09/03/2024

Phase-1_Code-A

Corporate Office : Aakash Tower, 8, Pusa Road, New Delhi-110005,
Ph.011-47623456

MM : 720 NCERT Booster Test Series-RM(P1)2324-T06A **Time : 200 Min.**

Topics Covered:
Physics : Moving Charges and Magnetism, Magnetism and Matter, Electromagnetic Induction, Alternating Current; Electromagnetic Waves
Chemistry : Amines, Coordination Compounds, The *d* & *f*-Block Elements
Botany : Molecular Basis of Inheritance, Microbes in Human Welfare
Zoology : Evolution, Human Health & Disease

General Instructions :

1. There are two sections in each subject, i.e. **Section-A** & **Section-B**. You have to attempt all **35 questions** from Section-A & only **10 questions** from Section-B out of **15.**
2. 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.
3. Use blue/black ballpoint pen only to darken the appropriate circle.
4. Mark should be dark and completely fill the circle.
5. Dark only one circle for each entry.
6. Dark the circle in the space provided only.
7. 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

SECTION-A

1. The work done in rotating a bar magnet of magnetic moment *M* from its stable equilibrium position to a position θ = 90° in uniform magnetic field
(1) *MB*
(2) – *MB*
(3) 2 *MB*
(4) – 2 *MB*

2. An ideal transformer increases the input current 4 A to 24 A at the secondary. If the number of turns in the primary coil is 330, the number of turns in the secondary coil is
(1) 60
(2) 65
(3) 55
(4) 45

3. In an AC circuit *V* and *I* are given by *V* = 50 sin(100 π*t*) volt,
$I = 100\sin\left[100\pi t + \frac{\pi}{3}\right]\text{mA}.$
The power dissipated in the circuit is
(1) 2.5 W
(2) 5 W
(3) 0.5 W
(4) 1.25 W

4. The magnetic flux linked with a coil varies with time as $\phi = 3t^2 + 4t + 9$ in weber. What is the induced emf at *t* = 2 second?
(1) 13 V
(2) 19 V
(3) –16 V
(4) –12 V

5. A circular loop of area 2.4 cm^2, carrying current 4 A is placed in a magnetic field of 0.1 T perpendicular to the plane of loop. The torque acting on the loop will be

(1) Zero

(2) 9.6×10^{-4} N m

(3) 4.8×10^{-2} N m

(4) 9.6×10^{-6} N m

6. In an ac circuit $I = 100 \sin 200 \pi t$. The time required for the current to achieve its peak value from zero will be

(1) $\frac{1}{100}\text{sec}$

(2) $\frac{1}{200}\text{sec}$

(3) $\frac{1}{300}\text{sec}$

(4) $\frac{1}{400}\text{sec}$

7. Lorentz force is given by

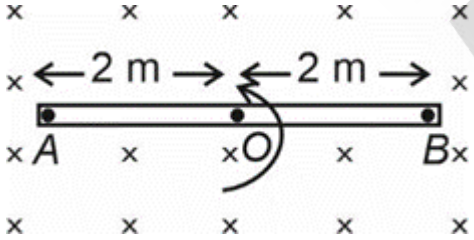
(1) $\vec{F} = q\left[2\vec{E} + \left(\vec{B} \times \vec{v}\right)\right]$

(2) $\vec{F} = q\left[\vec{E} - \left(\vec{v} \times \vec{B}\right)\right]$

(3) $\vec{F} = q\left[\vec{E} - \left(\vec{v} \cdot \vec{B}\right)\right]$

(4) $\vec{F} = q\left[\vec{E} + \left(\vec{v} \times \vec{B}\right)\right]$

8. The given rod *AB* is rotated with an angular speed of 20 rpm in a uniform transverse magnetic field of magnitude 10 T, about its centre O. The emf induced between points *A* and *B* is



(1) $\frac{40\pi}{3}\text{V}$

(2) $\frac{160\pi}{3}\text{V}$

(3) $\frac{80\pi}{3}\text{V}$

(4) Zero

9. If a current of 5 A flowing in a coil of self inductance 2 mH is cut off in 10 ms, then change in magnetic flux, is

(1) 10^{-2} Wb

(2) 1 Wb

(3) 100 Wb

(4) 0.1 Wb

10. A charged particle of charge *q* and mass *m* is moving with velocity *v* on a circular path in uniform magnetic field *B*. Its time period is independent of

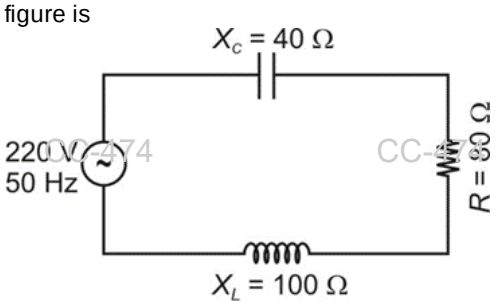
(1) *m*

(2) *v*

(3) *q*

(4) *B*

11. The power factor of the circuit shown in figure is



(1) 0.2

(2) 0.6

(3) 0.8

(4) 0.4

12. Two long parallel straight wires *A* and *B* separated by distance 6 cm carry currents of *I* and 2*I* respectively in the same direction. The distance from *B* at which net magnetic field is zero, is

(1) 2 cm

(2) 1 cm

(3) 5 cm

(4) 4 cm

13. An ac circuit consists of an inductor of inductance 0.5 H and a capacitor of capacitance 8 μF in series. The current in the circuit is maximum when the angular frequency of ac source is

(1) 500 rad/s

(2) 2×10^5 rad/s

(3) 4000 rad/s

(4) 5000 rad/s

14. A charged particle moves in a magnetic field $\vec{B} = 10\hat{i}$ with initial velocity $\vec{u} = 5\hat{i} + 4\hat{j}$. The path of the particle will be

(1) Straight line

(2) Circle

(3) Helical

(4) None

15. Two wires of same length are shaped into a square and a circle. If they carry same current, then ratio of magnetic moment is

(1) 4 : π

(2) $\pi : 4$

(3) $\pi : 2$

(4) $2 : \pi$

16. A one meter long wire is lying at right angles to the magnetic field. A force of 10 N is acting on it in magnetic field of 1 T. The current flowing in it will be

(1) 100 A

(2) 10 A

(3) 1 A

(4) Zero

17. A coil of resistance 100 Ω is placed in a magnetic field. If the magnetic flux ϕ (in Wb) linked with the coil varies with time *t*(in s) as $\phi = 40t^2 + 8$. The current in the coil at time t = 1 s is

(1) 0.8 A

(2) 1.6 A

(3) 2.4 A

(4) 1.0 A

18. Light with an energy flux of 18 W/cm^2 falls on a non-reflecting surface at normal incidence. If the surface has an area of 20 cm^2, find the average force exerted on the surface during a 30 minutes time span.

(1) 2.4×10^{-6} N

(2) 1.2×10^{-6} N

(3) 4.8×10^{-6} N

(4) 3.6×10^{-6} N

19. The rms value of electric field at a distance *r* from a source of electromagnetic wave of power *P* is (Assuming source efficiency is 100%)
(ε : Permittivity of free space)

(1) $\sqrt{\frac{P}{2\pi r^2 c\varepsilon}}$

(2) $\sqrt{\frac{P}{4\pi r^2 c\varepsilon}}$

(3) $\sqrt{\frac{P}{8\pi r^2 c\varepsilon}}$

(4) $\sqrt{\frac{2P}{\pi r^2 c\varepsilon}}$

20. Two coils have self inductances 4 mH and 16 mH respectively. The coefficient of mutual inductance between the coils cannot be

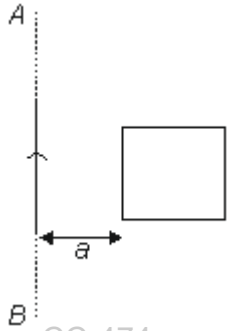
(1) 8 mH

(2) 6 mH

(3) 4 mH

(4) 10 mH

21. A square loop of side *l* is placed at a separation *a* with a very long wire *AB*, in same plane. If the current through *BA* is increasing in the direction shown, the induced current produced in the loop is



(1) Clockwise

(2) Anti-clockwise

(3) Zero

(4) First clockwise then anti-clockwise

22. A 100 Ω resistance and a capacitor of 100 Ω reactance are connected in series across a 220 V source. The peak value of the displacement current is

(1) 2.2 A

(2) 11 A

(3) 4.4 A

(4) $11\sqrt{2}$ A

23. Which of the following waves has the longest wavelength?

(1) Television and FM radio

(2) Infrared

(3) X-rays

(4) Gamma rays

24. The electric and magnetic field of an electromagnetic wave are

(1) In phase and parallel to each other and also parallel to direction of propogation of wave

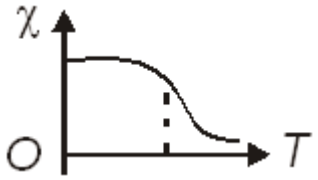
(2) In phase, parallel to each other and perpendicular to direction of propagation of wave

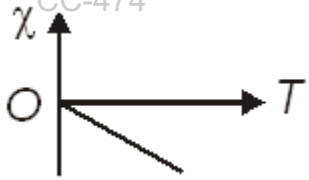
(3) In phase and perpendicular to each other and also perpendicular to direction of propagation of wave

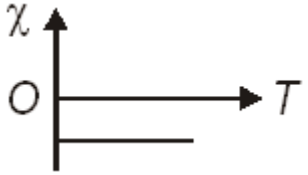
(4) Out of phase, perpendicular to each other and perpendicular to direction of propagation of wave

25. The variation of magnetic susceptibility (χ) with absolute temperature (T) for a diamagnetic material is

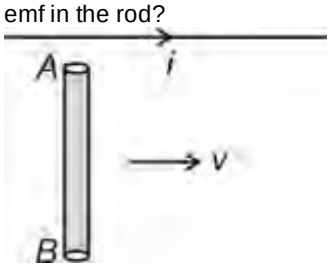
(1) 

(2) 

(3) 

(4) 

26. The current carrying wire and the rod *AB* are in the same plane. The rod moves parallel to the wire with a velocity *v*. Which one of the following statements is true about induced emf in the rod?



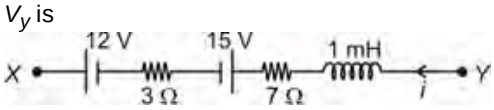
(1) End *A* will be at lower potential with respect to *B*

(2) *A* and *B* will be at the same potential

(3) There will be no induced emf in the rod

(4) Potential at *A* will be higher than that at *B*

27. The figure shows a given circuit. At the instant, the current i = 2 A and it is decreasing at a rate 2×10^3 A/s, then $V_x - V_y$ is



(1) 11 V

(2) 21 V

(3) –11 V

(4) –21 V

28. If an electron enters into a uniform magnetic field with its velocity pointing in the same direction as the magnetic field, then--

(1) The electron will turn to its right

(2) The electron will turn to its left

(3) The velocity of the electron will increase

(4) The velocity of the electron will remain unchanged

29. A rectangular loop carrying a current i is placed in a uniform magnetic field B. The area enclosed by the loop is A. If there are n turns in the loop the torque on the loop is given by

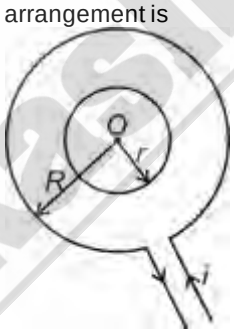
(1) $ni\vec{A} \times \vec{B}$

(2) $ni\vec{A} \cdot \vec{B}$

(3) $\frac{1}{2}\left(i\vec{A} \times \vec{B}\right)$

(4) $\frac{1}{2}\left(i\vec{A} \cdot \vec{B}\right)$

30. Figure shows two concentric loops of radii R and r ($R >> r$). A current i is passed through the outer loop. Mutual inductance of the arrangement is



(1) $\frac{\mu_0 \pi r^2}{R}$

(2) $\frac{\mu_0 \pi R^2}{2r}$

(3) $\frac{\mu_0 \pi r^2}{2R}$

(4) $\frac{\mu_0 \pi R^2}{r}$

31. The dot product of velocity $\left(\vec{c}\right)$ and electric field vector $\vec{E}$ of an electromagnetic wave is equal to

(1) 0

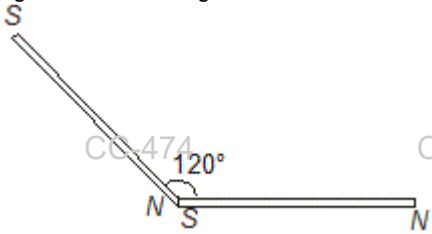
(2) 1

(3) cE

(4) $\frac{c}{E}$

32. The magnetism of a bar magnet is mainly due to
(1) Earth's magnetism
(2) Earth's magnet
(3) Cosmic rays
(4) The spin motion of electron

33. Two identical bar magnets each of magnetic moment 8 A m^2 are oriented as shown in figure. The net magnetic moment is



(1) 8 A m^2
(2) 4 A m^2
(3) $8\sqrt{3}\,\mathrm{A\ m^2}$
(4) $4\sqrt{3}\,\mathrm{A\ m^2}$

34. The magnetic susceptibility is positive for
(1) Diamagnetic material only
(2) Paramagnetic material only
(3) Ferromagnetic material only
(4) Paramagnetic and ferromagnetic material

35. Magnetic flux due to a magnetic field $2\ \mathrm{T}\hat{j}$, through an area $4\ \mathrm{m}^2\ \left(\hat{i}+\hat{j}\right)$ is
(1) 16 Wb
(2) 8 Wb
(3) 4 Wb
(4) 2 Wb

SECTION-B

36. The ratio of displacement current and conduction current in a circuit is equal to
(1) ε_0
(2) $\frac{1}{\varepsilon_0}$
(3) 1
(4) $\frac{1}{\sqrt{\mu_0\varepsilon_0}}$

37. Two long and parallel wires are at a distance of 0.1 m and a current of 5 A is flowing in each of these wires. The force per unit length due to these wires will be
(1) 5×10^{-5} N/m
(2) 5×10^{-3} N/m
(3) 2.5×10^{-5} N/m
(4) 2.5×10^{-4} N/m

38. In an *LR* circuit current at $t = 0$ is 20 A. After 2 second current in the circuit decreased by 2 A. Time constant of the circuit is (in second)
(1) $\ln\left[\frac{9}{10}\right]$
(2) $\frac{2}{\ln\left[\frac{10}{9}\right]}$
(3) $2\ln\left[\frac{9}{10}\right]$
(4) $2\ln\left[\frac{1}{10}\right]$

39. A proton is revolving in a circular path with constant speed. Angle between angular momentum and magnetic dipole moment associated with it is
(1) 0°
(2) 45°
(3) 90°
(4) 180°

40. Choose the wrong statement for electromagnetic wave. They
(1) Are transverse in nature
(2) Travel in vacuum with the speed of light
(3) Are produced by accelerated charges
(4) Travel with same speed in all mediums

41. An AC supply has RMS voltage 30 V which is fed in a pure resistance of 10 Ω. The average power dissipated in this is
(1) 99 watt
(2) 45 watt
(3) 180 watt
(4) 90 watt

42. A bar magnet has magnetic moment *M*. It is bent into a semicircle. The new magnetic momentum will be

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

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

(3) $\frac{M}{\pi}$

(4) *M*

43. The resonance frequency of L–C–R series circuit (when $L = \frac{10}{\pi^2}$ mH and *C* = 0.04 μF) is approximately

(1) 25 kHz

(2) 250 kHz

(3) 2.5 kHz

(4) 25 MHz

44. There exist a magnetic field $\vec{B} = B_0 t\hat{k}$ in a circular region. A circular conducting loop of radius *r* and resistance *R* is placed with its plane in *xy* plane. Determine the current through the loop

(1) $\frac{B_0\pi R^2}{r}$clockwise

(2) $\frac{B_0\pi R^2}{2r}$clockwise

(3) $\frac{B_0\pi r^2}{R}$clockwise

(4) $\frac{B_0\pi r^2}{R}$anticlockwise

45. The resistance of galvanometer is 20 Ω and the maximum current which can be passed through it is 0.004 A. What shunt resistance should be connected to it to convert it into an ammeter of range 0–0.1 A

(1) 0.2 Ω

(2) 0.02 Ω

(3) 0.08 Ω

(4) 0.8 Ω

46. A current carrying wire is making a circular loop of single turn is producing a magnetic field *B* at its centre. If same wire is converted into three number of turns with same current then magnetic field at its centre will be

(1) 9*B*

(2) 3*B*

(3) $\frac{B}{9}$

(4) $\frac{B}{3}$

47. A long straight wire is placed along the axis of a circular ring of radius *R*. The mutual inductance of this system is

(1) Zero

(2) $\frac{\mu_0 R}{2}$

(3) $\frac{\mu_0 \pi R}{2}$

(4) $\frac{\mu_0}{2}$

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

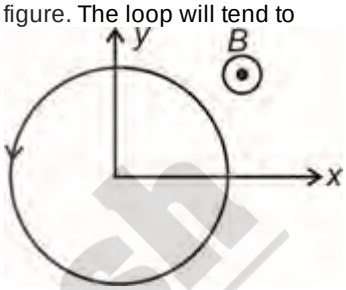
(1) 5500×10^7

(2) 5500×10^{-7}

(3) 5501

(4) 5499

49. A thin flexible wire loop carrying current *I* is placed in a uniform magnetic field *B* pointing out of the plane of the coil as shown in figure. The loop will tend to



(1) Move towards right

(2) Move towards left

(3) Contract

(4) Expand

50. A straight wire of mass 200 g and length 1.5 m carries a current of 2 A. It is suspended in mid-air by a uniform magnetic field *B*. The magnitude of *B* (in tesla) is

(1) 2

(2) 1.5

(3) 0.55

(4) 0.65

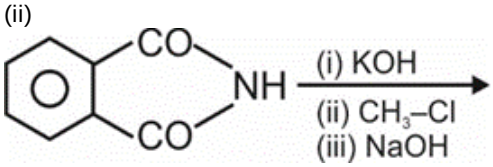
CHEMISTRY

SECTION-A

51. In which of the following reactions, primary amines are formed?

(i) $CH_3CONH_2 \xrightarrow{Br_2+NaOH}$

(ii)



(iii) $CH_3CONH_2 \xrightarrow[(ii)\ H_2O]{(i)\ LiAlH_4}$

(iv) $C_2H_5Cl \xrightarrow[(ii)\ C_2H_5Cl(excess)]{(i)\ NH_3}$

(1) (i) and (ii) only

(2) (i) and (iii) only

(3) (i), (ii) and (iii) only

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

52. Jahn-Teller effect is observed in high spin octahedral complex of

(1) d^3

(2) d^4

(3) d^5

(4) d^8

53. Aqueous solution of $KCl.MgCl_2.6H_2O$ will give the test of

(1) Only Cl^-

(2) Only Mg^{2+}

(3) Mg^{2+} & K^+

(4) K^+, Cl^- and Mg^{2+}

54. Mischmetall contains maximum percent of

(1) Lanthanoid metal

(2) Carbon

(3) Calcium

(4) Aluminium

55. Hybridisation and magnetic moment of Cu in $[Cu(NH_3)_4]^{2+}$ are

(1) dsp^2, 0 BM

(2) sp^3, 0 M

(3) sp^3, $\sqrt{3}$BM

(4) dsp^2, $\sqrt{3}$BM

56. Which kind of isomerism is exhibited by the octahedral complex, $[Co(NH_3)_4Br_2]Cl$?

(1) Geometrical and Ionization

(2) Geometrical and Optical

(3) Optical and Ionization

(4) Only Geometrical

57. Correct order of wavelengths of light absorbed by the given complexes is

$\underset{(i)}{[CrF_6]^{3-}}$ $\underset{(ii)}{[Cr(CN)_6]^{3-}}$ $\underset{(iii)}{[Cr(H_2O)_6]^{3+}}$

$\underset{(iv)}{[Cr(en)_3]^{3+}}$

(1) (i) > (iii) > (iv) > (ii)

(2) (iv) > (ii) > (iii) > (i)

(3) (ii) > (iv) > (iii) > (i)

(4) (iii) > (i) > (iv) > (ii)

58. The IUPAC name of $[Ni(NH_3)_4][NiCl_4]$ is

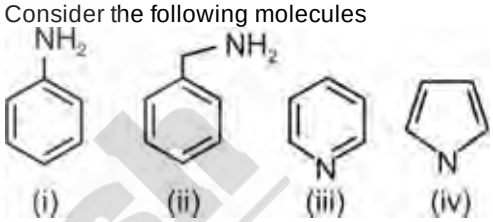
(1) Tetrachloridonickel (II) tetraamminenickel (II)

(2) Tetraamminenickel (II) tetrachloridonickel (II)

(3) Tetraamminenickel (II) tetrachloridonickelate (II)

(4) Tetraamminenickel (IV) tetrachloridonickelate (IV)

59. Consider the following molecules



The correct order of their basic strength is

(1) (iv) > (iii) > (ii) > (i)

(2) (ii) > (iii) > (i) > (iv)

(3) (iii) > (ii) > (i) > (iv)

(4) (ii) > (i) > (iii) > (iv)

60. Spin only magnetic moment of $[Mn(CN)_6]^{3-}$ is

(1) 4.2 BM

(2) 4.9 BM

(3) 2.8 BM

(4) 1.7 BM

61. Heteroleptic complex containing bidentate ligand is

(1) $[Co(NH_3)_4Cl_2]Cl$

(2) $[Co(H_2C)_6]Cl_3$

(3) $K[Co(H_2O)_2(Cl)(CN)_3]$

(4) $[Co(en)_2\ ClBr]I$

62. One mole of which octahedral complex of cobalt will give 2 moles of AgCl as precipitate when reacts with excess of silver nitrate solution?

(1) $CoCl_3 \cdot 6NH_3$

(2) $CoCl_3 \cdot 4NH_3$

(3) $CoCl_3 \cdot 5NH_3$

(4) $CoCl_3 \cdot 3NH_3$

63. Aniline and benzylamine can be chemically distinguished by

(1) Benzenesulphonyl chloride

(2) Br_2/water

(3) aq.HCl

(4) $CHCl_3$/KOH/Δ

64. Consider the following statements about interstitial compounds
(i) They are chemically inert
(ii) They are very hard
(iii) They retain metallic conductivity
The correct statements are

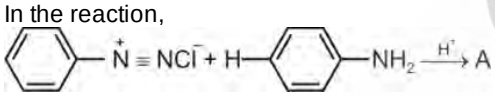
(1) (i) and (ii) only

(2) (ii) and (iii) only

(3) (i) and (iii) only

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

65. In the reaction,



The colour of the compound A is

(1) Orange

(2) Yellow

(3) Green

(4) Blue

66. Which of the following will exhibit maximum ionic conductivity?

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

(2) $K_2[Pt(en)_2Cl_2]$

(3) $[Co(NH_3)_4Cl_2]Cl$

(4) $[Co(NH_3)_6]Cl_3$

67. The nature of CrO and Cr_2O_3 is respectively

(1) Basic, Amphoteric

(2) Basic, Basic

(3) Amphoteric, Acidic

(4) Acidic, Basic

68. Correct order of ionic radii is

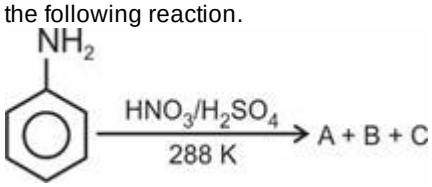
(1) $La^{3+} > Ce^{3+} > Pr^{3+}$

(2) $Ce^{3+} > La^{3+} > Pr^{2+}$

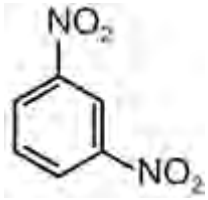
(3) $Pr^{3+} > Ce^{3+} > La^{3+}$

(4) $Pr^{3+} > La^{3+} > Ce^{3+}$

69. Find out the product with maximum yield in the following reaction.

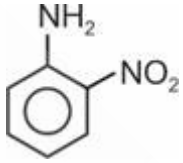


(1)

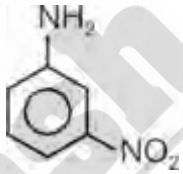


(2)

(3)



(4)



70. Which of the following transition metals has the highest melting point?

(1) Pt

(2) Os

(3) Ir

(4) W

71. Number of Primary amines of the formula $C_4H_{11}N$ is

(1) 1

(2) 2

(3) 3

(4) 4

72. Diamagnetic species among the following is

(1) $[Co(C_2O_4)_3]^{3-}$

(2) $[Fe(CN)_6]^{3-}$

(3) $[Mn(CN)_6]^{3-}$

(4) $[FeF_6]^{3-}$

73. The correct statement among the following is

(1) All the lanthanoids are radioactive elements

(2) Lanthanoid contraction is the accumulation of successive shrinkages

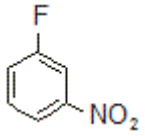
(3) Actinoids have +4 as most common oxidation state

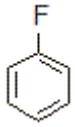
(4) All lanthanoids are very hard metals

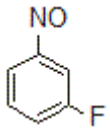
74. Consider the following reaction.

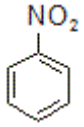
$$C_6H_5NO_2 \xrightarrow{Sn/HCl} A \xrightarrow[0-5^\circ C]{NaNO_2/HCl} B \xrightarrow{HBF_4} C \xrightarrow[Cu,\Delta]{NaNO_2} D$$

Major product D of the reaction sequence is

(1) 

(2) 

(3) 

(4) 

75. Moles of oxalic acid requires to reduce 2 moles of acidified $KMnO_4$ is

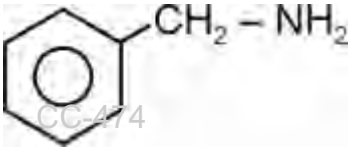
(1) 2

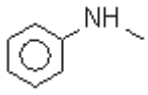
(2) 4

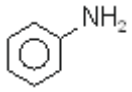
(3) 3

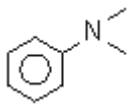
(4) 5

76. Which of the following amine will not react with Hinsberg's reagent?

(1) 

(2) 

(3) 

(4) 

77. Enthalpy of atomisation is least for

(1) Mn

(2) Fe

(3) Cr

(4) Ni

78. Find out the CFSE for high spin d^4 octahedral complex

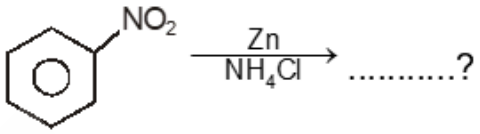
(1) $-0.6\Delta_0$

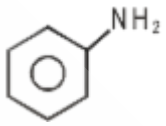
(2) $-1.2\Delta_0$

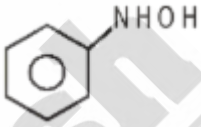
(3) $-1.8\Delta_0$

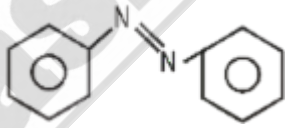
(4) $-2.0\Delta_0$

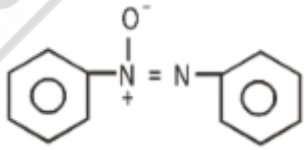
79. What is the product obtained in the following reaction:



(1) 

(2) 

(3) 

(4) 

80. Gadolinium belongs to 4*f* series. Its atomic number is 64. Which of the following is the correct electronic configuration of gadolinium?

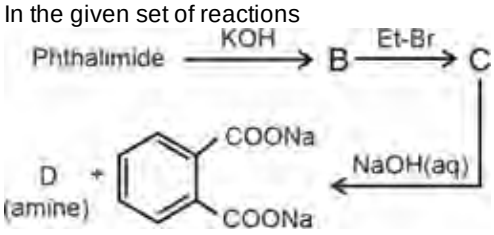
(1) $[Xe]4f^7 5d^1 6s^2$

(2) $[Xe]4f^6 5d^2 6s^2$

(3) $[Xe]4f^8 6d^2$

(4) $[Xe]4f^9 5s^1$

81. In the given set of reactions



D is

(1) CH_3NH_2

(2) $CH_3CH_2NH_2$

(3) $CH_3CH_2NHCH_3$

(4) $(CH_3)_2NH$

82. Activating effect of $-NH_2$ in aniline for electrophilic substitution reaction can be controlled by

(1) Acetylation

(2) Alkylation

(3) Bromination

(4) Sulphonation

83. Correct order of basic strength of the given lanthanoid hydroxides is

(1) $Er(OH)_3 > Gd(OH)_3 > Ce(OH)_3$

(2) $Ce(OH)_3 > Gd(OH)_3 > Er(OH)_3$

(3) $Gd(OH)_3 > Er(OH)_3 > Ce(OH)_3$

(4) $Ce(OH)_3 > Er(OH)_3 > Gd(OH)_3$

84. Brass is an alloy of copper and

(1) Zinc

(2) Tin

(3) Nickel

(4) Manganese

85. Given below are two statements, one is labelled as Assertion and other is labelled as Reason.

Assertion : Cis – $[Co(en)_2Br_2]^+$ is an optically active complex.

Reason : Cis – $[Co(en)_2Br_2]^+$ is an octahedral complex.

In the light of above statements, choose the correct option.

(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

SECTION-B

86. Which of the following will give foul smell when reacts with chloroform in the presence of ethanolic KOH

(1) N–methylethanamine

(2) Propan-1-amine

(3) N,N–dimethylmethanamine

(4) 1–nitropropane

87. The products obtained on heating potassium permanganate at 513 K are

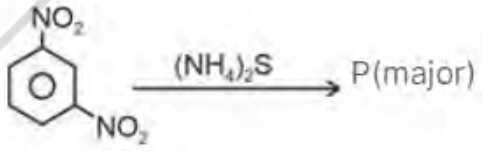
(1) MnO_2 Only

(2) K_2MnO_4, MnO_2, O_2

(3) K_2MnO_4 and MnO_2 Only

(4) MnO_2 and O_2 Only

88.



Major product P is

(1) m-Nitroaniline

(2) p-Nitroaniline

(3) Nitrobenzene

(4) Benzene

89. Which of the following is colored?

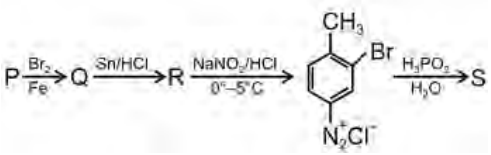
(1) Sc^{3+}

(2) Ti^{4+}

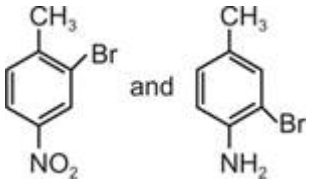
(3) Zn^{2+}

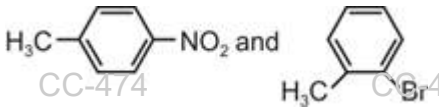
(4) V^{2+}

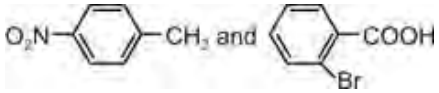
90. In reaction

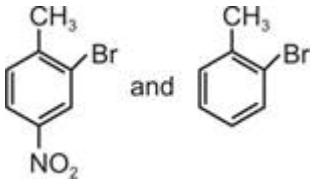


P and S, respectively are

(1) 

(2) 

(3) 

(4) 

91. Correct order of first ionisation enthalpy of the given metal atoms is

(1) Mn > Cr > Sc

(2) Sc > Cr > Mn

(3) Cr > Sc > Mn

(4) Mn > Sc > Cr

92. Maximum number of coordination sites in EDTA is

(1) 3

(2) 4

(3) 5

(4) 6

93. In which of the following carbonyls, the bond length of CO is the highest?

(1) $[V(CO)_6]^-$

(2) $[Cr(CO)_6]$

(3) $[Mn(CO)_6]^+$

(4) $[Fe(CO)_4]^{2-}$

94. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): $[Fe(CN)_6]^{3-}$ and $[FeF_6]^{3-}$ both are octahedral complexes.

Reason (R): Both the complexes $[Fe(CN)_6]^{3-}$ and $[FeF_6]^{3-}$ are formed by d^2sp^3 hybridisation.

(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

95. Cu^{2+} in aqueous state is more stable than Cu^+ due to

(1) High heat of atomisation

(2) High heat of hydration

(3) High effective nuclear charge

(4) Low reduction potential

96. Which of the following ligands form chelate with metal ion?

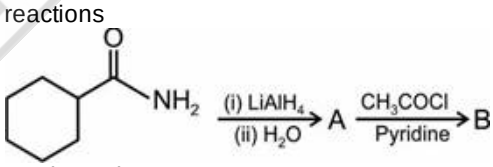
(1) Acetate

(2) Oxalate

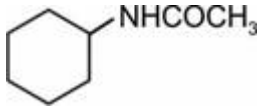
(3) Cyanide

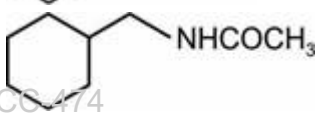
(4) Ammonia

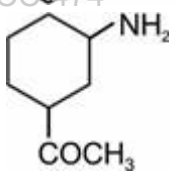
97. Consider the following sequence of reactions

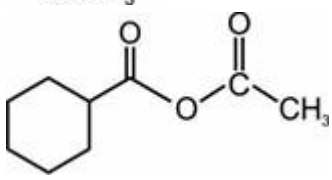


Product B is

(1) 

(2) 

(3) 

(4) 

98. Which of the following is not a transition element?

(1) Sc

(2) Zn

(3) Cu

(4) Mn

99. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): Zwitter-ion in form of sulphanilic acid is

Reason (R): It contains strong acidic part ($-SO_3^-$) and weak basic part $\left(\overset{+}{-}NH_3\right)$

(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

100. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): Mo(VI) and W(VI) are found to be more stable than Cr(VI).

Reason (R): Cr(VI) in the form of dichromate in acidic medium is a strong reducing agent.

In the light of the above statements, choose the correct 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

BOTANY

SECTION-A

101. The eukaryotic organism considered as Biofertiliser is

(1) *Azotobacter*

(2) *Glomus*

(3) *Oscillatoria*

(4) *Nostoc*

102. In mRNA, UTRs are

(1) Present only before the stop codon

(2) Required for efficient transcription

(3) present on both 5' and 3' end of the sequence

(4) Present just after start codon and just before stop codon

103. Choose the **incorrect** statement regarding translation.

(1) In its first phase itself amino acids are activated in presence of ATP

(2) At first the large subunit of the ribosome encounters an mRNA and the process of translation begins

(3) The presence of catalyst enhances the rate of peptide bond formation

(4) The ribosome moves from codon to codon along the mRNA

104. In a double stranded DNA, thymine is 35% of the total nitrogenous bases, then what will be percentage of cytosine?

(1) 35%

(2) 15%

(3) 45%

(4) 20%

105. Match the list I with list II w.r.t. *lac* operon and choose the correct option

	List I		**List II**
a.	*z* gene	(i)	Associated to increase the permeability of the cell to beta galactosides
b.	*y* gene	(ii)	It codes for the enzyme responsible for the hydrolysis of a diasaccharide
c.	*i* gene	(iii)	It encodes for transacetylase
d.	*a* gene	(iv)	Constitutive gene

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

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

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

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

106. Arrange the following steps involved in DNA fingerprinting in the **correct** order and choose the option accordingly.

P – Electrophoresis
Q – Autoradiography
R – Hybridisation with VNTR probe
S – Blotting
T – Isolation of DNA

(1) P → Q → S → T → R

(2) T → P → S → R → Q

(3) T → S → P → Q → R

(4) Q → R → S → T → P

107. Choose the **incorrect** statement for the RNA polymerase.

(1) In bacteria, only single type of RNA polymerase catalyses transcription of all types of RNA

(2) It polymerises in a template independent fashion following the rule of complementarity

(3) It also facilitates the opening of DNA helix

(4) It binds to the promoter and initiates the process of transcription

108. All of the following are stop codons, **except**

(1) UGA

(2) UAA

(3) UAG

(4) UUU

109. The largest known human gene

(1) Has 3000 bases

(2) Has 30000 base pairs

(3) Is present on chromosome Y

(4) Is dystrophin

110. DNA, which is an acidic substance was first identified by

(1) Friedrich Meischer

(2) Altmann

(3) Wilkins and Franklin

(4) Watson and Crick

111. A molecule that can act as genetic material must fulfill the following criteria, **except**

(1) It should be chemically and structurally stable

(2) It should be able to express itself in the form of Mendelian characters

(3) It should be able to generate its replica

(4) It should provide the scope for rapid mutation that are required for evolution

112. Genetic code is degenerate, which means

(1) One codon codes for only one amino acid

(2) Codon is read on mRNA in a contiguous fashion

(3) Three codons do not code for any amino acid

(4) Some amino acids are coded by more than one codon

113. Adenosine differs from a nucleotide as the former lacks
(1) Base
(2) Sugar
(3) N-glycosidic linkage
(4) Phosphate group

114. All of the following form the basis of DNA fingerprinting, **except**
(1) Degree of polymorphism
(2) VNTRs
(3) Minisatellite
(4) ESTs

115. During transcription in eukaryotes
(1) RNA polymerase I synthesises mRNA
(2) RNA polymerase II synthesises rRNA
(3) RNA polymerase II synthesises hnRNA
(4) RNA polymerase III synthesises mRNA

116. The expressed sequences in processed RNA are called
(1) hnRNA
(2) snRNA
(3) Introns
(4) Exons

117. Promoter in a transcription unit is located at
(1) $5'$ end downstream of a non-template strand
(2) $5'$ end downstream non-coding strand
(3) 3′ end downstream of the coding strand
(4) $5'$ end upstream of coding strand

118. Severo Ochoa enzyme is helpful in polymerising $\underline{\quad(a)\quad}$ with defined sequences in a template $\underline{\quad(b)\quad}$ manner.

(a) (b)
(1) RNA Dependent
(2) DNA Dependent
(3) RNA Independent
(4) DNA Independent

(1) (1)
(2) (2)
(3) (3)
(4) (4)

119. RNA splicing
(1) Is removal of exons from mRNA
(2) Is post translational modification in most of the bacteria
(3) Represents the dominance of RNA world
(4) Occur at 3' end in template independent manner

120. By a series of experiments performed by Griffith on mice using *Streptococcus pneumoniae* , he concluded that
(1) RNA can be synthesised from the DNA
(2) Non-virulent bacteria were transformed by heat killed virulent bacteria
(3) Protein digesting enzyme does not affect transformation
(4) DNA is more stable genetic material then the RNA

121. The predominant site for control of gene expression in prokaryotes is
(1) Control of the rate of transcription initiation
(2) Splicing
(3) At translational level
(4) Transport of mRNA from nucleus to cytoplasm

122. DNA replication in prokaryotes is mainly catalysed by
(1) DNA dependent RNA polymerase
(2) RNA dependent RNA polymerase
(3) RNA dependent DNA polymerase
(4) DNA dependent DNA polymerase

123. Which of the following sugars and nitrogenous bases respectively are found exclusively in RNA but not in DNA?
(1) Ribose and Thymine
(2) Deoxyribose and Uracil
(3) Ribose and Uracil
(4) Deoxyribose and Thymine

124. Histone protein is rich in basic amino acids like
(1) Tryptophan and tyrosine
(2) Histidine and cysteine
(3) Methionine and valine
(4) Lysine and arginine

125. Heterochromatin is
(a) Darkly stained region
(b) Loosely packed chromatin
(c) Transcriptionally inactive
The **correct** one(s) is/are
(1) Only (a)
(2) Only (a) and (b)
(3) Only (b) and (c)
(4) Only (a) and (c)

126. The packaging of chromatin in eukaryotes at higher level requires additional set of proteins that are collectively referred to as
(1) Histone proteins
(2) Nucleosomes
(3) Non-Histone Chromosomal (NHC) proteins
(4) Chromatins

127. Number of base pairs in human genome is approximately
(1) 3×10^6
(2) 3×10^9
(3) 6×10^9
(4) 6×10^6

128. The unequivocal proof that DNA is the genetic material came from the experiments of
(1) Frederick Griffith
(2) Alfred Hershey and Martha Chase
(3) Wilkins and Franklin
(4) Chargaff

129. Which RNA plays a catalytic role during translation?
(1) hnRNA
(2) tRNA
(3) rRNA
(4) mRNA

130. Swiss cheese and Roquefort cheese are ripened with the help of a
(1) Fungus and a bacterium respectively
(2) Bacterium and a fungus respectively
(3) Cyanobacterium and fungus respectively
(4) Bacterium

131. Biological sewage treatment is called
(1) Sequential filtration
(2) Primary treatment
(3) Secondary treatment
(4) Tertiary treatment

132. Read the following statements and select the **correct** option.
Assertion (A) : Biogas plants are more often built in rural areas.
Reason (R) : Cattle dung is available in large quantities in rural areas.
(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

133. Organism responsible for ethanol production in brewing industries is
(1) *Penicillium*
(2) *Streptococcus*
(3) *Saccharomyces*
(4) *Bacillus*

134. a. $\underline{(i)}$ have species-specific, narrow spectrum insecticidal applications.
b. *Bt* is a microbial biocontrol agent that can be introduced to control $\underline{(ii)}$.
(1) (i)- *Trichoderma*, (ii) - Butterfly
(2) (i)- Baculoviruses, (ii) - Butterfly caterpillars
(3) (i)- Dragonflies, (ii) - Aphids
(4) (i)- NPV, (ii) - Mosquitoes

135. Biogas produced in anaerobic sludge digesters is a mixture of
(1) Methane and carbon dioxide only
(2) Hydrogen sulphide and methane only
(3) Methane, carbon dioxide and hydrogen sulphide
(4) Carbon dioxide, methane and oxygen

SECTION-B

136. Which of the given is **not** commercially produced by bacteria?
(1) Lactic acid
(2) Butyric acid
(3) Citric acid
(4) Acetic acid

137. A , a beetle with red and black markings, is useful in controlling B .
Select the **correct** option and complete the above statement.
(1) A–Ladybird, B–aphids
(2) A–Ladybird, B–mosquitoes
(3) A–Dragonfly, B-aphids
(4) A–Dragonfly, B-mosquitoes

138. All solids that settle during primary stage of waste water treatment forms
(1) Primary sludge
(2) Primary effluent
(3) Activated sludge
(4) Flocs

139. Which pyrimidine is common to both DNA and RNA?
(1) Uracil
(2) Cytosine
(3) Adenine
(4) Thymine

140. In which of the following aspects transcription in prokaryotes is similar to that of the eukaryotes?
(1) In having same types of RNA polymerases
(2) Get coupled with the translation
(3) The direction of RNA polymerisation
(4) They require to process the primary transcript

141. Read the given statements and select the **correct** option.
Statement A: Ministry of Environment and Forest has initiated Ganga Action Plan.
Statement B: Effluent from secondary treatment cannot be released into water bodies
(1) Only A is correct
(2) Only B is correct
(3) Both A & B are correct
(4) Both A & B are incorrect

142. A transcription unit is primarily defined by three regions in DNA as
(1) Promoter, terminator and inducer
(2) Promoter, structural gene and terminator
(3) Inducer, structural gene and operator
(4) Promoter, operator and structural gene

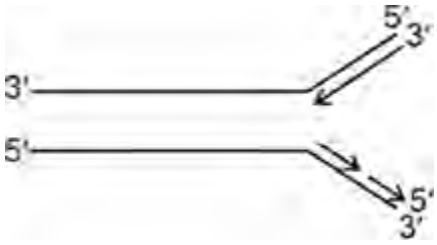
143. In eukaryotes, the first level of regulation of gene expression is
(1) Transcription
(2) Translation
(3) Transport of mRNA from nucleus to the cytoplasm
(4) Regulation of splicing

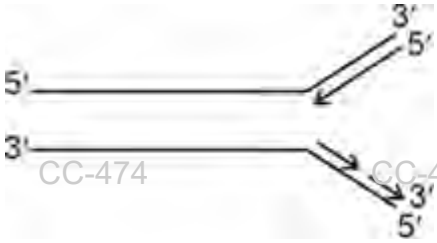
144. Read the given statements (A-D) stating true **(T)** or false **(F)** and select the **correct** option.
A. Antibiotics are the chemical substances which are produced by some microbes and can kill or retard the growth of other microbes.
B. Flocs are masses of bacteria associated with fungal filaments.
C. Raising of crops through the use of chemical fertilizers is organic farming.
D. IPM involves conservation of beneficial insects

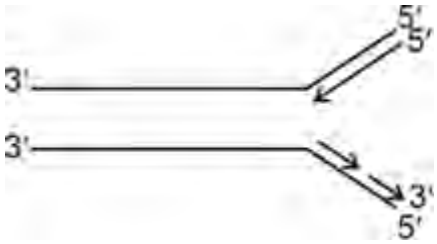
	A	B	C	D
(1)	T	F	F	F
(2)	T	T	T	T
(3)	T	T	F	T
(4)	F	F	T	T

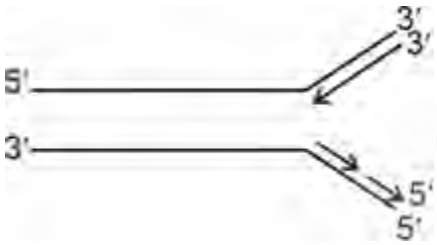
(1) (1)
(2) (2)
(3) (3)
(4) (4)

145. Which of the following **correctly** represents the pattern of replication of DNA?

(1) 

(2) 

(3) 

(4) 

146. The blind approach of simply sequencing the whole set of genome that contained all coding and non-coding sequence and later assigning different regions in the sequence with functions is referred to as

(1) Expressed sequence tags
(2) Sequence annotation
(3) Bioinformatics
(4) Polymorphism

147. Which of the given rRNAs plays dual role as structural RNA as well as catalyst in bacteria?

(1) 18S rRNA
(2) 5S rRNA
(3) 5.8S rRNA
(4) 23S rRNA

148. Live S strain of *Streptococcus pneumoniae*

(1) Is non-virulent
(2) Does not develop pneumonia in mice
(3) Lacks polysaccharide coat
(4) Produces smooth shiny colonies in culture plate

149. Alexander Fleming discovered the first antibiotic while working on

(1) *Staphylococci*
(2) *Lactobacillus*
(3) *Trichoderma*
(4) *Aspergillus*

150. If a hybrid DNA is allowed to replicate for two generations in N^{14} containing medium then the proportion of light, hybrid and heavy DNA will be respectively

(1) 75%, 25% and 0%
(2) 25%, 25% and 50%
(3) 0%, 50% and 50%
(4) 25%, 0% and 75%

ZOOLOGY

SECTION-A

151. Which of the following are non-ionising radiations?
(1) Gamma rays
(2) Ultraviolet rays
(3) X-rays
(4) Rays used in CT

152. Select the **incorrect** statement w.r.t. evolution.
(1) Life probably appeared 500 million years after the formation of Earth.
(2) The first cellular form of life appeared on Earth about 2000 mya.
(3) It is presumed that around 200 mya *Ichthyosaurs* evolved from amphibians.
(4) About 65 mya, the dinosaurs suddenly disappeared from Earth.

153. Presence of all of the following factors can alter the Hardy-Weinberg equilibrium, **except**
(1) Gene migration
(2) Genetic drift
(3) Assortative mating
(4) Random mating

154. The animals called lobefins which evolved into the first amphibians were
(1) Coelacanths
(2) Salamanders
(3) Modern day frogs
(4) Crocodiles

155. Select the **odd one** w.r.t. Australian marsupials.
(1) Numbat
(2) Tasmanian wolf
(3) Spotted cuscus
(4) Flying squirrel

156. For a long time it was believed that life came out of decaying and rotting matter like straw, mud etc. This was the theory of
(1) Special creation
(2) Catastrophism
(3) Spontaneous generation
(4) Panspermia

157. Therapsids were the direct ancestors of
(1) Mammals
(2) Crocodiles
(3) Dinosaurs
(4) Birds

158. Arrange the following in increasing order of their cranial capacities.
(a) *Homo habilis*
(b) Neanderthal man
(c) *Homo erectus*
Select the **correct** option.
(1) a < b < c
(2) c < b < a
(3) a < c < b
(4) c < a < b

159. The main concept of Darwinian theory is natural selection. It is possible that the work of 'Thomas Malthus' on 'Populations' influenced Darwin.
Select the incorrect option w.r.t Malthusian theory.
(1) The population remain stable in size except for seasonal fluctuations.
(2) Natural resources are limited in nature.
(3) Nature keeps a control over the size of the population.
(4) Every population has an inherent capacity to increase its number logarithmically if every individual of that population reproduced maximally.

160. In a hypothetical population of 1000 people, tests of blood type genes show that 160 have genotype AA, 480 have the genotype AB and 360 have the genotype BB. Calculate the frequency of allele B and select the **correct** option.
(1) 0.40
(2) 0.60
(3) 0.10
(4) 0.02

161. Choose the **correct** sequence w.r.t. plant evolution.
(1) Psilophyton → Rhynia type plants → Chlorophyte ancestors → Tracheophyte an cestors
(2) Tracheophyte ancestors → Chlorophyte ancestors → Rhynia type plants → Psilophyton
(3) Rhynia type plants → Tracheophyte ancestors → Psilophyton → Chlorophyte ancestors
(4) Chlorophyte ancestors → Tracheophyte ancestors → Rhynia type plants → Psilophyton

162. During industrial revolution in England, the dark-winged peppered moth became dominant over the white-coloured moth. This case is an example of

(1) Anthropogenic action by artificial selection

(2) Natural selection whereby melanised forms were selected over non-melanised forms.

(3) Pollution generated feature of melanism.

(4) Occurrence of random mutation leading to a decline of true black melanic forms.

163. As the female *Anopheles* mosquito is related with malaria, *Aedes* mosquito is related with

(1) Typhoid

(2) Filariasis

(3) Dengue fever

(4) Mumps

164. Select the features which are **true** for *Australopithecines*.
(a) Walked bipedally
(b) Earliest fossils obtained from Australia
(c) Man-like primates walked in East-African grasslands
(d) Existed probably 2 mya
Choose the **correct** option.

(1) (a), (c) and (d)

(2) (a), (b), (c) and (d)

(3) (b), (c) and (d)

(4) (a), (b) and (c)

165. Choose the **correct** option w.r.t. *Brachiosaurus*.

(1) They were a three-horned dinosaurs.

(2) They can be described as bipedal, carnivore with dagger-like teeth.

(3) They possibly shared common ancestor with *Pteranodon*, *Stegosaurus* and *Archaeopteryx*.

(4) They were the direct ancestor of *Triceratops*, Crocodile and *Tyrannosaurus*.

166. Natural selection where more individuals acquire peripheral character value at both ends of the distribution curve leads to

(1) Stabilizing change

(2) Balancing change

(3) Disruptive change

(4) Directional change

167. Read the following statements carefully.
A) Studies suggest that first organisms that invaded land were plants.
B) Saltations are single step large mutations and Darwinian variations are small and directional.
C) Sauropsids were common ancestors of therapsids and thecodonts.
D) *Homo habilis* was the first hominid with brain capacity ranging between 650-800 cc
Choose the **correct** option w.r.t. True (T) and False (F) statements.

	A	B	C	D
(i)	T	F	T	F
(ii)	F	T	F	T
(iii)	T	T	F	T
(iv)	T	T	F	F

(1) (i)

(2) (ii)

(3) (iii)

(4) (iv)

168. When a population is in Hardy-Weinberg equilibrium.

(1) All of its recessive lethal genes are wiped out, leaving only healthy dominant genes.

(2) Mutations occur at five times the normal rate to balance the loss of genes by way of natural selection

(3) The frequencies of the alleles in the population change over time

(4) The frequencies of genotypes in the population are stable over time

169. **Assertion (A) :** Vertebrate hearts are considered as homologous organs.
Reason (R) : Hearts of fishes, amphibians, reptiles and birds show a similar basic structure with varied degree of functional specialization.
In the light of above statements select the correct option.

(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.

170. Given are some techniques useful in detection of cancers of the internal organs.
(A) Radiography
(B) MRI
(C) CT
(D) Biopsy
Select the option which uses X-ray radiations.
(1) (A) and (B)
(2) (B) and (C)
(3) (C) and (D)
(4) (A) and (C)

171. Consider the following options w.r.t cocaine and select the incorrect one.
(1) Often used for the treatment of insomnia
(2) Obtained from a plant native to South America
(3) Similar to *Atropa belladona* in being hallucinogenic
(4) Interferes with the transport of dopamine

172. Read the following statements and select the correct option.
Statement (A) : Agranulocytes such as neutrophils and monocytes belong to the non-specific type of immunity.
Statement (B) : Natural killer cells are a type of lymphocytes that destroy microbes.
(1) Both (A) and (B) are correct
(2) Both (A) and (B) are incorrect
(3) Only (A) is correct
(4) Only (B) is correct

173. Which of the following species of *Plasmodium* is responsible for causing malignant malaria?
(1) *vivax*
(2) *malariae*
(3) *falciparum*
(4) *ovale*

174. Mucous coating of the epithelium lining the respiratory, gastrointestinal and urogenital tracts help in trapping microbes entering our body. It belong to which group of innate immunity?
(1) Physical barriers
(2) Cellular barriers
(3) Cytokines barriers
(4) Physiological barriers

175. Secondary immune response is rapid than primary immune response because
(1) Our body appears to have memory of the pathogen's first encounter
(2) It is pathogen specific
(3) Our body encounters a pathogen for the first time
(4) It is not pathogen specific

176. The yellowish fluid produced during initial days of lactation is rich in antibody that
(1) Can cross the placental barrier
(2) Is associated with allergic manifestations
(3) Is largest in size
(4) Is also found in mucus secretions of upper GIT

177. If a person is bitten by *Vipera* then, in such case which of the following should be given immediately for quick immune response?
(1) An antitoxin
(2) A toxoid
(3) A vaccine
(4) An antigenic polypeptide

178. A 27-year old man had both of his kidneys failed. Doctor advised him for kidney transplantation. After diligence, a donor was found and transplant was done after a proper tissue-matching and blood group matching. The body rejected the graft after a week of surgery. This rejection is caused mainly due to
(1) Cell-mediated immune response
(2) Humoral immune response
(3) Antibody mediated response
(4) B-lymphocytes mediated response

179. Infective stage of *Plasmodium* after entering in human blood first migrates to
(1) Kidney
(2) Heart
(3) Liver
(4) RBC

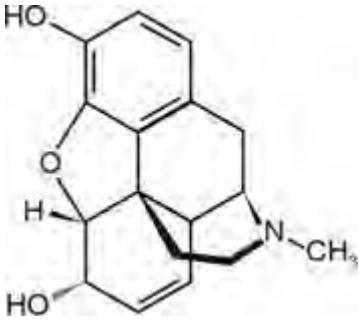
180. *Smack* is chemically
(1) Cannabinoid
(2) Amino acid
(3) Cocaine
(4) Diacetylmorphine

181. Which is/are **correct** about Amoebiasis?
a. Caused by *Entamoeba histolytica.*
b. Stools with excess mucus and blood clots.
c. Life cycle is completed in human and housefly.
d. Transmission through faeco-oral route.
Select the corect option.
(1) a, b and c
(2) b, c and d
(3) a, b and d
(4) a, c and d

182. A gland 'X' called the training school of T-lymphocytes is also responsible for the maturation of T-lymphocytes. Identify the 'X' and choose the correct option.
(1) Thymus
(2) Thyroid
(3) Pancreas
(4) Hypothalamus

183. Which of the following are phagocytic cells derived from the largest cells of the blood and also act as cellular barriers to provide immunity ?
(1) Neutrophils
(2) Basophils
(3) Macrophages
(4) Eosinophils

184. Identify the compound given below and select the option with only **correct** statements.



A. It is extracted from poppy plant.
B. They are known for their effects on central nervous system and GIT.
C. Obtained from inflorescences of the plant.
D. Generally taken by inhalation and injection.
(1) A and C
(2) B and C
(3) C and D
(4) A, B and D

185. A novel approach for the treatment of cancer is the use of biological response modifiers called _____ which activate the immune system and destroy the tumor. Choose the option which fills the blank **correctly**
(1) Vinblastin
(2) X-rays
(3) α-interferons
(4) Oncogenes

SECTION-B

186. Choose the **incorrect** statement w.r.t *Homo erectus*.
(1) Their fossil discovered in 1891
(2) They had a large brain in comparison to the first human like being the hominid.
(3) They probably ate meat.
(4) They arose during ice age, around 75,000-10,000 year ago.

187. In electric discharge experiment performed by S.L. Miller in 1953, the gases taken in spark discharge chamber were

(1) CH_4 and NH_3 only

(2) CH_4, H_2, NH_3 and water vapour at 800°C

(3) CH_4, H_2, NH_3 and water vapour at 800°F

(4) CH_4, O_2, NH_3 and water vapour at 800°C

188. Select the set of structures that are homologous to each other.

(1) A butterfly's wing and a bat's wing

(2) A moth's eyes and a cow's eyes

(3) Flippers of penguins and dolphins

(4) Forelimbs of cheetah and humans

189. Jawless fish probably evolved around _____ and sea weed existed probably around _____.
Choose the option that correctly fills the blank respectively.

(1) 350 mya ; 320 mya

(2) 350 bya ; 320 bya

(3) 350 bya ; 320 mya

(4) 35 mya ; 32 mya

190. What was the **most** significant trend in the evolution of modern man (*Homo sapiens*) during evolutionary lineage?

(1) Increasing cranial capacity

(2) Erect posture and bipedalism

(3) Opposable thumb

(4) Binocular and stereoscopic vision

191. Choose the **incorrect** match.

(1) Hunted with stone weapons and ate meat – *Australopithecines*

(2) Arose in Africa and moved across continents – *Homo sapiens*

(3) Buried his dead and lived in Central Asia – Neanderthal man

(4) First one to use fire and fossils were found in Java – *Homo erectus*

192. Which of the following is a connecting link between apes and man?

(1) *Homo habilis*

(2) *Homo erectus*

(3) *Australopithecus*

(4) *Homo sapiens*

193. **Assertion (A) :** Tobacco can raise blood pressure and increase heart rate.
Reason (R) : Tobacco contains nicotine which stimulates adrenal cortex to release epinephrine and nor epinephrine.
In the light of above statements, select 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) (A) is false but (R) is true

194. Internal bleeding, muscular pain, fever, anemia and blockage of intestinal passage are some of the symptoms of

(1) Ascariasis

(2) Amoebiasis

(3) Elephantiasis

(4) Typhoid fever

195. Antigen binding site in an antibody is formed by

(1) Variable regions of heavy chains only

(2) Variable regions of light chain and heavy chain

(3) Constant regions of light chains and four heavy chain

(4) Constant regions of light chains only

196. Read the following statements regarding cancer and select the **correct** option stating which one is **true(T)** and which one is **false(F)**.
A. Cancer cells do not show contact inhibition.
B. Metagenesis is the most feared property of malignant tumor.
C. Depletion of ozone layer in atmosphere can lead to increased incidence of skin cancer.
D. Immunotherapy can be used to treat various forms of cancer.

	A	B	C	D
(i)	F	F	F	T
(ii)	T	F	T	T
(iii)	T	F	T	F
(iv)	F	F	T	T

(1) (i)

(2) (ii)

(3) (iii)

(4) (iv)

197. Select the autoimmune disease among the following.

(1) Ascariasis

(2) Rheumatoid arthritis

(3) Filariasis

(4) Amoebiasis

198. **Assertion (A) :** Interferons belong to phagocytic barriers of immunity.
Reason (R) : Interferons are glycoproteins produced by body cells infected by bacteria.
In the light of above statements select the correct option.

(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

199. Smoking increases 'X' content in blood and reduces the concentration of 'Y'.
Identify the 'X' and 'Y' respectively and choose the correct option.

(1) Carbon dioxide (CO_2) and haembound oxygen

(2) Carbon monoxide (CO) and haembound oxygen

(3) Carbon dioxide (CO_2) and haembound carbon

(4) Carbon monoxide (CO) and haembound carbon

200. Due to decrease in the number of helper T lymphocytes, a person starts suffering from infections especially due to *Mycobacterium,* viruses, fungi and even parasites like *Toxoplasma*. *Toxoplasma* is a

(1) Bacteria

(2) Fungus

(3) Protozoan

(4) Virus