Time: 200 Minute   **M.M. 480**

ALL INDIA SKY TEST SERIES

Saarthak Batch - Neet

Date : 05/11/2023

SYLLABUS

PHYSICS	CHEMISTRY	BOTANY	ZOOLOGY
Full Syllabus	**Full Syllabus**	**Full Syllabus**	**Full Syllabus**

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

INSTRUCTIONS:

1. This Question paper is divided in to four parts physics, chemistry, botany, zoology Questions paper you have received contains **ALL THE QUESTIONS** in each Part.
2. **In each part all 30 questions are compulsory**, Each Question has four choices (a), (b), (c), (d) out of which **only one is correct & Carry 4 marks each 1 mark** will be deducted for each wrong answer.

GENERAL INSTRUCTION

1. Use only **blue/black pen (avoid gel pen)** for darkening the bubble.
2. Indicate the correct answer for each question by filling appropriate bubble in your **OMR** answer sheet.
3. The answer sheet will be checked through computer hence, the answer of the question must be marked by –shading the circles against the question by dark **blue/black pen**
4. Blank papers, Clipboards, Log tables, Slide Rule, Calculator, Cellular Phones Papers and Electronic Gadgets in any form are **not** allowed to be carried inside the examination hall.
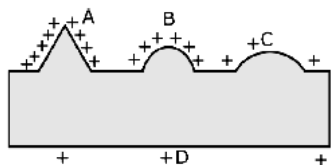
Name of the candidate:_____

Signature of the candidate: _____**Signature of the invigilator:**_____

PHYSICS
SECTION – A

1. In the following figure an isolated charged conductor is shown. The correct statement will be.

   (a) $E_A > E_B > E_C > E_D$ (b) $E_A < E_B < E_C < E_D$
   (c) $E_A = E_B = E_C = E_D$ (d) $E_B = E_C$ and $E_A > E_D$

2. There is an electric field E in X – direction. If the work done on moving a charge 0.2 C through a distance of 2m along a line making an angle 60° with the X –axis is 4.0 J, what is the value of E?
   (a) $\sqrt{3}N/C$ (b) $4N/C$
   (c) $5N/C$ (d) None of these

3. The electric field at a distance of 20 cm from the centre of a dielectric sphere of radius 10 cm is 100 V/m. Electric field at a distance 3cm from the centre of sphere is.
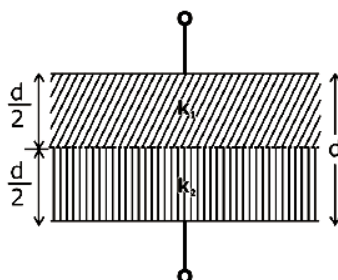   (a) 100 V/m   (b) 125 V/m
   (c) 120 V/m   (d) zero

4. The metal plate on the left in figure carries a charge +q. The metal plate on the right has a charge of – 2q. What charge will flow through S when it is closed, if central plate is initially neutral.
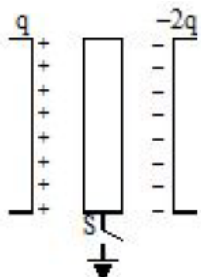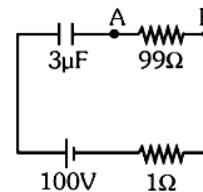

   (a) zero   (b) – q   (c) +q   (d) +2q

5. A parallel plate condenser with plate area A and separation d is filled with two dielectric materials as shown in the adjoining figure. The dielectric constant are k_1 and k_2 respectively. The capacitance will be.
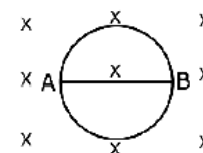

   (a) $\dfrac{\varepsilon_o A}{d}(k_1 + k_2)$ (b) $\dfrac{\varepsilon_o A}{d}\left(\dfrac{k_1 + k_2}{k_1 k_2}\right)$

   (c) $\dfrac{2\varepsilon_o A}{d}\left(\dfrac{k_1 k_2}{k_1 + k_2}\right)$ (d) $\dfrac{2\varepsilon_o A}{d}\left(\dfrac{k_1 + k_2}{k_1 k_2}\right)$

6. The potential difference between point A & B in steady state will be.

   (a) 99 V   (b) 100 V   (c) 97 V   (d) Zero

7. The radius of the circular conducting loop is R. Magnetic field decreasing at a constant rate α. Resistance per unit length of loop is ρ. The current in wire AB is (AB is diameter of loop)

   (a) $\dfrac{R\alpha}{2\rho}$ from A to B   (b) $\dfrac{R\alpha}{2\rho}$ from B to A

   (c) $\dfrac{2R\alpha}{\rho}$ from A to B   (d) Zero

8. A 10 µF capacitor is charged to a potential difference of 1000V. The terminal of the charged capacitor are disconnected from the power supply and connected to the terminals of an uncharged 6µF capacitor. What is the final potential difference across each capacitor.
   (a) 167 V   (b) 100 V   (c) 625 V   (d) 250 V
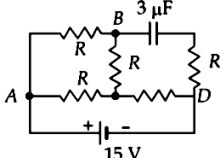
9. If the resistivity of a potentiometer wire be ρ and area of cross section be A then the potential gradient along the wire will be.
   (I = Current)
   (a) $\dfrac{I\rho}{A}$ (b) $\dfrac{I}{\rho A}$ (c) $\dfrac{IA}{\rho}$ (d) IAρ

10. A heater coil is cut into two parts of equal length and one of them is used in the heater. The ratio of the heat produced by this half coil to that by the original coil is.
   (a) 2 : 1   (b) 1 : 2   (c) 1 : 4   (d) 4 : 1

11. An electron is revolving round a proton, producing a magnetic field of 16 weber/m² in a circular orbit of radius 1 Å. It's angular velocity will be.

    (a) 10^{17} rad/sec
    (b) $\dfrac{1}{2\pi} \times 10^{12}$ rad/sec
    (c) $2\pi \times 10^{12}$
    (d) $4\pi \times 10^{12}$ rad/sec

12. In mass spectrograph a potential difference of 1000 V is applied between two plates distance 1 cm apart and magnetic field of B = 1T. The velocity of undeflected positive ions from the velocity selector is.

    (a) 10^7 m/s
    (b) 10^4 m/s
    (c) 10^5 m/s
    (d) 10^2 m/s

13. The magnetic moment of a small current carrying loop is $2.1 \times 10^{-25} amp \times m^2$. The magnetic field at a point on its axis at a distance of 1 Å is.

    (a) 4.2 × 10⁻² weber/m²
    (b) 4.2 × 10⁻³ weber/m²
    (c) 4.2 × 10⁻⁴ weber/m²
    (d) 4.2 × 10⁻⁵ weber/m²

14. A bird is flying 3 m above the surface of water. If the bird is diving vertically down with speed = 6 m/s, his apparent velocity as seen by a stationary fish underwater is.

    (a) 8 m/s   (b) 6 m/s   (c) 12 m/s   (d) 4 m/s

15. The critical angle between an equilateral prism and air is 45°. If the incident ray is perpendicular to the refracting surface, then.
    (a) After deviation it will emerge from the second refracting surface.
    (b) It is totally reflected on the second surface and emerges out perpendicular from third surface in air.
    (c) It is totally reflected from the second and third refracting surface and finally emerges out from the first surface
    (d) It is totally reflected from all the three sides of prism and never emerges out.

16. A boy is trying to start a fire by focusing sunlight on a piece of paper using an equiconvex lens of focal length 10 cm. The diameter of the sun is 1.39 × 10⁹ m and its mean distance from the earth is 1.5 × 10¹¹ m. What is the diameter of the sun's image on the paper?

    (a) $9.2 \times 10^{-4} m$
    (b) $6.5 \times 10^{-4} m$
    (c) $6.5 \times 10^{-5} m$
    (d) $12.4 \times 10^{-4} m$

17. Two thin lenses of focal length 20 cm and 25 cm are placed in contact. The effective power of the combination is.
    (a) 45 dioptres
    (b) 9 dioptres
    (c) 1/9 dioptre
    (d) 6 dioptres

18. In Young's double slit experiment, 12 fringes are observed by light of λ = 600 nm in a certain segment of the screen. If wavelength is changed to 400 nm then number of fringes in the same segment will be.
    (a) 12   (b) 18   (c) 24   (d) 30

19. The contrast in the fringes in any interference pattern depends on.
    (a) Fringe width
    (b) ratio of width of slits
    (c) distance between the slits
    (d) wavelength

20. Three polaroids are kept coaxially. Angle between the first and third polaroid is 90°. Angle between the first and second polaroid is 60°. If unpolarized light energy incident on the first polaroid is I_o .Light energy that emerges from the system is

    (a) zero
    (b) $\dfrac{3I_o}{32}$
    (c) $\dfrac{3I_o}{16}$
    (d) $\dfrac{\sqrt{3}I_o}{8}$

21. In the circuit shown, the cell is ideal with emf = 15V, and each resistance is 6Ω. The potential difference (in steady state) across the capacitor is.

    (a) 15 V   (b) 12 V   (c) 9 V   (d) zero

22. A charge Q is situated at the center of a cube, the electric flux passed through all the six faces of the cube is.

    (a) $\dfrac{Q}{6\epsilon_o}$
    (b) $\dfrac{Q}{8\epsilon_o}$
    (c) $\dfrac{Q}{\epsilon_o}$
    (d) $\dfrac{Q}{2\epsilon_o}$

23. Two positive point charges $q_1 = 16\mu C$ and $q_2 = 4\mu C$ are separated in vacuum by a distance of 3.0 m. At what point on the line between the charges where the net electric field is zero.
    (a) 1m from q_2
    (b) 1.5 m from q_2
    (c) 2m from q_1
    (d) 1.5 m from q_1

24. Two electrons are moving with the same speed v. One electron enters a region of uniform electric field while the other enters a region of uniform magnetic field, then after sometime if the de-Broglie wavelength of the two are λ₁ and λ₂ then.
    (a) $\lambda_1 = \lambda_2$
    (b) $\lambda_1 > \lambda_2$
    (c) $\lambda_1 < \lambda_2$
    (d) λ_1 can do be greater then or less then λ_2

25. A concave mirror for face viewing has focal length of 0.4 m. The distance at which you hold the mirror from your face in order to see your image upright with a magnification of 5 is.
(a) 0.16 m   (b) 1.60 m   (c) 0.32m   (d) 0.24 m

26. A vessel of depth 2h is half filled with a liquid of refractive index $2\sqrt{2}$ and the upper half with another liquid of refractive index $\sqrt{2}$. The liquids are immiscible. The apparent depth of the inner surface of the bottom of vessel will be.
(a) $\dfrac{h}{\sqrt{2}}$ (b) $\dfrac{3}{4}h\sqrt{2}$ (c) $\dfrac{h}{3\sqrt{2}}$ (d) $\dfrac{h}{2(\sqrt{2}+1)}$

27. A double convex lens has power P alnd same radii of curvature R of both the surface. The radius of curvature of a surface of a plano – convex lens made of the same material with power 1.5P is.
(a) 2R   (b) $\dfrac{R}{2}$ (c) $\dfrac{3R}{2}$ (d) $\dfrac{R}{3}$

28. A ray of light is incident at an angle of 60° on one face of a prism of angle 30°. The emergent ray of light makes an angle of 30° with incident ray. The angle made by the emergent ray with second face of prism will be.
(a) 0°   (b) 45°   (c) 90°   (d) 30°

29. If the de Broglie wavelength associated with a proton and an α - particle are equal, then the ratio of velocities of the proton and the α - particle will be.
(a) 1 : 2   (b) 2 : 1   (c) 1 : 4   (d) 4 : 1

30. Work done to bring two charges of 5 μC and 10 μC from 1 m apart to 0.5 m apart is?
(k = 9×10^9)
(a) 7×10^{-1} J   (b) 9×10^{-1} J
(c) 9×10^1 J   (d) 9×10^{-2} J
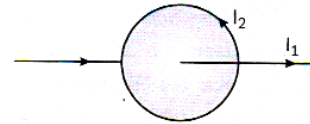
31. Potential difference between A and C is :
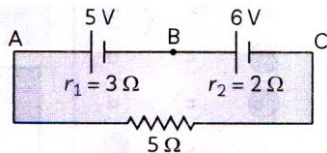
(a) 55 V   (b) 0.55 V   (c) 550 V   (d) 5.5 V

32. A wire of resistance 10 Ω is elongated by 10%. The new resistance is :
(a) 2R   (b) 16 R   (c) 4 R   (d) 0.5 R

33. In force on the given coil will be :

(a) BILsin θ   (b) BIL   (c) 0   (d) BILcos θ

34. Two wires of same length and carrying same current are in shape square and a circle. Ratio of their magnetic moments is :
(a) 4 : π   (b) π : 2   (c) 2 : π   (d) π : 4

35. The direction of force acting on a charge particle q, moving with a velocity $\vec{v}$ in a uniform magnetic field $\vec{B}$ is :
(a) Perpendicular to $\vec{v}$ and parallel to $\vec{B}$
(b) Parallel to $\vec{v}$ and perpendicular to $\vec{B}$
(c) Parallel to both $\vec{v}$ and $\vec{B}$
(d) Perpendicular to both $\vec{v}$ and $\vec{B}$

SECTION - B

36. Graphical representation of electric field due to uniformly charged sphere of radius R as function of distance from its centre is given by :

(a)   (b)
(c)   (d)
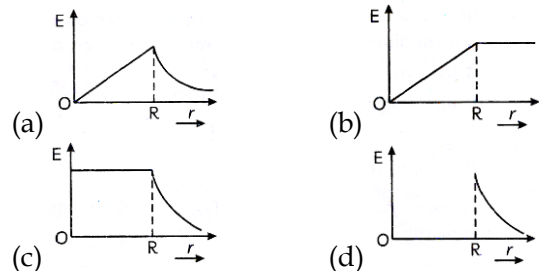
37. Inside a magnet, magnetic lines :
(a) do not exist
(b) are from South pole to North pole
(c) are from North pole to South pole
(d) remain scattered

38. A charge +Q is placed at the centre of α dotted circle. Work done in taking charge +q from A to B is W_1 and B to C is W_2. Then.
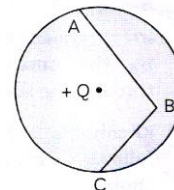
(a) $W_1 > W_2$ (b) $W_1 < W_2$
(c) $W_1 = W_2$ (d) $W_1 \neq W_2$

39. In a uniformly charged conducting sphere, W in moving a charge from point A to point B is:
    (a) Always zero   (b) May by zero
    (c) Non – zero   (d) Both (a) and (b)

40. F is the force and r is the distance between two charges q. If charges are holved and distance is doubled, then the new force will be.
    (a) F/8   (b) F/16   (c) 4F   (d) F/4

41. R is the equivalent resistance of n resistors of same reistance in series. If the connection is turned parallel then equivalent resistance will be.
    (a) n^2R (b) nR   (c) R/n   (d) R/n^2

42. Kirchhoff's current law is consequence of:
    (a) conservation of momentum
    (b) conservation of charge
    (c) conservation of mass
    (d) conservation of energy

43. Emf induced in coil at t = 2 s when instantaneous flux linked is $\phi = (5t^2 – 100t + 300)$ Wb:
    (a) 300 V   (b) 140 V   (c) 40 V   (d) – 40 V

44. Potential difference of 11 V is applied across three capacitors of capacitance 1 μF connected in series. Potential difference across capacitor of 1 μF is:
    (a) 4V   (b) 6 V   (c) 1 V   (d) 2 V

45. If the value of magnetic field is reduced to half and velocity of charged particle is doubled then the radius of path of charged particle will be.
    (a) 2 times   (b) 8 times   (c) 3 times (d) 4 times

46. n equally spaced plates are stacked to make a parallel plate capacitor. If C is the capacitance between two adjacent plates, the resultant capacitance is.
    (a) nC   (b) n^2C (c) (n – 1) C   (d) C/n

47. The ratio of the de-Broglie wavelengths of proton and electron having same kinetic energy (Assume $m_p = m_e \times 1849$)
    (a) 1 : 62   (b) 1 : 43   (c) 2 : 43   (d) 1 : 30

48. A proton and an α – particle are accelerated from rest by 2 V and 4 V potentials respectively. The ratio of their de-Broglie wavelength is
    (a) 16 : 1   (b) 8 : 1   (c) 2 : 1   (d) 4 :1

49. The de-Broglie wavelength of an electron having kinetic energy E is λ. If the kinetic energy of electron becomes $\frac{E}{4}$, then its de-Broglie wavelength will be
    (a) $\sqrt{2}\lambda$ (b) 2λ (c) $\frac{\lambda}{\sqrt{2}}$ (d) $\frac{\lambda}{2}$

50. An α – particle, a proton and an electron have the same kinetic energy. Which one of the following is correct in case of their de-Broglie wavelength?
    (a) $\lambda_\alpha > \lambda_p > \lambda_e$ (b) $\lambda_\alpha < \lambda_p < \lambda_e$
    (c) $\lambda_\alpha = \lambda_p = \lambda_e$ (d) $\lambda_\alpha > \lambda_p < \lambda_e$

CHEMISTRY
SECTION – A

51. The reaction conditions leading to the best yields of C_2H_5Cl are
    (a) C_2H_6 (excess) + Cl_2 $\xrightarrow{UV\ light}$
    (b) C_2H_6 + Cl_2 $\xrightarrow[room\ temperature]{dark}$
    (c) C_2H_6 + Cl_2 (excess) $\xrightarrow{UV\ light}$
    (d) C_2H_6 + Cl_2 $\xrightarrow{UV\ light}$

52. Which of the following is an example of S_N2 reaction ?
    (a) $CH_3Br + OH^- \rightarrow CH_3OH + Br^-$
    (b) $CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3 + OH^- \rightarrow CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$
    (c) $CH_3CH_2OH \xrightarrow{-H_2O} CH_2 = CH_2$
    (d) $(CH_3)_3$ C-Br + $OH^- \rightarrow (CH_3)_3 COH + Br^-$

53. The order of reactivities of the following alkyl halides for a S_N2 reaction is
    (a) RF > RCl > RBr > RI
    (b) RF > RBr > RCl > RI
    (c) RCl > RBr > RF > RI
    (d) RI > RBr > RCl > RF

54. Highest oxidation state of manganese in fluoride is +4 (MnF_4) but highest oxidation state in oxides is +7 (Mn_2O_7) because _____.
    (a) fluorine is more electronegative than oxygen.
    (b) fluorine does not possess d-orbitals.
    (c) fluorine stabilises lower oxidation state.
    (d) in covalent compounds fluorine can form single bond only while oxygen forms double bond.

55. Possible major product formed in the reaction of neopentylacohol with HCl is
    (a) 2-chloro-2-methylbutane
    (b) 2, 2-dimethyl 1-chloropropane
    (c) 2-chloro-3-methylbutane
    (d) 3, Chloro-3-methylbutane

56. Trichloroacetaldehyde, CCl_3 CHO reacts with chlorobenzene in presence of sulphuric acid and produces

    (a)

    (b)

    (c)

    (d)
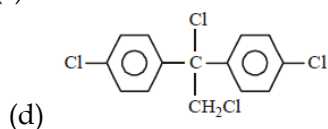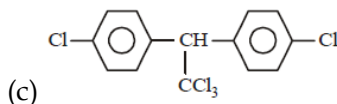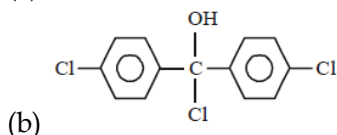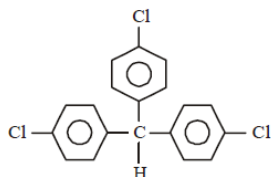
57. Following statements are given regarding the preparation of aryl halides from toluene. Read the following statements and choose the correct option.
    (i)   Aryl chlorides and bromides can be easily prepared by this method.
    (ii) The ortho and para isomers formed in the reaction can not be separated easily due to small difference in their melting point.
    (iii) Reactions with iodine are reversible in nature and require the presence of an oxidizing agent.
    (iv) Fluoro compound are not prepared by this method due to low reactivity of fluorine.
    (a) (i) and (iii) are correct
    (b) (ii) and (iv) are correct
    (c) (i), (ii), and (iii) are correct
    (d) All statements are correct

58. Read the following statements and choose the correct code
    (i) S_N2 reactions follows a second order kinetic whereas S_N1 reactions follows the first order kinetics
    (ii) S_N1 reactions follows the second order kinetics whereas S_N2 follows the first order kinetics
    (iii) S_N2 reactions take place in a single step whereas S_N1 reactions take place in a two steps
    (iv) Terticary alkyl halides are least reactive towards S_N2 reactions but we show high reactivity towards S_N1 reaction.
    (a) (ii) and (iv) are correct
    (b) (i) and (iii) are correct
    (c) (i), (ii) and are correct
    (d) (i), (iii) and (iv) are correct

59. Match the columns

Column I	Column II
(A) C_2H_6 $\xrightarrow{Cl_2/UV\ light}$	(p) Finkelstein reaction
(B) $C_6H_5NH_2$ $\xrightarrow[273-278K]{NaNO_2+HCl/Cu_2Cl_2}$	(q) Free radical substitution
(C) $CH_3Cl+NaI \rightarrow CH_3I+NaCl$	(r) Swarts reaction
(D) CH_3-$Br+AgF \rightarrow CH_3F+AgBr$	(s) Sandmeyer's reaction

    (a) A-(q), B-(s), C-(p), D-(r)
    (b) A-(q), B-(r), C-(p), D-(s)
    (c) A-(r), B-(p), C-(s), D-(q)
    (d) A-(s), B-(r), C-(p), D-(q)

60. **Assertion:** Alkylbenzene is not prepared by Friedel-Crafts alkylation of benzene.
    Reason: Alkyl halides are less reactive than acyl halides.
    (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion
    (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion
    (c) Assertion is correct, reason is incorrect
    (d) Assertion is incorrect, reason is correct

61. Under certain conditions an alkyl halide reacts with base to give an alkene and HCl [Elimination Reaction] for example
    R-CH_2-CH_2-$Cl \rightarrow R$-$CH = CH_2 + HCl$
    The extent of these reactions depends on the structure of alkyl halides (e.g. primary, secondary or tertiary). The relative extent to which such reactions take place is in the order (of haloalkanes) :
    (a) Primary < secondary < Tertiary
    (b) Primary > Secondary > Tertiary
    (c) Primary > Secondary < Tertiary
    (d) Primary < Secondary > Tertiary

62. The replacement of chlorine of chlorobenzene to give phenol requires drastic conditions, but the chlorine of 2, 4-dinitrochlorobenzene is readily replaced since.
    (a) nitro groups make the aromatic ring electron rich at ortho/para positions
    (b) nitro groups withdraw electrons from the meta position of the aromatic ring
    (c) nitro groups donate electrons at meta position
    (d) nitro groups withdraw electrons from ortho/para positions of the aromatic ring

63. Among the following series of transition metal ions, the one where all metal ions have $3d^2$ electronic configuration is
    (At. nos. Ti = 22; V = 23; Cr = 24; Mn = 25)
    (a) $Ti^{3+}, V^{2+}, Cr^{3+}, Mn^{4+}$ (b) $Ti^{+}, V^{4+}, Cr^{6+}, Mn^{7+}$
    (c) $Ti^{4+}, V^{3+}, Cr^{2+}, Mn^{3+}$ (b) $Ti^{2+}, V^{3+}, Cr^{4+}, Mn^{5+}$

64. Which one of the following transition metal ions shows magnetic moment of 5.92 BM?
    (a) Mn^{2+}　　(b) Ti^{3+}　　　(c) Cr^{3+}　　(d) Cu^{2+}

65. In the following salts the lowest value of magnetic moment is observed in
    (a) $MnSO_4.4H_2O$　　　　(b) $CuSO_4.5H_2O$
    (c) $FeSO_4.6H_2O$　　　　(d) $ZnSO_4.7H_2O$

66. Cuprous ion is colourless while cupric ion is coloured because
    (a) both have half filled p-and d-orbitals
    (b) cuprous ion has incomplete d-orbital and cupric ion has a complete d-orbital
    (c) both have unpaired electrons in the d-orbitals
    (d) cuprous ion has complete d-orbital and cupric ion has an in complete d-orbital.

67. Acidified $K_2Cr_2O_7$ solution turns green when Na_2SO_3 is added to it. This is due to the formation of:
    (a) $Cr_2(SO_4)_3$　　　　　(b) CrO_4^{2-}
    (c) $Cr_2(SO_3)_3$　　　　　(d) $CrSO_4$

68. Which one of the following is an amphoteric oxide?
    (i) Mn_2O_7　(ii) CrO　　(iii) V_2O_4　(iv) Cr_2O_3
    (a) (i) and (ii)　　　　(b) (ii), (iii), and (iv)
    (c) (iii), and (iv)　　　(d) (ii) and (iv)

69. When a small amount of $KMnO_4$ is added to concentrated H_2SO_4, a green oily compound is obtained which is highly explosive in nature. Compound may be
    (a) $MnSO_4$　　　　　　(b) Mn_2O_7
    (c) MnO_2　　　　　　(d) Mn_2O_3

70. Arrange the following increasing order of acidic character? Mn_2O_7(A), Mn_2O_3(B), MnO(C)?
    (a) C, A, B　　　　　　(b) A, C, B
    (c) B, A, C　　　　　　(d) C, B, A

71. The +3 ion of which one of the following has half filled 4f subshell?
    (a) La　　(b) Lu　　(c) Gd　　　(d) Ac

72. The rate law for the single-step reaction $2A + B \rightarrow 2C.$ is given by :
    (a) rate = k [A].[B]　　　(b) rate = k $[A]^2$.[B]
    (c) rate = k [2A]. [B]　　(d) rate = $k[A]^2 .[B]^0$

73. Order of reaction is decided by
    (a) temperature
    (b) mechanism of reaction as well as relative concentration of reactants
    (c) molecularity
    (d) pressure

74. The rate law for a reaction between the substance A and B is given by Rate = k $[A]^n$ $[B]^m$
    On doubling the concentration of A and halving the concentration of B, the ratio of the new rate to the earlier rate of the reaction will be as
    (a) $(m+n)$　　　　　(b) $(n-m)$
    (c) $2^{(n-m)}$　　　　(d) $\dfrac{1}{2^{(m+n)}}$

75. In the reaction $2A + B \rightarrow A_2B,$ if the concentration of A is doubled and that of B is halved, then the rate of reaction will:
    (a) increase 2 times　　(b) increase 4 times
    (c) decrease 2 times　　(d) remain the same

76. The unit of rate constant for a zero order reaction is
    (a) mol $L^{-1}s^{-1}$　　　　(b) L mol^{-1} s^{-1}
    (c) L^2 mol^{-2} s^{-1}　　　　(d) s^{-1}

77. The chemical reaction $2O_3 \rightarrow 3O_2$ proceeds as follows :
    $O_3 \xrightarrow{Fast} O_2 + O;$
    $O + O_3 \xrightarrow{Slow} 2O_2$　　the rate law expression should be
    (a) r = k[O_3]^2　　　　　(b) r = k[O_3]^2[O_2]^{-1}
    (c) r = k^3 [O_3] [O_2]^2　　(d) r = [O_3][O_2]^2

78. A reaction proceeds by first order, 75% of this reaction was completed in 32 min. The time required for 50% completion is
    (a) 8 min　　　　　(b) 16 min
    (c) 20 min　　　　　(d) 24 min

79. Consider the reaction, 2A + B $\rightarrow$ products. When concentration of B alone was doubled, the half-life did not change. When the concentration of A alone was doubled, the rate increased by two times. The unit of rate constant for this reactions is
    (a) s^{-1}　　　　　(b) L mol^{-1} s^{-1}
    (c) no unit　　　　(d) mol L^{-1} s^{-1}.

80. A reaction having equal energies of activation for forward and reverse reaction has :
    (a) $\Delta G = 0$　　　　　　(b) $\Delta H = 0$
    (c) $\Delta H = \Delta G = \Delta S = 0$　　(d) $\Delta S = 0$

81. If the activation energy for the forward reaction is 150 kJ mol^{-1} and that of the reverse reaction is 260 kJ mol^{-1}, what is the enthalpy change for the reaction?
    (a) 410 kJ mol^{-1}　　　　(b) -110 kJ mol^{-1}
    (c) 110 kJ mol^{-1}　　　　(d) -410 kJ mol^{-1}

82. Rate of reaction can be expressed by Arrhenius equation as : $k = Ae^{-E_a/RT}$
    In this equation, E_a represents
    (a) the total energy of the reacting molecules at a temperature, T
    (b) the fraction of molecules with energy greater than the activation energy of the reaction
    (c) the energy below which all the colliding molecules will react
    (d) the energy below which colliding molecules will not react

83. A catalyst
    (a) increases the rate of reaction by decreasing ΔG of a reaction.
    (b) increases the rate of reaction by increasing ΔG of a reaction.
    (c) increases the rate of reaction by decreasing activation energy of the forward reaction.
    (d) increases the rate of reaction by providing an alternative pathway via an intermediate with lower activation energy.

84. The rate of the reaction $2N_2O_5 \rightarrow 4NO_2 + O_2$ can be written in three ways :
    $$\frac{-d[N_2O_5]}{dt} = k[N_2O_5] \qquad \frac{d[NO_2]}{dt} = k'\,[N_2O_5]$$
    $$\frac{d[O_2]}{dt} = k''\,[N_2O_5]$$
    The relationship between k and k′ and between k and k″
    (a) $k' = 2k$; $k' = k$　　　(b) $k' = 2k$; $k'' = k/2$
    (c) $k' = 2k$; $k'' = 2k$　　(d) $k' = k$; $k'' = k$

85. Total number of isomeric alcohols with formula $C_4H_{10}O$ are :
    (a) 1　　　(b) 2　　　(c) 3　　　(d) 4

SECTION – B

86. 2-Methylbutane on reacting with bromine in the presence of sunlight gives mainly
    (a) 1-bromo-3-methylbutane
    (b) 2-bromo-3-methylbutane
    (c) 2-bromo-2-methylbutane
    (d) 1-bromo-2-methylbutane

87. When hydrochloric acid gas is treated with propene in presence of benzoyl peroxide, it gives
    (a) 2-Chloropropane　　(b) Allyl chloride
    (c) No reaction　　　　(d) n-Propyl chloride

88. "The addition of unsymmetrical reagents to unsymmetrical alkenes occurs in such a way that the negative part of the addendum goes to that carbon atom of the double bond which carries lesser number of hydrogen atoms" is called by :
    (a) Saytzeff rule　　　(b) Markownikoffs rule
    (c) Kharasch effect　　(d) Anti-Saytzeff rule

89. But-2-yne on chlorination gives
    (a) 1-chlorobutane
    (b) 1, 2-dichlorobutane
    (c) 1, 1, 2, 2- tetrachlorobutane
    (d) 2, 2, 3, 3-tetrachlorobutane

90. Which of the following reactions will yield 2, 2-dibromopropane ?
    (a) $HC \equiv CH + 2HBr \rightarrow$
    (b) $CH_3C \equiv CH + 2HBr \rightarrow$
    (c) $CH_3CH = CH_2 + HBr \rightarrow$
    (d) $CH_3CH = CHBr + HBr \rightarrow$

91. The conditions for aromaticity is :
    (a) molecule must have cyclic clouds of delocalized π electrons
    (b) molecule must contain $(4n + 2)$ π electrons
    (c) both (a) and (b)
    (d) None of the above

92. In a reaction of C_6H_5 Y, the major product (> 60%) is m-isomer, so the group Y is
    (a) –COOH　(b) –NH$_2$　(c) –OH　　(d) –Cl

93. In the following reaction, how is the rate of appearance of underlined product related to the rate of disappearance of the underlined reactant?
    $BrO_3^-\ (aq) + 5Br^-(aq) + 6H^+ \rightarrow 3\underline{Br_2}(l) + 3H_2O(l)$
    (a) $\dfrac{d[Br_2]}{dt} = -\dfrac{d[Br^-]}{dt}$　　(b) $\dfrac{d[Br_2]}{dt} = +\dfrac{3}{5}\dfrac{d[Br^-]}{dt}$
    (c) $\dfrac{d[Br_2]}{dt} = -\dfrac{3}{5}\dfrac{d[Br^-]}{dt}$　　(d) $\dfrac{d[Br_2]}{dt} = -\dfrac{5}{3}\dfrac{d[Br^-]}{dt}$

94. Match the columns

Column I	Column II
(A) Alkyl halide in presence of dry ether	(p) Sulphonation
(B) Arene + Acid halide In presence of $AlCl_3$	(q) Wurtz reaction
(C) Arene + Fuming Sulphuric in presence of $AlCl_3$	(r) Catalytic
(D) Arene+Hydrogen in presence of Ni	(s) Friedel-Crafts reaction

(a) A-(p), B-(r), C-(q), D-(s)
(b) A-(s), B-(q), C-(r), D-(p)
(c) A-(r), B-(p), C-(s), D-(q)
(d) A-(q), B-(s), C-(p), D-(r)

95. The decreasing order boiling points of alkyl halides is
(a) RF > RCl > RBr > RI
(b) RBr > RCl > RI > RF
(c) RI > RBr > RCl > RF
(d) RCl > RF > RI > RBr

96. Aryl halides are extremely less reactive towards nucleophilic substitution than alkylhalides. Which of the following accounts for this ?
(i) Due to resonance in aryl halides.
(ii) In alkyl halides carbon atom in C-X bond is sp^2 hydridised whereas in aryl halides carbon atom in C-X bond is sp^3 hybridized.
(iii) Due to stability of phenyl cation.
(iv) Due to possible repulsion there are less chances of nucleophile to approach electron rich arenes.
(a) (i), (ii) and (iv)   (b) (i), (ii) and (iii)
(c) (i) and (iv)   (d) (ii), (iii) and (iv)

97. CCl_4 is well known fire extinguisher. However after using it to extinguish fire, the room should be well ventilated. This is because
(a) It is flammable at higher temperatures
(b) It is toxic
(c) It produces phosgene by reaction with water vapour at higher temperatures
(d) It is corrosive

98. Choose correct option based on following statement. Here T stands for true statement and F for false statement.
(i) Molecularity is defined as the number of reacting species taking part in a complex reaction,
(ii) Molecularity helps in understanding the mechanism of reaction.
(iii) Reactions with the molecularity three are very rare and slow to proceed.
(iv) Complex reactions involving more than three molecules take place in more than one step.
(a) TTTF   (b) TFTF   (c) FTTF   (d) FTTT

99. According to collision theory, not all collisions between molecules lead to reaction. Which of the following statements provide reasons for the same?
(i) The total energy of the two colliding molecules is less than some minimum amount of energy.
(ii) Molecules cannot react with each other unless a catalyst is present.
(iii) Molecules that are improperly oriented during collision will not react.
(iv) Molecules in different states of matter cannot react with each other.
(a) (i) and (ii)   (b) (i) and (iii)
(c) (ii) and (iii)   (d) (i) and (iv)

100. For a first order reaction $A \rightarrow P$, the temperature (T) dependent rate constant (k) was found to follow the equation log k = (2000) $\frac{1}{T} + 6.0$. The pre-exponential factor A and the activation energy E_a, respectively, are
(a) $1.0 \times 10^6 s^{-1}$ and 9.2 kJ mol^{-1}
(b) 6.0 s^{-1} and 16.6 kJ mol^{-1}
(c) $1.0 \times 10^6 s^{-1}$ and 16.6 kJ mol^{-1}
(d) $1.0 \times 10^6 s^{-1}$ and 38.3 kJ mol^{-1}

BOTANY
SECTION – A

101. All are the major reasons of global warming **except**
(a) Use of fossil fuels
(b) Reforestation
(c) Enhancing carbon dioxide production
(d) Deforestation

102. Which of the following gas is a major contributor of the greenhouse effect in quantitative terms after CO_2?
(a) CFCs   (b) N_2O (c) CH_4 (d) SO_2

103. In India, Water (Prevention and Control of Pollution) Act, came into force in
(a) 1982   (b) 1975   (c) 1992   (d) 1974

104. In wastewater from domestic sewage, impurities are
(a) Less than 0.01%
(b) Mere 0.1%
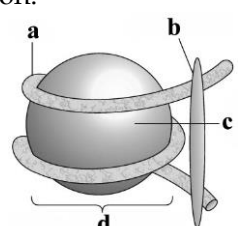(c) Present in 1-5% generally
(d) Present approximately 10-20%

105. Dissolved oxygen is very high in
 (a) A pond near the city
 (b) A polluted lake
 (c) A fresh water river
 (d) A lake with high BOD

106. Which of the following is **not** true for Terror of Bengal?
 (a) Generally grow in polluted water bodies
 (b) Cannot be removed easily from water bodies
 (c) Generally not found in eutrophic water bodies
 (d) An alien species for India

107. All the following are true for eutrophication **except**
 (a) It is a natural aging of lake by nutrient enrichment
 (b) As the lake's fertility increases, plant and animal life burgeons
 (c) Over the centuries, as silt and organic debris pile up, the lake grows shallower and warmer
 (d) Eutrophication can be stopped by adding phosphates and nitrates

108. Ramesh Chandra Dagar is famous for
 (a) Water pollution control
 (b) Recycled plastic named as polyblend
 (c) e-waste control
 (d) Organic farming

109. Bad ozone is present in
 (a) Troposphere   (b) Stratosphere
 (c) Ionosphere   (d) Mesosphere

110. Which of the following is an effect of UV-B rays?
 (a) Skin cancer
 (b) Various types of blood cancer
 (c) Cataract
 (d) Both (a) and (c)

111. Dobson unit is a measurement unit of
 (a) Sound intensity
 (b) Thickness of ozone
 (c) UV-B light
 (d) CFCs present in atmosphere

112. National Forest Policy of India has recommended 33% forest cover for the plains, but India has___A___of forest by the end of twentieth century.
 Here A is
 (a) 21.54%   (b) 10%
 (c) 30%   (d) 12.54%

113. Montreal protocol was signed in Canada in
 (a) 1989   (b) 1988   (c) 1987   (d) 1986

114. Euro III norms stipulate that sulphur to be controlled at _____ parts-per-million (ppm) in petrol.
 (a) 150   (b) 750   (c) 1000   (d) 500

115. Catalytic converters
 (a) Are used in exhaust of vehicles
 (b) Remove most of the gases from exhaust of thermal plant
 (c) Are used in sewage treatment plant
 (d) Both (a) and (c)

116. In India, the Air (Prevention and Control of Pollution) Act was amended in _____ to include noise as an air pollutant
 (a) 1982   (b) 1975   (c) 1992   (d) 1987

117. FOAM stands for
 (a) Forum of Arcata Marshes
 (b) Friends of Arcata Marshes
 (c) Forest of Arcata Marshes
 (d) Findings of Arcata Marshes

118. CNG is better fuel than diesel or petrol because
 (a) It remains unburnt during combustion
 (b) Can be siphoned off by thieves
 (c) CNG cannot be adulterated and burns efficiently
 (d) It can be distributed very easily via pipeline

119. Plant which is known as Terror of Bengal
 (a) Generally grows in fresh water bodies
 (b) Maintains balance in the ecosystem dynamics of water body
 (c) Grows abundantly in eutrophic water bodies
 (d) Is a native plant of India

120. Ahmad khan is famous for
 (a) Water pollution control
 (b) Recycled plastic named as polyblend
 (c) e-waste control
 (d) Organic farming

121. During the past century, the temperature of Earth has increased by around
 (a) 2^0C (b) 3^0C (c) 1^0C (d) 0.6^0C

122. Which of the following is not a direct effect of UV-B rays?
 (a) Aging of skin
 (b) Various type of blood cancer
 (c) Inflammation of cornea
 (d) Cataract

123. Select the mismatched pair
   (a) Chipko Movement – Started in Garhwal Himalayas
   (b) Joint forest management – Started by the government of India in 1980
   (c) Methane – Contributes maximum to total global warming
   (d) El Nino effect – An effect of global warming

124. Haryana Kisan Welfare Club, with a current membership of 5000 farmers, was created by
   (a) Ramesh Chandra Dagar
   (b) Amrita Devi
   (c) Ahmed Khan
   (d) Govt. of India

125. Electrostatic precipitator
   (a) Is used in exhaust of vehicles
   (b) Removes most of the gases from exhaust of motor vehicles
   (c) Is used in exhaust of thermal plant
   (d) Both (a) and (c)

126. High concentration of phosphorus and nitrates in a water body
   (a) Can lead to biomagnifications
   (b) Can lead to eutrophication
   (c) Can favor the growth of such bacteria which are responsible for algal bloom
   (d) Both (b) and (c)

127. Consider the following statements regarding EcoSan toilets.
   (A) Uses water to dispose of human excreta.
   (B) Recycles human excreta as a natural fertilizer.
   (C) This is a hygienic and efficient solution of human waste disposal.
   (D) It is not a cost effective and practical solution.
   The **correct** statements are
   (a) (A) and (D)   (b) (B) and (C)
   (c) (B) and (D)   (d) (A) and (C)

128. Select the **incorrect** statement w.r.t. biomagnification.
   (a) The phenomenon is well-known for accumulation of mercury and DDT
   (b) Occurs w.r.t. non-biodegradable substances which does not metabolised or excreted and are passed to next trophic level
   (c) Causes natural ageing of lakes by enrichment of nutrients
   (d) Refers to increase in concentration of a toxicant at successive trophic level

129. Greenhouse gases absorb a major fraction of a form of radiations re-emitted by earth surface which are
   (a) UV-radiations
   (b) Infrared radiations
   (c) Shortwave radiations
   (d) Photosynthetically active radiations

130. For laying roads, polyblend is mixed with
   (a) Benzene hexachloride   (b) Bitumen
   (c) Polyethene   (d) PVC

131. Choose the odd one w.r.t. carries of male gametes:
   (a) Gymnosperms and angiosperms
   (b) Algae
   (c) Bryophytes
   (d) Pteridophytes

132. Plants obtained through vegetative propagation are
   (a) Better adapted to changing environment
   (b) Do not get easily decayed
   (c) Shows genetic uniformity
   (d) Could not be transgenic

133. Arrange the following w.r.t. increasing life span: Rose, Fruit fly, Rice
   (a) Fruit fly, Rice, Rose
   (b) Rose, Rice, Fruit fly
   (c) Rice, Rose, Fruit fly
   (d) Fruit fly, Rose, Rice

134. Parameters of old age are?
   (a) End of reproductive phase
   (b) Concomitant changes in our body
   (c) Slowing down of vital processes
   (d) All of the above

135. What is the main aim of animal breeding in animal husbandry:
   (a) Increasing the yield of animals
   (b) Increasing the number of animals
   (c) Improving the desirable qualities of the produce
   (d) Both (a) and (c)

SECTION – B

136. How many fishes in the list given below are marine?
   Catla, Pomfret, Common carp, Hilsa, Rohu, Mackerel, Sardine
   (a) Six   (b) Three   (c) Four   (d) Five

137. Resistance to yellow mosaic virus and powdery mildew in mungbean is developed by which method?
(a) Tissue culture
(b) Somatic hybridisation
(c) Genetic engineering
(d) Mutation breeding

138. Choose incorrect statement:
(a) SCP is one of the alternate source of proteins for animals and human nutrition
(b) Microbes because of their high rate of biomass production and growth can produces large amounts of proteins
(c) *Spirulina* can use as food rich in protein but not in minerals, fats, carbohydrate and vitamins
(d) Microbial growth on starch, straw, molasses, sewage also reduces environmental pollution

139. In a fertilised embryo sac, the haploid, diploid and triploid structures are
(a) Synergid, zygote and primary endosperm, nucleus
(b) Synergid, antipodal and polar nuclei
(c) Antipodal, synergid and primary endosperm nucleus
(d) Synergid, polar nuclei and zygote

140. Autogamy can occur in a chasmogamous flower if
(a) Pollen matures before maturity of ovule
(b) Ovules mature before maturity of pollen
(c) Both pollen and ovules matuer simultaneoulsy
(d) Both anther and stigma are of equal lengths

141. Emasculated :
(a) Nitrocellulose   (b) Polythene
(c) Butter paper   (d) All of the above

142. **Statement A:** Pollen grains of some plants remain viable for months.
Statement B: Double fertilization is absent where pollen is shed in 2-celled stage.
(a) Statement B is correct and statement A is wrong
(b) Both the statement A and B are correct
(c) Statement A is correct and statement B is wrong
(d) Both the statement A and B are wrong

143. About genotype Rr, select out incorrect statement:
(a) Allelic gene pair
(b) They control common character
(c) They share common locus
(d) Can be present on non−homologous chromosome

144. How many different kinds of gametes will be produced by a plant having genotype AABbCCdd?
(a) 16   (b) 32   (c) 4   (d) 2

145. Blue eye colour is recessive to brown eye colour. A brown eye man whose mother was blue eye marries a blue-eye women. The children shall be
(a) Both blue eye and brown eye 1 : 1
(b) All brown eye
(c) All blue eye
(d) Blue eye and brown eye 3 : 1

146. Genetic variation in a population arises due to
(a) Mutations only
(b) Recombination only
(c) Mutations as well as recombination
(d) Reproductive isolation and selection

147. If the base sequnece of a codon in mRNA is 5′-AUG-3′, the sequence of tRNA pairing with it must be
(a) 5′-UAC-3′   (b) 5′-CAU-3′
(c) 5′-AUG-3′   (d) 5′-GUA-3′

148. Recognise the figure given below and select the correct option:

(a) b-H_1 histone, c-Histone octamer, a-DNA, d-core of histone molecules
(b) c-H_1 histone, b-Histone octamer, d-DNA, a-Core of histone octamer
(c) a-H_1 histone, c-Histone octamer, b-DNA, d-Core of histone octamer
(d) b-H_1 histone, d-Histone octamer, c-DNA, a-Core of histone molecules

149. The transforming principle of Pneumococcus as find out by Avery, MacLeod and McCarty was
(a) mRNA   (b) DNA
(c) Protein   (d) Polysaccharide

150. Sequence of nitrogen bases in non-template strand of DNA was found to be CAT GTT TAT CGC. What would be sequence of nitrogen bases in RNA synthesised over the corresponding in region of template strand?
   (a) CAU GUU UAU CGC
   (b) CAA GAA TAU GCC
   (c) GUA CAA AUA GCC
   (d) GTA CAA ATA GCC

ZOOLOGY
SECTION – A

151. Which of the following is considered a hot-spot of biodiversity in India ?
   (a) Indo-Gangetic Plain   (b) Eastern Ghats
   (c) Aravalli Hills   (d) Western Ghats

152. Which one of the following ecosystem types has the highest annual net primary productivity?
   (a) Tropical deciduous forest
   (b) Temperate evergreen forest
   (c) Temperate deciduous forest
   (d) Tropical rain forest

154. The technique called Gamete Intrafallopian Transfer (GIFT) is recommended for those females
   (a) who cannot produce an ovum.
   (b) who cannot retain the foetus inside uterus.
   (c) whose cervical canal is too narrow to allow passage for the sperms.
   (d) who cannot provide suitable environment for fertilization.

153. Which one of the following statements about Human sperm is correct?
   (a) Acrosome has a conical pointed structure used for piercing and penetrating the egg, resulting in fertilisation.
   (b) The sperm lysins in the acrosome dissolve the egg envelope facilitating fertilisation.
   (c) Acrosome serves as a sensory structure leading the sperm towards the ovum.
   (d) Acrosome serves no particular function.

155. The following graph is of relative concentrations of the four hormones present in the blood plasma of a woman during her menstrual cycle. Identify the hormones.
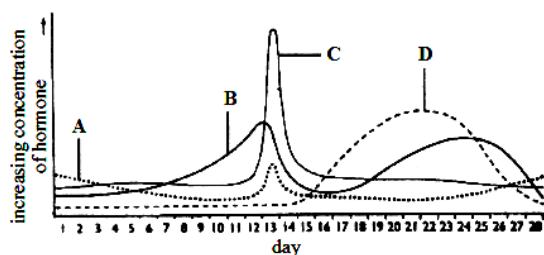

	A	B	C	D
(a)	FSH	Progesterone	LH	Oestrogen
(b)	LH	Progesterone	FSH	Oestrogen
(c)	FSH	Oestrogen	LH	Progesterone
(d)	LH	Oestrogen	FSH	Progesterone

156. The chemical method of contraception includes
   (a) jellies only
   (b) creams and foams only
   (c) oral contraceptives only
   (d) all of the above

157. Which one of the following is an example of Ex-situ conservation?
   (a) Wildlife sanctuary   (b) Seed bank
   (c) Sacred groves   (d) National park

158. The figure shows a section of human ovary. Select the option which gives the correct identification of A and B with function/characteristic:
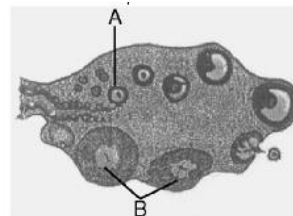

   (a) A – Primary oocyte – it is the prophase – I of the meiotic division
   (b) B – Corpus luteum – secretes progesterone
   (c) A – Tertiary follicle – forms Graafian follicle
   (d) B – Corpus luteum – secretes estrogen

159. If both parents are carriers for thalassemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?
   (a) 50%   (b) 25%   (c) 100% (d) no chance

160. What does the shape of the given age pyramids (I to III) reflect about the growth status of populations?
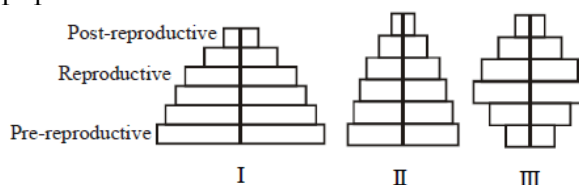
|	I	II	III
(a)	Declining	Stable	Expanding
(b)	Stable	Expanding	Declining
(c)	Expanding	Stable	Declining
(d)	Declining	Expanding	Stable

161. If a colour blind woman marries a normal visioned man, their sons will be
    (a) one-half colour blind and one-half normal
    (b) three-fourths colour blind and one-fourth normal
    (c) all colour blind sons
    (d) all normal visioned

162. Progestasert and LNG-20 are
    (a) Implants
    (b) Copper releasing IUDs
    (c) Non-medicated IUDs
    (d) Hormone releasing IUDs

163. A normal- visioned man whose father was colour blind, marries a woman whose father was also colour blind. They have their first child as a daughter. What are the chances that this child would be colour blind ?
    (a) 100%   (b) zero percent
    (c) 25%   (d) 50%

164. Read the following statements and find out the incorrect statement(s)
    (A) The universe is almost 20 million years old.
    (B) Huge clusters of galavies comprise the universe.
    (C) Galaxies contain stars and clouds of gas and dust.
    (E) Considering the size of earth, universe is indeed a speck.
    (E) Big band theory attempts to explain the origin of univers.
    (a) A, B and C   (b) B and C
    (c) A and D   (d) only A

165. Chemical theory for origin of life was given by.
    (a) Stanley miller
    (b) Oparin and Haldane
    (c) Spallanzani
    (d) Louis Pasteur

166. Which of the following amino acids was not found to be synthesized in Miller's experiment?
    (a) Alanine   (b) Glycine
    (c) Aspartic acid   (d) Glutamic acid

167. Gaseous mixture used by Miller for synthesis of amino acids through heat and electric discharge included
    (a) Methane, ammonia, hydrogen and water vapours
    (b) Methane, ammonia, nitrogen and water vapours
    (c) Nitrogen, methane, oxygen and water
    (d) Ammonia, carbon dioxide, nitrogen and water vapours

168. Recognise the figure and find out the correct matching.
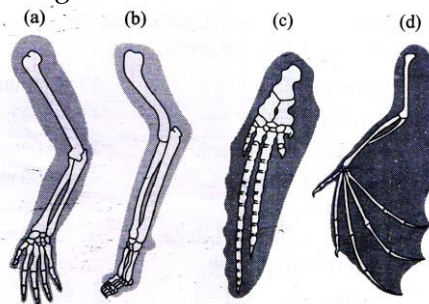
    (a) A – man, B – whale, C – cheetah, D – bat
    (b) A – man, C – whale, B – cheetah, D – bat
    (c) A – man, D – whale, C – cheetah, B – bat
    (d) B – man, C – whale, A – cheetah, D – bat

169. Recognise the figure and find out the correct matching.
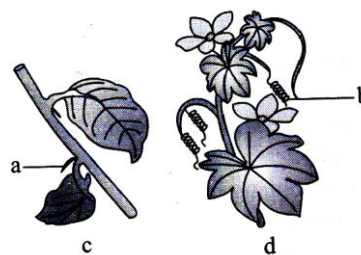
    (a) A – tendril, B – thorm, C – *Cucurbia*, D – *Bougainvillea*
    (b) B – tendril, A – thorn, D – *Cucurbia*, C – *Bougainvillea*
    (c) A – tendril, B – thorn,D – *Cucurbia*, C – *Bougainvillea*
    (d) B – tentril, A – thorn, C – *Cucurbia*, D – *Bougainvillea*

170. Which one provides direct and solid evidence in favour of organic evolution through ages?
    (a) Atavism
    (b) Paleontology/fossils
    (c) Vestigial organs
    (d) Galapagos island fauna

171. Match the column – I and II, and choose the correct combination from the option given.

	Column – I		Column – II
(a)	Invertebrates evolved	1.	65 mya
(b)	Sea weeds and few plants evolved	2.	200 mya
(c)	Jaw fishes evolved	3.	320 mya
(d)	Fish like reptiles evolved	4.	350 mya

172. Recognise the figure and find out the correct matching.
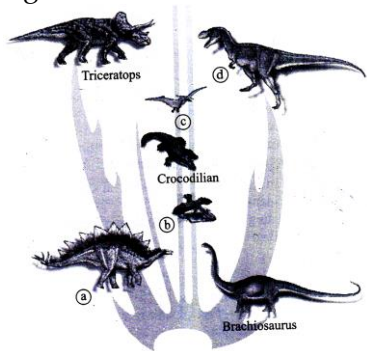
(a) A – *Archaoeopteryx*, B – *Tyrannosaurs*, C – *Stegosaurs*, D - *Pteranodon*
(b) D – *Archaeopteryx*, C – *Tyrannosaurs*, A – *Stegosaurs*, B – *Pteranodon*
(c) C – *Archaeopteryx*, D – *Tyrannosaurs*, B – *Stegosaurs*, A – *Pteranodon*
(d) B – *Archaeopteryx*, D – *Tyrannosaurs*, B – *Stegosaurs*, C – *Pteranodon*

173. The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography (habitats) in called..
(a) Adaptive convergence
(b) Adaptive radiation
(c) Natural selection
(d) Convergent evolution

174. According to Darwin, diversity as found in Australian marsupials is due to.
(a) Convergent evolution
(b) Adaptive radiation
(c) Parallel radiation
(d) Parallel evolution

175. Fill in the blanks according to the convergent evolution.

Anteater	……..a……….
……b……..	Spotted cuscus
Flying squired	……..c………
……..d……..	Tasmanian tiger cat

(a) C – flying phalanger, B – lemur, D – bobcat, A – Number
(b) B – flying phalanger, A – lemur, C – bobcat, D – Number
(c) C – flying phalanger, A – lemur, D – bobcat, B – Number
(d) D – flying phalanger, B – lemur, C – bobcat, A – Numbat

176. Tasmanian Wolf is a marsupial while Wolf is a placental mammal. This shows,
(a) Convergent evolution
(b) Divergent evolution
(c) Prallelism
(d) Inheritance of acquired characters

177. Recognise the figure and find out the correct matching.
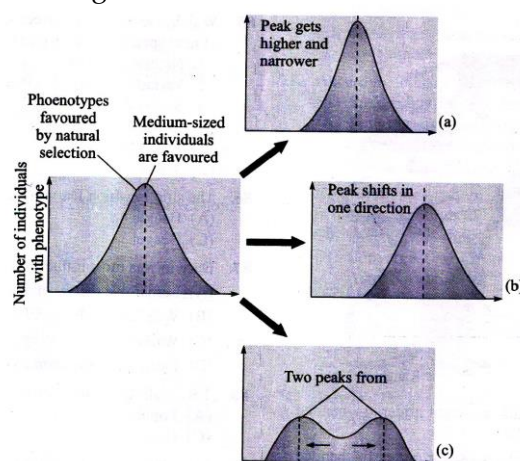
(a) B – directional, A – disruption, C – stabilization
(b) B – directional, C – disruption, A – stabilization
(c) C – directional, B – disruption, A – stabilization
(d) A – directional, C – disruption, B – stabilization

178. What is correct formulation of Heady Weinberg law?
(a) $p^2 + 2pq + q^2 = 1$ (b) $p^2 = pq + q^2 = 1$
(c) $p^2 + 2pq + q^2 = 0$ (d) $p^2 + pq + q^2 = 0$

179. Hardy – Weinberg equilibrium is influenced by gene flow, genetic drift, mutation, genetic recombination and.
(a) Evolution   (b) Limiting factor
(c) Over – production   (d) Natural selection

180. Dinosaurs disappeared during.
(a) Jurassic   (b) Triassic
(c) Cretaceous   (d) Permian

181. Which was the biggest land dinosaur?
(a) *Protoceratops*   (b) *Apatosaurus*
(c) *Tyrannosaurus rex*   (d) *Ichthyosaurus*

182. Select the correct statement.
(a) Darwinian variation are small and directionless
(b) Mutation are random and directional
(c) Fitness is the end result of the ability to adapt and get selected by nature
(d) All mammals excess whales and camels have seven cervical vertebrae.

183. Single step large mutation leading to speciation is.
(a) Founder effect
(b) Adaptive radiation
(c) Saltation
(d) Natural selection

184. Two species of different geneology show resemblance due to similar adaptation. The phenomenon is.
    (a) Convergent evolution
    (b) Divergent evolution
    (c) Micro – evolution
    (d) Co – evolution

185. Match the pair of items with the category of organs.
    (a) Nephridia of Earthworm and Malpighian tubules of Cockroach – Excretory organ
    (b) Wings of Honey Bee and Crow – Homologous organs
    (c) Nictitating membrane and blind spot in human eye – Vestigial organs
    (d) Thorms of Bougainvillea and tendrils of Cucurbita – Analogous organs

SECTION – B

186. "Struggle for existence and survival of the fittest" is associated with.
    (a) Lamarckism   (b) Mendelism
    (c) Darwinism   (d) Neo Lamarckism

187. The term living fossil refers to a
    (a) life like fossil well preserved in amber.
    (b) fossil formed from a living animal.
    (c) living animal which is about to the fossilized.
    (d) living organisation showing some very primitive characters.

188. Find out the pairs, which are correctly matched.

	Column – I		Column - II
A.	PCR	I.	Large scale culture
B.	Bioreactor	II.	To induce alien DNA in host cell
C.	Gene gun	III.	Restriction endonuclease
D.	Eco RI	IV.	Amplification of gene

    (a) A → (IV); B → (I); C→ (II); D → (III)
    (b) A → (II); B → (I); C → (IV); D → (III)
    (c) A → (IV); B → (I); C → (III); D → (II)
    (d) A → (I); B → (IV); C → (II); D → (III)

189. At which stage of HIV infection does one usually show symptoms of AIDS?
    (a) When the infecting retrovirus enters host cells.
    (b) When viral DNA is produced by reverse trancriptase.
    (c) When HIV replicates rapidly in helper T-lymphocytes and damages large number of these cells.
   (d) Within 15 day of sexual contact with an infected person

190. The finches of Galapagos islands provide an evidence in favour of
    (a) evolution due to mutation
    (b) retrogressive evolution
    (c) biogeographical evolution
    (d) special creation

191. According to Darwin, two different areas within a continent have different species because they have different
    (a) evolutionary mechanisms
    (b) ancestors
    (c) environments
    (d) evolutionary times

192. One of the important consequences of geographical isolation is
    (a) random creation of new species.
    (b) no change in the isolated fauna.
    (c) preventing speciation.
    (d) speciation through reproductive isolation.

193. Match the column I and II, and choose the correct combination from the options given.

	Column – I		Column – II
(A)	Origin of earth	1.	4500 mya
(B)	Origin of life on earth	2.	4000 mya
(C)	Origin of first cellular form of life on earth	3.	3000 mya
(D)	Origin of first non cellular form of life on earth	4.	2000 mya

    (a) A – 1, B – 2, C – 3, D – 4
    (b) A – 2, B – 1, C – 4, D – 3
    (c) A – 1, B – 2, C – 4, D – 3
    (d) A – 2, B – 1, C – 3, D – 4

194. Choose the wrong statements regarding Hardy – Weinberg principle.
    (a) Sum total of all the allelic frequencies in a population is 1.
    (b) Variation due to genetic drift results in changed frequency of genes and alleles in future generations.
    (c) Natural selection can lead to stabilization, directional change or disruption.
    (d) Genetic recombination helps in maintaining Hardy – Weinberg equilibrium.

195. Recognise the figure and find out the correct matching.
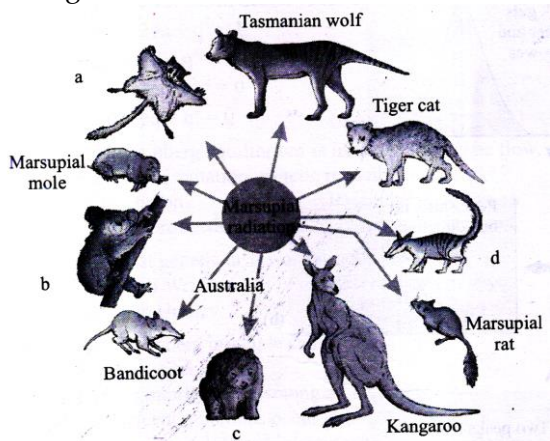
(a) C – wombat, B – koala, A – sugar glider, D – banded anteater
(b) A – wombat, C – koala, D – sugar glider, B – banded
(c) B – wombat, D – koala, C – sugar glider, A – banded
(d) D – wombat, A – koala, B – sugar glider, C – banded anteater

196. Read the statements (i – iv) and choose the correct option.
i. Increase in melanised moths after inducstrilization in Great Britian is a poor of Natural Selection.
ii. More individuals acquiring mean character value cause disruption
iii. Change in allelic frequency leads to Hardy – Weinberg equilibrium
iv. Genetic drift changes allelic frequency in future generations.
(a) ii is correct　　　　(b) i is correct
(c) i and iv are correct　(d) i and iii are correct

197. Recognise the figure and find out the correct matching.
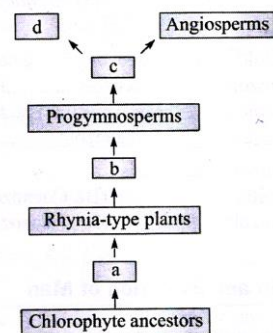
(a) a – psilophyton, b – tracheophyte ancestors, c – cycads, d – conifers
(b) a – tracheophyte ancestors, b – psilophytons, c – seed ferns, d – cycads
(c) a – psilophyton, b – tracheophyte ancestors, c – seed ferns, d – cycads
(d) a – tracheophyte ancestors, b – psilophyton, c – cycads, d – seed ferns

198. Correct sequence of stages in evolution of Modern Man/Homo sapiens is.
(a) *Australopithecus*, Neanderthal Man, Cro – Magnon Man, *Homo erectus*, Maodern Man
(b) *Australopithecus*, *Homo erectus*, Neanderthal Man, Cro – Magnon Man, Modern Man
(c) Neanderthal Man, *Australopithecus*, Cro – Magnon Man, *Hoco erectus*, Modern Man
(d) *Homo erectus*, *Auistralopithecus*, Neanderthal Man, Cro – Magnon Man, Modern Man

199. Which of the following characteristics is mainly responsible for diversification of insects on land?
(a) Exoskeleton
(b) Eyes
(c) Segmentation
(d) Bilateral symmetry

200. Which of the following statement is/are correct?
(i) Adaptative ability is inherited.
(ii) Adaptative ability has a genetic basis
(iii) Fitness is the end result of the ability to adapt and get selected by nature.
(a) Only (ii)
(b) Both (i) and (iii)
(c) All of these
(d) None of these

TEST ASSESMENT AND ANALYSIS SHEET

Name……………..…….…….……….**Test topic -** …….….….….….……….……….……….**Date** …….….…….

Physics	Marks per question	Total Ques.	Attempted	Unattempted	Correct	Incorrect	Net score
Multiple choice questions							
Q. No. (Incorrect)							
Q. No. (Unattempted)							
Chemistry	Marks per question	Total Ques.	Attempted	Unattempted	Correct	Incorrect	Net score
Multiple choice questions							
Q. No. (Incorrect)							
Q. No. (Unattempted)							
Biology	Marks per question	Total Ques.	Attempted	Unattempted	Correct	Incorrect	Net score
Multiple choice questions							
Q. No. (Incorrect)							
Q. No. (Unattempted)							
Total net score							