaf

(4) Monocot leaf

99. In which of the following type of chromosome, centromere is slightly away from the middle of the chromosome resulting into one shorter arm and one longer arm?

(1) Metacentric chromosome

(2) Telocentric chromosome

(3) Acrocentric chromosome

(4) Sub-metacentric chromosome

100. All are the significance of equational division, **except**

(1) They are essential for growth and development of multicellular organism.

(2) They produces new cells for healing the wounds

(3) They brings about reproduction in unicellular organisms

(4) They increase the genetic variability in the population

101. During which phase DNA replication begins in the nucleus and the centriole duplicates in the cytoplasm in animal cells?

(1) S phase

(2) G_0 phase

(3) G_1 phase

(4) G_2 phase

102. Which of the following scientists showed that only the green part of the plants can release oxygen?

(1) Joseph Priestley

(2) Jan Ingenhousz

(3) Julius von Sachs

(4) T.W. Engelmann

103. Which one of the given reactions does **not** involve decarboxylation?

(1) α-ketoglutarate → Succinyl CoA

(2) Pyruvate → Acetyl CoA

(3) Malic acid → Oxaloacetic acid

(4) Citrate → α-ketoglutarate

104. The hormone which promotes nutrient mobilisation thereby, helping in delay of leaf senescence and overcoming apical dominance is

(1) Ethylene

(2) ABA

(3) Gibberellin

(4) Cytokinin

105. Presence of unisexual male and female flowers on same plant prevents

(1) Autogamy and geitonogamy

(2) Autogamy but not geitonogamy

(3) Both geitonogamy and xenogamy

(4) Geitonogamy but not xenogamy

106. Choose the **incorrect** feature w.r.t. the type of epithelium that lines the small intestine.

(1) Composed of a single layer of tall and slender cells

(2) Nuclei are located at the base of cells

(3) Free surface possesses microvilli

(4) Main function is to provide protection against chemical and mechanical stresses

107. Select the **correct** option to complete the analogy w.r.t male *Periplaneta americana*.

Anal style : 9^{th} abdominal segment :: Anal cerci : _____ abdominal segment

(1) 6^{th}

(2) 8^{th}

(3) 7^{th}

(4) 10^{th}

108. 'X' is a type of biomacromolecule which constitutes 10-15% of the total cellular mass. All of the following structures belong to the category of 'X', **except**

(1) Collagen

(2) RuBisCO

(3) Inulin

(4) Glucagon

109. Choose the **incorrect** match w.r.t. a healthy adult man.

(1) Normal inspiration – Increased volume of thoracic chamber

(2) Forced expiration – Contraction of external inter-costal muscles

(3) Normal expiration – Relaxation of diaphragm

(4) Respiratory minute volume – 6000 to 8000 mL

110. Read the given statements and select the **correct** option.

Statement A: The systemic circulation provides nutrients, O_2 and other essential substances to the tissues and takes CO_2 and other harmful substances away for elimination.

Statement B: The hepatic portal vein carries blood from liver to the intestine before it is delivered to the systemic circulation.

(1) Both statements A and B are correct

(2) Both statements A and B are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

111. Select the excretory waste that is not removed by liver in humans.

(1) Degraded steroid hormones

(2) Cholesterol

(3) Bilirubin

(4) Hydrocarbon and waxes

112. In an adult man, the total number of phalanges in one forelimb is equal to the total number of _____. Select the **correct** option to fill in the blank.

(1) Facial bones

(2) Thoracic vertebrae

(3) Ribs

(4) Cranial bones

113. *Eco*RI is a restriction endonuclease, isolated from

(1) *Entamoeba histolytica*

(2) *Entamoeba coli*

(3) *Escherichia coli*

(4) *Enterobius vermicularis*

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

	Column I		Column II
a.	Addison's disease	(i)	Hypersecretion of thyroxine
b.	Acromegaly	(ii)	Hyposecretion of thyroxine
c.	Cretinism	(iii)	Hypersecretion of growth hormone in adults
d.	Graves' disease	(iv)	Hyposecretion of hormones by adrenal cortex

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

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

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

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

115. Consider the given features :
a. Absence of excretory system
b. Possesses complete digestive system
c. Difference of symmetry between adult and larval forms
d. Dioecious
Select the organism that possesses all of the above given features.

(1) *Aplysia*

(2) *Antedon*

(3) *Ascaris*

(4) *Anopheles*

116. Which of the following contrasting trait of pea plant express in homozygous condition only?

(1) Violet flower colour

(2) Axial flower position

(3) Green pod colour

(4) Constricted pod shape

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

	Column I		Column II
a.	AA + XO	(i)	Butterfly
b.	AA + XY	(ii)	Birds
c.	AA + ZW	(iii)	*Drosophila*
d.	AA + ZO	(iv)	Grasshopper

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

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

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

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

118. Select the **odd** one out w.r.t. salient features of human genome.

(1) The human genome contains 3164.7 million bp

(2) The largest known human gene being dystrophin with 2.4 million bases and TDF gene as smallest gene with 14 bases

(3) More than 2 percent of the genome codes for proteins

(4) Chromosome 1 has most genes and the Y has the fewest gene

119. Read the following statements and select the **correct** option.
Statement A: *Trichoderma* species are free living fungi that are very common in the root ecosystems and are effective against several plant pathogens.
Statement B: Ladybird, a beetle with red and black markings, is useful in controlling mosquitoes.

(1) Both statements A and B are correct

(2) Both statements A and B are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

120. The maximum number of individuals of a population which can be supported by a habitat with optimum resources for their survival is called

(1) Mortality

(2) Biotic potential

(3) Carrying capacity

(4) Vital index

121. Read the following statements (a to d).
a. Species composition and stratification are the functional components of an ecosystem.
b. Producers are also known as converters or transducers.
c. Net primary productivity is the available biomass for the consumption to heterotrophs.
d. Sugarcane field and coral reefs are least productive ecosystems.
In the light of above statements select the **correct** ones from the options given below.

(1) Only a, b and c

(2) Only b and c

(3) Only c and d

(4) Only b and d

122. In *lac* operon, β-galactosidase is coded by

(1) *i* gene

(2) *a* gene

(3) *z* gene

(4) *y* gene

123. Select the **incorrectly** matched pair.

(1) RNA polymerase I – 5.8S, 18S, 28S rRNA synthesis

(2) RNA polymerase II – hnRNA synthesis

(3) RNA polymerase III – ScRNA, 5S rRNA and Sn RNA synthesis

(4) Helicase – Unwinding of DNA helix during transcription

(1) (1)

(2) (2)

(3) (3)

(4) (4)

124. Which of the following features are **true** for the plants of family Solanaceae?
(a) Flowers have bilateral symmetry
(b) Exstipulate leaves
(c) Swollen placenta with many ovules
(d) Non-endospermous seeds

(1) (a) & (b)

(2) (c) & (d)

(3) (a) & (d)

(4) (b) & (c)

125. In the fluid mosaic model of the cell membrane

(1) Lipids are arranged in a single layer

(2) Proteins are sandwiched between two layers of lipids

(3) Proteins are represented as icebergs in the sea of lipids

(4) Proteins are arranged in a continuous sheet on the membrane surface

126. Read the following statements.
Assertion (A): Carboxylation leads to fixation of carbon dioxide into the stable organic compound intermediate.
Reason (R): Carboxylation is the most crucial step of the Calvin cycle.
In the light of above statements, choose the **correct** option.

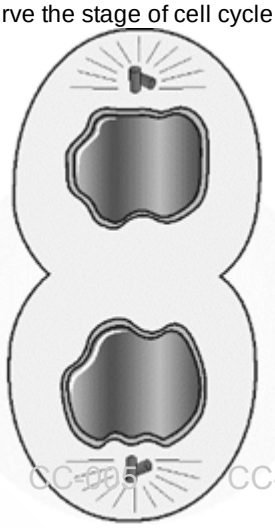
(1) Both (A) and (R) are true and (R) is the correct explanation of (A)

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

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

127. Observe the stage of cell cycle shown below.



Choose the **incorrect** statement w.r.t. to this stage of cell cycle.

(1) Nucleolus, golgi and ER reform.

(2) Chromosomes condense and get their individuality.

(3) Nuclear envelope develops around the chromosome clusters.

(4) Referred as the last stage of karyokinesis.

128. Mark the **incorrect** statement about Down's syndrome.

(1) It develops due to trisomy of chromosome number 21

(2) It is an autosomal recessive disorder.

(3) Persons with this syndrome are short statured.

(4) Physical, psychomotor and mental development of the individual in this disorder is retarded.

129. Observe the following steps/tools employed during DNA fingerprinting:
(a) Hybridisation with radioactively labelled probe
(b) Restriction endonuclease treatment
(c) Electrophoresis
(d) DNA isolation
(e) Southern blotting
(f) Autoradiography
The **correct** sequential order of these events is

(1) d $\rightarrow$b $\rightarrow$f $\rightarrow$e $\rightarrow$c $\rightarrow$a

(2) a $\rightarrow$f $\rightarrow$d $\rightarrow$b $\rightarrow$c $\rightarrow$e

(3) a $\rightarrow$b $\rightarrow$c $\rightarrow$e $\rightarrow$f $\rightarrow$d

(4) d $\rightarrow$b $\rightarrow$c $\rightarrow$e $\rightarrow$a $\rightarrow$f

130. Many zooplanktons show a stage of suspended development called

(1) Hibernation

(2) Migration

(3) Aestivation

(4) Diapause

131. The follicular/proliferative phase of menstrual cycle in a normal human female is not characterized by

(1) Gradual increase in the levels of gonadotropins

(2) Increase in secretion of progesterone

(3) Regeneration of endometrium

(4) Development of primary follicles

132. Choose the **correct** option to complete the given analogy
Cartilage : Chondrocyte : : Bone : _____

(1) Chondroblast

(2) Fibroblast

(3) Osteocyte

(4) Erythrocyte

133. 'X' are the ancestors of herbaceous lycopods while 'Y' are the descendants of seed ferns.
Choose the option that **correctly** identifies 'X' and 'Y' respectively.

(1) Tracheophyte ancestors; Zosterophyllum

(2) Psilophyton; Rhynia-type plants

(3) Chlorophyte ancestors; Conifers

(4) Zosterophyllum; Cycads

134. Select the **incorrect** option w.r.t pneumonia.

(1) It can be caused by bacteria *Haemophilus influenzae*

(2) In severe cases, lips and finger nails may turn gray to bluish in colour

(3) Can be confirmed by Widal test

(4) Its pathogen infects the alveoli (air-filled sacs) of the lungs

135. **Assertion (A):** In order to make a recombinant DNA molecule, source DNA and vector DNA should be cut with the same restriction enzyme.
Reason (R): Digestion with same restriction enzyme results in the formation of DNA fragments with same type of sticky ends which can be joined together by DNA ligase.
In the light of above statements, select the **correct** option.

(1) Both (A) and (R) are true and (R) is the correct explanation of the (A).

(2) Both (A) and (R) are true but (R) is not the correct explanation of the (A).

(3) (A) is true but (R) is false.

(4) Both (A) and (R) are false.

136. Choose the **odd** one w.r.t hormones that assist in parturition.

(1) Cortisol

(2) Oxytocin

(3) Estrogen

(4) Androgen

137. The common feature between *Rana tigrina* and *Homo sapiens* is the presence of

(1) Renal portal system

(2) Pons

(3) Nucleated RBCs

(4) Unpaired diencephalon

138. Proteins contribute 'X' % of the plasma in human blood. The value of 'X' is equal to the percentage of 'Y' among total WBCs. Choose the correct function of 'Y'.

(1) Secrete histamine, serotonin and heparin

(2) Mainly resist infections and are also associated with allergic reactions

(3) Phagocytic cells with bean shaped nucleus, destroy foreign organisms entering the body

(4) Granulocytes that are responsible for immune responses of the body *via* production of antibodies

139. Total volume of air accommodated in the lungs at the end of a forced inspiration can be represented by all of the following, **except**

(1) VC + RV

(2) EC + IC – RV

(3) RV + IRV + EC

(4) FRC + IC

140. Observe the given diagram and select the **incorrect** option w.r.t it.

(1) Shows anadromous migration

(2) Possesses cartilaginous cranium and vertebral column

(3) Devoid of scales and unpaired fins

(4) Circulation is of closed type

141. In humans, under normal physiological conditions, the fluid which is present throughout the distal convoluted tubule has the osmolarity

(1) Lower than the blood plasma

(2) Same as that of the blood plasma

(3) Higher than the blood plasma

(4) Same as that of the innermost medullary interstitium

142. All of the following are polymeric substances as well as they belong to the category of secondary metabolites, **except**

(1) Rubber

(2) Gums

(3) Cellulose

(4) Glycerol

143. Select the option that **correctly** states the type of joint present between the following w.r.t an adult human.
a. Temporal and occipital
b. Between carpals
c. Between 1st and 2nd cervical vertebrae
d. Between 7th and 8th thoracic vertebrae

	a	b	c	d
(1)	Fibrous	Gliding	Pivot	Cartilaginous
(2)	Hinge	Saddle	Gliding	Fibrous
(3)	Fibrous	Saddle	Hinge	Cartilaginous
(4)	Cartilaginous	Gliding	Pivot	Fibrous

(1) (1)

(2) (2)

(3) (3)

(4) (4)

144. Which of the below given statements are **correct**?
a. Coronary artery disease is often referred to as atherosclerosis.
b. The P-wave of a standard ECG represents the electrical excitation of the ventricles.
c. Amphibians and mammals have a closed circulatory system.
d. The cardiac output is defined as the volume of blood pumped out by each ventricle per second.
Choose the **correct** option.

(1) b and c

(2) a and c

(3) c and d

(4) b and d

145. Downstream processing in biotechnology includes

(1) Introduction of recombinant DNA into host cells

(2) Large scale culture of recombinant bacteria in bioreactors

(3) Isolation of DNA from cell

(4) Separation and purification of recombinant protein

146. Gill cover is absent in

(1) *Pristis*

(2) *Labeo*

(3) *Catla*

(4) *Clarias*

147. In frogs, the testes are adhered to the upper part of

(1) Rectum

(2) Kidneys

(3) Fat bodies

(4) Liver

148. In context of humans, the _____ and _____ become interdigitated with each other and jointly form the placenta. Select the correct option to fill in the blanks respectively.

(1) Uterine tissue; inner cell mass

(2) Inner cell mass; chorionic villi

(3) Inner cell mass; umbilical cord

(4) Chorionic villi; uterine tissue

149. How many of the contraceptive methods given in the box below have similar mode of action?

Implants, Progestogen injections, Cervical caps, Lippes loop, Steroidal contraceptive pills

Choose the **correct** option.

(1) 2

(2) 3

(3) 4

(4) 5

150. According to the connotations of the theory of special creation, the Earth is about

(1) 4500 million years old

(2) 500 million years old

(3) 200 years old

(4) 4000 years old

151. Before the production of insulin by recombinant DNA technology, insulin was extracted from

(1) Pancreas of insects

(2) Liver of cattle and pigs

(3) Pancreas of pigs

(4) Liver of human beings

152. Some strains of *Bacillus thuringiensis* produce a protein that kills certain insects. Select the **incorrect** match.

(1) Lepidopterans – Cotton bollworm, roundworm

(2) Coleopterans – Beetles

(3) Lepidopterans – Tobacco budworm, armyworm

(4) Dipterans – Flies, mosquitoes

153. Read the statements and choose the option that fills the respective blanks **correctly**

Statement-A : A single stranded DNA or RNA tagged with a radioactive molecule is called ___(i)___

Statement-B : Over 95% transgenic animals are ___(ii)___

	(i)	(ii)
(1)	Plasmid	Mice
(2)	Gene taxi	Sheep
(3)	Probe	Mice
(4)	Tracking dye	Goats

(1) (1)

(2) (2)

(3) (3)

(4) (4)

154. The highest failure rate in birth control is associated with natural methods of contraception that include

A. Condoms
B. Periodic abstinence
C. Foam
D. Coitus interruptus
E. IUDs
F. Injectable contraceptives

Select the correct option.

(1) A, B and E

(2) B and D

(3) F and B

(4) A, B and D

155. Match the following w.r.t. convergent evolution.

	Column I		Column II
a.	Bobcat	(i)	Tasmanian wolf
b.	Wolf	(ii)	Tasmanian tiger cat
c.	Anteater	(iii)	Marsupial mole
d.	Mole	(iv)	Numbat

Choose the **correct** option.

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

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

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

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

156. Pyramid of number is inverted or spindle shaped for

(1) Grassland ecosystem

(2) Tree ecosystem

(3) Marine ecosystem

(4) Pond ecosystem

157. About 1000 varieties of mango are found in India. This is an example of

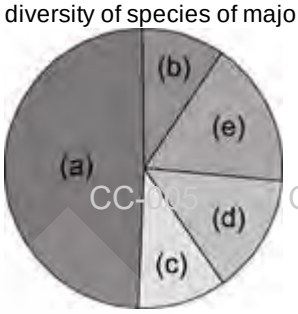
(1) Ecological diversity

(2) Species diversity

(3) Genetic diversity

(4) Community diversity

158. Mark the **correct** option (w.r.t. pie-chart representing global diversity of species of major taxa of vertebrates)



(1) (a) Fishes, (b) Reptiles

(2) (b) Mammals, (e) Birds

(3) (c) Reptiles, (d) Fishes

(4) (d) Amphibians, (e) Mammals

159. Select the **correct** statement regarding *Mycoplasma*.

(1) All of them are beneficial to animals and plants

(2) Possess cell wall

(3) Cannot survive without oxygen

(4) Smallest living cell known

160. Match the placental types (column-I) with their examples (column-II).

Column-I	Column-II
(a) Basal	(i) Mustard
(b) Axile	(ii) China rose
(c) Parietal	(iii) *Dianthus*
(d) Free central	(iv) Sunflower

Choose the correct answer from the following options :

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

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

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

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

161. As compared to monocot root, the dicot root has/ shows

(1) Sclerenchymatous pericycle

(2) Fewer xylem bundles

(3) Large and well developed pith

(4) Primary growth only

162. Read the following statements and select the **correct** option:
Assertion(A): Golgi apparatus remains in close association with the ER.
Reason(R): Materials to be packaged from the ER, fuse with the *cis* face of the Golgi apparatus.

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

(2) Both (A) and (R) are true and (R) is not the correct explanation of (A)

(3) (A) is true but (R) is false

(4) (A) is false but (R) is true

163. In mitochondria, when electrons move through ETS, as a result protons accumulate in the

(1) Matrix

(2) Outer membrane

(3) Perimitochondrial space

(4) Inner membrane

164. A plant growth regulator which is also known as stress hormone

(1) Breaks dormancy of buds

(2) Promotes stem elongation in submerged plant

(3) Is a derivative of carotenoids

(4) Causes quicker maturity in the juvenile conifers

165. Function of filiform apparatus is to

(1) Recognise the suitable pollen at stigma

(2) Stimulate division of generative cell

(3) Produce nectar

(4) Guide the entry of pollen tube

166. Diadelphous condition of stamens in fabaceae is shown by

(1) $A_{(2)}$

(2) $A_{(9)} + 1$

(3) $A_{(2)} + 2$

(4) $A_1 + 9$

167. Match the following columns and choose the **correct** option.

	Column-I		Column-II
a.	Fimbriae	(i)	Provide resistance to antibiotic
b.	Chromatophore	(ii)	Help to attach the bacteria to host tissues
c.	Plasmid	(iii)	Provide buoyancy
d.	Gas vacuole	(iv)	Contains photosynthetic pigments

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

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

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

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

168. Prophase of mitosis is similar to prophase I of meiosis in/as
a. Being short and without substages.
b. Being the phase where splitting of centromere takes place.
c. Both lack crossing over.
d. Nucleolus and nuclear membrane disappear at the end of both the phases.

(1) Only d is true

(2) Only c & d are true

(3) Only a & d are true

(4) b, c & d are true

169. PEN is the result of

(1) Apomixis

(2) Triple fusion

(3) Polyembryony

(4) Syngamy

170. The multicellular female gametophyte is retained within the megasporangium.
This statement holds **true** for

(1) *Chlamydomonas*

(2) *Fucus*

(3) *Volvox*

(4) *Ginkgo*

171. Read the following statements.
a. Chewing tobacco increases blood pressure and heart rate.
b. Morphine is given to a person as a painkiller after surgery
c. Patients are advised to take cocaine which accelerates recovery after surgery
d. Cannabinoids are generally taken by oral ingestion and inhalation.
Choose the correct option w.r.t. **correct** statements.

(1) a, b, c

(2) a, b, d

(3) b, c & d

(4) a, c & d

172. Chitin is present in exoskeleton of arthropods. It is a

(1) Heteropolymer

(2) Polymer of glucose

(3) Polymer of N-acetylglucosamine

(4) Disaccharide

173. Which of the following is a genetic disorder of muscular and skeletal system?

(1) Myasthenia gravis

(2) Arthritis

(3) Osteoporosis

(4) Muscular dystrophy

174. Under normal physiological conditions, a gas 'X' does not play any significant role in regulation of breathing, and its partial pressure in deoxygenated blood is 40 mm Hg. Select the **correct** statement w.r.t. 'X'.

(1) 100 mL of oxygenated blood can deliver 5 mL of 'X' to tissues.

(2) 100 mL of oxygenated blood can deliver 4 mL of 'X' to alveoli.

(3) Changes in concentration of 'X' are only recognised by aortic arch.

(4) Only 80% of 'X' is transported by RBCs.

175. Select the **correct** statement w.r.t. haemodialysis.

(1) Blood drained from convenient artery is pumped into a dialysing unit after adding anti-coagulant histamine.

(2) Dialysing unit contains a straight cellophane tube.

(3) Dialysing fluid has same composition as that of blood plasma except nitrogenous wastes.

(4) This method is a bane for thousands of uremic patients.

176. When a neuron is **not** conducting impulse, then the

(1) Axonal membrane is more permeable to Na^+

(2) Membrane is impermeable to negatively charged proteins

(3) Membrane is nearly impermeable to K^+

(4) Axoplasm inside axon contains low concentration of K^+

177. Which of the following hormones does **not** act *via* generating second messenger?

(1) Insulin

(2) Glucagon

(3) FSH

(4) Testosterone

178. What is true about *Balanoglossus*, *Sepia* and *Antedon*?

(1) All belong to the same phylum

(2) All possess water vascular system

(3) All exhibit radial symmetry

(4) All possess true coelom

179. **Assertion :** There is a delay in the transmission of nerve impulses at each chemical synapse.
Reason : Synaptic delay results from the time taken for the release of the neurotransmitter by presynaptic neuron and in stimulation of the postsynaptic membrane.
In the light of above statements, select the **correct** option.

(1) Assertion and Reason are false statements

(2) Assertion is true statement but Reason is false

(3) Assertion and Reason are true but Reason is not the correct explanation of the Assertion

(4) Assertion and Reason are true and Reason is the correct explanation of the Assertion

180. Study the following statements and select the option having **correct** statements only
(a) The substrate binds to active site of the enzyme,fitting into the active site.
(b) Enzymes isolated from thermophilic organisms get denatured at 50°C.
(c) The active site of enzyme breaks the chemical bond of products and forms a new enzyme-substrate complex.
(d) Prosthetic groups are tightly bound to apoenzyme.

(1) (a) and (c)

(2) (b) and (c)

(3) (a) and (d)

(4) (c) and (d)