MOCK TEST PAPER 10

General Instructions : *Same as Mock Test Paper 1.*

PHYSICS

Section A

1. The radii of circular orbits of two satellites A and B of the Earth, are 4R and R, respectively. If the speed of satellite A is 3V, then the speed of satellite B will be:
(a) 3V/4 **(b)** 6V **(c)** 12V **(d)** 3V/2

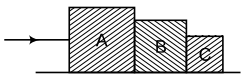
2. A polaroid is placed at 45° to an incoming light of intensity I_0. Now the intensity of light passing through polaroid after polarization would be :
(a) I_0 **(b)** $I_0/2$ **(c)** $I_0/4$ **(d)** Zero

3. If the mass of Sun were ten times smaller and the universal gravitational constant were ten times larger in magnitude, then which of the following is not correct?
(a) Time period of a simple pendulum on the Earth would decrease.
(b) Walking on the ground would become more difficult.
(c) Raindrops will fall faster.
(d) 'g' on the Earth will not change.

4. A body of mass m rises to height $h = \frac{R}{5}$ from the Earth's surface, where R is Earth's radius. If g is the acceleration due to gravity at Earth's surface, the increase in potential energy is:
(a) mgh **(b)** $\frac{4}{5}mgh$ **(c)** $\frac{5}{6}mgh$ **(d)** $\frac{6}{7}mgh$

5. A galvanometer has a coil of resistance 100 ohm and gives a full scale deflection for 30 mA current. If it is to work as a voltmeter of 30 volt range, the resistance required to be added will be :
(a) 900 Ω **(b)** 1800 Ω **(c)** 500 Ω **(d)** 1000 Ω

6. Three blocks A, B and C, of masses 4 kg, 2 kg and 1 kg respectively, are in contact on a frictionless surface, as shown. If a force of 14 N is applied on the 4 kg block, then the contact force between A and B is :



(a) 18 N **(b)** 2 N **(c)** 6 N **(d)** 8 N

7. If x longitudinal strain is produced in a wire of Young's modulus y, then energy stored per unit volume in the material of the wire is:
(a) yx^2 **(b)** $2yx^2$ **(c)** $\frac{1}{2}y^2x$ **(d)** $\frac{1}{2}yx^2$

8. For a series LCR circuit, the power loss at resonance is:
(a) $\frac{V^2}{\omega L - \frac{1}{\omega C}}$ **(b)** $I^2C\omega$ **(c)** I^2R **(d)** $\frac{V^2}{\omega C}$

9. If a block moving up an inclined plane inclined at an angle, $\theta = 30°$ with a velocity 5 m/s, stops after 0.5 sec, then μ is:
(a) 0.5 **(b)** 1.25
(c) 0.6 **(d)** none of these

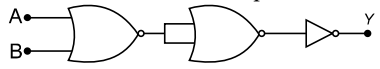
10. When air in a capacitor is replaced by a medium of dielectric constant K, the capacity:
(a) Decreases K times **(b)** Increases K times
(c) Increases K^2 times **(d)** Remains constant

11. A long solenoid has 1000 turns. When a current of 4 A flows through it, the magnetic flux linked with each turn of the solenoid is 4×10^{-3} Wb. The self-inductance of the solenoid is:
(a) 4 H **(b)** 3 H **(c)** 2 H **(d)** 1 H

12. Potential energy of a satellite having mass 'm' and rotating at a height of 6.4×10^6 m from the Earth centre is:
(a) $-0.5mgR_e$ **(b)** $-mgR_e$ **(c)** $-2mgR_e$ **(d)** $4mgR_e$

13. A galvanometer of 50 ohm resistance has 25 divisions. A current of 4×10^{-4} ampere gives a deflection of one division. To convert this galvanometer into a voltmeter having a range of 25 volts, it should be connected with a resistance of:
(a) 2500 Ω as a shunt **(b)** 2450 Ω as a shunt
(c) 2550 Ω in series **(d)** 2450 Ω in series

14. The given electrical network is equivalent to:



(a) AND gate **(b)** OR gate **(c)** NOR gate **(d)** NOT gate

15. A conducting circular loop is placed in a uniform magnetic field 0.04 T with its plane perpendicular to the direction of magnetic field. The radius of the loop starts shrinking at 2 mm/s. The induced emf in the loop when the radius is 2 cm is:
(a) 4.8π μV **(b)** 0.8π μV **(c)** 1.6π μV **(d)** 3.2π μV

16. An astronaut orbiting the Earth in a circular orbit of radius 120 km above the surface of Earth, gently drops a spoon out of his space-ship. The spoon will:
(a) fall vertically down to the Earth.
(b) move towards the Moon.
(c) move along with the space-ship.
(d) move in an irregular way then fall down to the Earth.

17. When a body is lifted from surface of the earth to a height equal to the radius of the earth, then the change in its potential energy is
(a) mgR **(b)** 2mgR **(c)** 1/2mgR **(d)** 4mgR

18. A magnet of magnetic moment M and pole strength m is divided in two equal parts, then magnetic moment of each part will be:
(a) M **(b)** $\frac{M}{2}$ **(c)** $\frac{M}{4}$ **(d)** 2M

19. In the half wave rectifier circuit operating from 50 Hz main frequency, the fundament frequency in the ripple would be
(a) 25 Hz **(b)** 50 Hz **(c)** 70.7 Hz **(d)** 100 Hz

20. 70 cal of heat is required to raise the temperature of 2 mol of an ideal gas at constant pressure from 30°C to 35°C. The amount of heat required to raise the temperature of the same sample of the gas through the same range of temperature (30°C to 35°C) at constant volume will be (gas constant = 2 cal/mol)
(a) 30 cal **(b)** 50 cal **(c)** 60 cal **(d)** 80 cal

21. The only force acting on a block is along x-axis, given by $F = -\left(\frac{4}{x^2+2}\right)$N. When the block moves from $x = -2$ m to $x = 4$ m, the change in kinetic energy of block is:
(a) Positive **(b)** Negative **(c)** Zero
(d) May be positive or negative

22. If the acceleration due to gravity at a height 1 km above the Earth is the same as at a depth d below the surface of Earth, then
(a) $d = 2$ km **(b)** $d = 1/2$ km
(c) $d = 1$ km **(d)** $d = 3/2$ km

23. From the following quantities, which one has dimension different from the remaining three?
(a) Energy per unit volume
(b) Force per unit area
(c) Product of voltage and charge per unit volume
(d) Angular momentum

24. The coordinates of centre of mass of the following quarter circular arc is:
(a) $\left(\frac{r}{2},\frac{r}{2}\right)$ **(b)** $\left(\frac{2r}{3},\frac{2r}{3}\right)$ **(c)** $\left(\frac{2r}{\pi},\frac{2r}{\pi}\right)$ **(d)** $\left(\frac{4r}{\pi},\frac{4r}{\pi}\right)$

25. An electric dipole is placed at an angle of 30° to a non-uniform electric field. The dipole experiences:
(a) a torque as well as a translational force.
(b) a torque only.
(c) a translational force only in the direction of field.
(d) a translational force only in a direction normal to the direction of the field.

26. An aeroplane moves 400 m towards north, 300 m towards west and then 1200 m vertically upwards. Then its displacement from the initial position is
(a) 1300 m **(b)** 1400 m **(c)** 1500 m **(d)** 1600 m

27. If Planck's constant (h), speed of light in vacuum (c) and Newton's gravitational constant (G) are the three fundamental constants. Which of the following combinations of these has the dimension of length?
(a) $\frac{\sqrt{hG}}{c^{3/2}}$ **(b)** $\frac{\sqrt{hG}}{c^{5/2}}$ **(c)** $\frac{\sqrt{hc}}{G}$ **(d)** $\frac{\sqrt{Gc}}{h^{3/2}}$

28. A small ball of density ρ is dropped from a height h into a liquid of density σ(σ > ρ). Neglecting damping forces, the maximum depth to which the body sinks is
(a) $\frac{h\sigma}{\rho-\sigma}$ **(b)** $\frac{h\rho}{\rho-\sigma}$ **(c)** $\frac{h(\sigma-\rho)}{\rho}$ **(d)** $\frac{h(\aleph\ \ )}{\sigma}$

29. If charge of 10 μC and –2 μC are given to two plates of a capacitor which are connected across a battery of 12 V, then find the capacitance of the capacitor.
(a) 0.33 μF **(b)** 0.5 μF **(c)** 0.41 μF **(d)** 0.66 μF

30. A ruby laser produces radiations of wavelengths, 662.6 nm in pulses whose durations are 10^{-9} s. If the laser produces 0.39 J of energy per pulse, how many photons are produced in each pulse?
(a) 1.3×10^{9} **(b)** 1.3×10^{18}
(c) 1.3×10^{27} **(d)** 3.9×10^{18}

31. Two specific heats of a perfect gas are related by:
(a) $C_P - C_v = R/J$ **(b)** $C_P - C_v = J$
(c) $C_P - C_v = RJ$ **(d)** $C_P + 1/C_v = 2.4$ cal

32. When a particle is moving in a vertical circle,
(a) its radial and tangential acceleration both are constant.
(b) its radial and tangential acceleration both are varying.
(c) its radial acceleration is constant but tangential acceleration is varying.
(d) its radial acceleration is varying but tangential acceleration is constant.

33. The shortest wavelength of the Brackett series of a hydrogen like atom (atomic number = Z) is the same as the shortest wavelength of the Balmar series of hydrogen atom. The value of Z is:
(a) 2 **(b)** 3 **(c)** 4 **(d)** 6

34. Which of the following is the correct statement about an object immersed in a liquid at rest and left free to move?
(a) Buoyancy force is equal to the weight of the object.
(b) Centre of buoyancy coincides with the centre of mass of the object.
(c) If the density of the object is equal to the density of the liquid then the object moves in the liquid with constant velocity.
(d) If the object sinks, then the weight of the displaced fluid is less than the force of buoyancy.

35. According to de-Broglie's hypothesis, particles can be associated with waves. Consider a double slit experiment with mono energetic electrons. Instead of screen, optical detectors are used. If the speed of the electrons is increased,
(a) the interference pattern vanishes.
(b) the distance between consecutive fringes increases.
(c) the distance between consecutive fringes decreases.
(d) the interference pattern is unaffected.

Section B

36. In stationary waves, antinodes are the points where:
(a) minimum displacement and minimum pressure change occur.
(b) minimum displacement and maximum pressure change occur.
(c) maximum displacement and maximum pressure change occur.
(d) maximum displacement and minimum pressure change occur.

37. The angle of incidence of a ray of light at a reflecting surface of an equilateral prism is 50°. If the ray suffers minimum deviation through the prism, the angle of minimum deviation and refractive index of the material of the prism respectively are (sin 50° = 0.7660)
(a) 40° , 1.5 **(b)** 30°, 1.5 **(c)** 40° , 1.6 **(d)** 30°, 1.6

38. The displacement of a particle, moving in a straight line, is given by $s = 2t^2 + 2t + 4$ where s is in metres and t in seconds. The acceleration of the particle is:
(a) 2 m/s^2 **(b)** 4 m/s^2 **(c)** 6 m/s^2 **(d)** 8 m/s^2

39. 22 g of CO_2 at 27°C is mixed with 16 g of O_2 at 37°C. The temperature of the mixture is:
(a) 32°C **(b)** 27°C **(c)** 37°C **(d)** 30.5°C

40. Velocity of light in glass whose refractive index with respect to air is 1.5 is 2×10^8 m/s and in certain liquid the velocity of light is found to be 2.5×10^8 m/s. The refractive index of the liquid with respect to air is:
(a) 0.64 **(b)** 0.80 **(c)** 1.20 **(d)** 1.44

41. A body falls freely from the top of a tower. It covers 36% of total height in the last second before striking the ground. Find height of the tower.
(a) 50 m **(b)** 250 m **(c)** 75 m **(d)** 125 m

42. The equation of motion of a projectile is

$$y = 12x - \frac{3}{4}x^2$$

What is the range of projectile?
(a) 12 m **(b)** 16 m **(c)** 20 m **(d)** 24 m

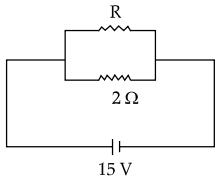
43. A body is moving in a circle of radius 80 m with a speed of 20 m/s which is decreasing at a rate of 5 m/s^2 at an instant. The angle made by its acceleration with its velocity is
(a) 45° **(b)** 90° **(c)** 135° **(d)** 0°

44. If all the polar ice on Earth melts then how will it affect the duration of a day? The duration of a day:
(a) increases **(b)** decreases
(c) remains constant **(d)** Data insufficient

45. An S.H.M is given by $y = 5[\sin(3\pi t) + \sqrt{3}\cos(3\pi t)]$
What is the amplitude of motion?
(a) 5 **(b)** 2.5 **(c)** 20 **(d)** 10

46. A charge q_1 exerts some force on a second charge q_2. If a third charge q_3 is brought near q_2, the force exerted by q_1 on q_2:
(a) decreases **(b)** increases
(c) remains same
(d) increases if q_3 and q_1 are of same sign

47. If power dissipated in the circuit is 150 W, then value of R is:



(a) 2 Ω **(b)** 6 Ω **(c)** 5 Ω **(d)** 4 Ω

48. A circular current carrying coil has radius R. The distance from the centre to a point on the axis of the coil where the magnetic induction is 1/8th of its value at the centre of coil is
(a) $\frac{R}{2\sqrt{3}}$ **(b)** $R\sqrt{3}$ **(c)** $\frac{R}{\sqrt{3}}$ **(d)** $\frac{2R}{\sqrt{3}}$

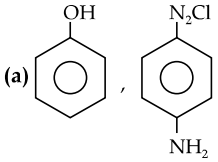
49. In an AC circuit, the current lags behind the voltage by $\pi/3$. The components in the circuit may be
(a) R and L **(b)** R and C **(c)** only L **(d)** only C

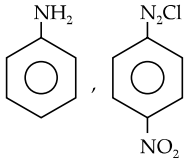
50. The ionization energy of the electron in the hydrogen atom in its ground state is 13.6 eV. The atoms are excited to higher energy levels to emit radiations of 6 wavelengths. Maximum wavelength of emitted radiation corresponds to the transition between
(a) n = 3 and n = 1 states **(b)** n = 2 and n = 1 states
(c) n = 4 and n = 3 states **(d)** n = 3 and n = 2 states

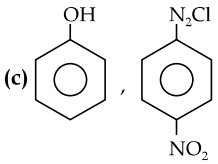
CHEMISTRY

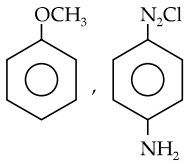
Section A

51. Which of the following pair make fastest coupling reaction in acidic medium?

(a)  ,

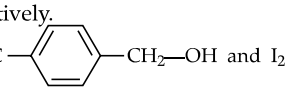
(b)  ,

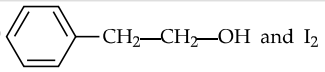
(c)  ,

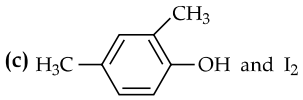
(d)  ,

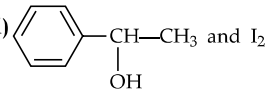
52. Which of the following statements about the composition of the vapour over an ideal 1 : 1 molar mixture of benzene and toluene is correct? Assume that the temperature is constant at 25°C. [Given, vapour pressure data at 25°C, benzene = 12.8 kPa, toluene = 3.85 kPa]
(a) The vapour will contain equal amounts of benzene and toluene.
(b) Not enough information is given to make a prediction.
(c) The vapour will contain a higher percentage of benzene.
(d) The vapour will contain a higher percentage of toluene.

53. Compound A, $C_8H_{10}O$, is found to react with NaOI (produced by reacting Y with NaOH) and yields a yellow precipitate with characteristic smell. A and Y are respectively.

(a) 

(b) 

(c) 

(d) 

54. The hybridizations of atomic orbitals of nitrogen in NO_2^+, NO_3^- and NH_4^+ respectively are:
(a) sp, sp^3 and sp^2 **(b)** sp^2, sp^3 and sp
(c) sp, sp^2 and sp^3 **(d)** sp^2, sp and sp^3

55. The correct difference between first and second order reactions is that:
(a) A first-order reaction can be catalyzed; a second-order reaction cannot be catalyzed.
(b) The half-life of a first-order reaction does not depend on $[A]_0$; the half-life of a second-order reaction does depend on $[A]_0$.
(c) The rate of a first-order reaction does not depend on reactant concentrations; the rate of a second-order reaction does depend on reactant concentrations.
(d) The rate of a first-order reaction does depend on reactant concentrations; the rate of a second-order reaction does not depend on reactant concentrations.

56. Predict the correct intermediate and product in the following reaction.

$$H_3C{-}C{\equiv}CH \xrightarrow[HgSO_4]{H_2O,\ H_2SO_4}$$

Intermediate $\longrightarrow$ Product
(A) (B)

(a) A=$H_3C-\underset{\underset{SO_4}{|}}{C}=CH_2$, B=$H_3C-\underset{\underset{O}{|}}{C}=CH_3$

(b) A=$H_3C-\underset{\underset{OH}{|}}{C}=CH_2$, B=$H_2C-\underset{\underset{SO_4}{|}}{C}=CH_2$

(c) A=$H_3C-\underset{\underset{O}{||}}{C}-CH_3$, B=$H_3C-C\equiv CH$

(d) A=$H_3C-\underset{\underset{OH}{|}}{C}=CH_2$, B=$H_3C-\underset{\underset{O}{||}}{C}-CH_3$

57. The bond dissociation energies of X_2, Y_2 and XY are in the ratio of 1 : 0.5 : 1. ΔH for the formation of XY is – 200 kJ mol^{-1}. The bond dissociation energy of X_2 will be:
(a) 200 kJ mol^{-1} **(b)** 100 kJ mol^{-1}
(c) 800 kJ mol^{-1} **(d)** 400 kJ mol^{-1}

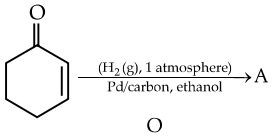
58. The temperature at which the given reaction is at equilibrium
$Ag_2O(s) \rightarrow 2Ag(s) + (1/2)O_2(g)$
ΔH = 30.5 kJ mol^{-1} and ΔS = 0.066 kJ mol^{-1}
(a) 462.12 K **(b)** 362.12 K **(c)** 262.12 K **(d)** 562.12 K

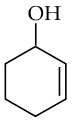
59. Carboxylic acids have higher boiling points than aldehydes, ketones and even alcohols of comparable molecular mass. It is due to their:
(a) More extensive association of carboxylic acid via van der Waals force of attraction.
(b) Formation of carboxylate ion.
(c) Formation of intramolecular H-bonding.
(d) Formation of intermolecular H-bonding.

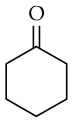
60. The measurement of the electron position is associated with an uncertainty in momentum, which is equal to 1×10^{-18} g cm s^{-1}. The uncertainty in electron velocity is:
[mass of an electron is 9×10^{-28} g]
(a) 1×10^9 cm s^{-1} **(b)** 1×10^6 cm s^{-1}
(c) 1×10^5 cm s^{-1} **(d)** 1×10^{11} cm s^{-1}

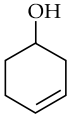
61. The number of structural isomers possible from the molecular formula C_3H_9N is:
(a) 4 **(b)** 5 **(c)** 2 **(d)** 3

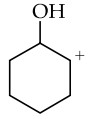
62. The correct structure of the product 'A' formed in the reaction:



(a) 

(b) 

(c) 

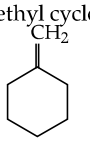
(d) 

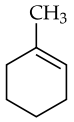
63. Which of the following is least likely to behave as Lewis base?
(a) NH_3 **(b)** BF_3 **(c)** OH^- **(d)** H_2O

64. Which of the following reagents would distinguish *cis*-cyclopenta-1, 2-diol from the *trans*-isomer?
(a) MnO_2 **(b)** Aluminium isopropoxide
(c) Acetone **(d)** Ozone

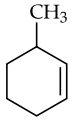
65. 1.0 g of magnesium is burnt with 0.56 g of oxygen in a closed vessel. Which reactant is left in excess and how much ? [At. weight of Mg = 24, O = 16]
(a) Mg, 0.16 g **(b)** O_2, 0.16 g
(c) Mg, 0.44 g **(d)** O_2, 0.28 g

66. In the reaction with HCl, an alkene reacts in accordance with the Markovnikov's rule to give a product 1-chloro-1 methyl cyclohexane. The possible alkene is :

(a) 

(b) 

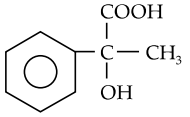
(c) **(a)** and **(b)** both

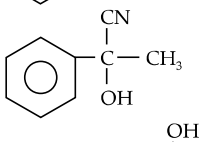
(d) 

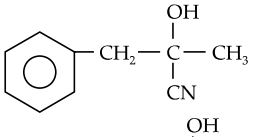
67. Which of the following has longest C—O bond length? [Free C—O bond length in CO is 1.128 Å].
(a) $[Fe(CO)_4]^{2-}$ **(b)** $[Mn(CO)_6]^+$
(c) $Ni(CO)_4$ **(d)** $[Co(CO)_4]^-$

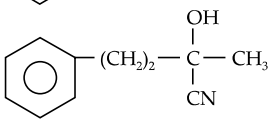
68. Amongst the elements with following electronic configurations, which one may have the highest ionization energy?
(a) [Ne] $3s^2$, $3p^3$ **(b)** [Ne] $3s^2$, $3p^2$
(c) [Ar] $3d^{10}$, $4s^2$, $4p^3$ **(d)** [Ne] $3s^2$, $3p^1$

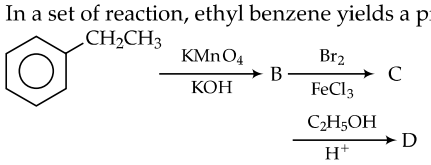
69. In a set of reactions acetic acid yielded a product D.
$CH_3COOH \xrightarrow{SOCl_2} A \xrightarrow[\text{anhy. } AlCl_3]{\text{benzene}} B \xrightarrow{HCN} C \xrightarrow{HOH} D$
The structure of D would be

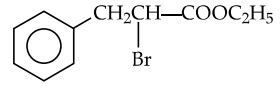
(a) 

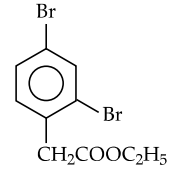
(b) 

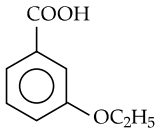
(c) 

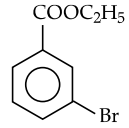
(d) 

70. In a set of reaction, ethyl benzene yields a product D.


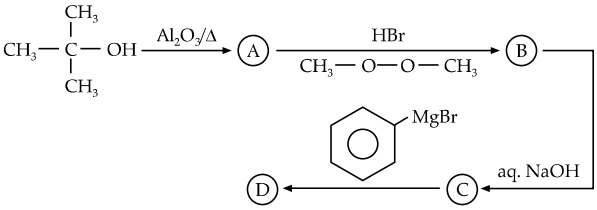
(a) 

(b) 

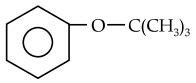
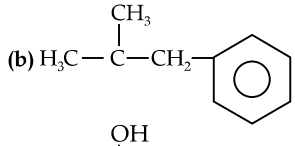
(c) 

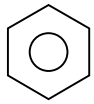
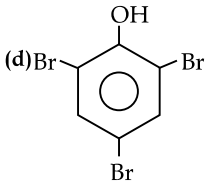
(d) 

71. The segment of DNA which acts as the instrumental manual for the synthesis of the protein is:
(a) ribose **(b)** gene
(c) nucleoside **(d)** nucleotide

72. 

The end product (D) of the reaction is

(a)  (b) 

(c)  (d) 

73. The electrode potentials for

$Cu^{2+}(aq) + e^- \rightarrow Cu^+(aq)$

and $Cu^+(aq) + e^- \rightarrow Cu(s)$

are + 0.15 V and + 0.50 V respectively. The value of $E°Cu^{+2}/Cu$ will be:
(a) 0.325 V **(b)** 0.650 V **(c)** 0.150 V **(d)** 0.500 V

74. The pair of species with the same bond order is
(a) O_2^{2-}, B_2 **(b)** O_2^+, NO^+ **(c)** NO, CO **(d)** N_2, O_2

75. Which of the following processes does not involve oxidation of iron?
(a) Rusting of iron sheets.
(b) Decolourization of blue $CuSO_4$ solution by iron.
(c) Formation of $Fe(CO)_5$ from Fe.
(d) Liberation of H_2 from steam by iron at a high temperature.

76. Consider the following reactions:
(i) $H^+(aq) + OH^-(aq) \rightarrow H_2O(l), -x_1$ kJ mol^{-1}
(ii) $H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l), -x_2$ kJ mol^{-1}
(iii) $CO_2(g) + H_2(g) \rightarrow CO(g) + H_2O(l), -x_3$ kJ mol^{-1}
(iv) $C_2H_2(g) + \frac{5}{2}O_2(g) \rightarrow 2CO_2(g) + H_2O(l), +x_4$ kJ mol^{-1}

Enthalpy of formation of $H_2O(l)$ is:
(a) $-x_2$ kJ mol^{-1} **(b)** $+x_3$ kJ mol^{-1}
(c) $-x_4$ kJ mol^{-1} **(d)** $+x_1$ kJ mol^{-1}

77. The correct order of increasing bond angles in the following species is :
(a) $Cl_2O < ClO_2 < ClO_2^-$
(b) $ClO_2 < Cl_2O < ClO_2^-$
(c) $Cl_2O < ClO_2^- < ClO_2$
(d) $ClO_2^- < Cl_2O < ClO_2$

78. For the reaction, $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$, the equilibrium constant is K_1. The equilibrium constant is K_2 for the reaction,

$2NO(g) + O_2(g) \rightleftharpoons 2NO_2(g)$.

What is K for the reaction,

$NO_2(g) \rightleftharpoons \frac{1}{2}N_2(g) + O_2(g)$?

(a) $1/(4\,K_1K_2)$ **(b)** $[1/K_1K_2]^{1/2}$ **(c)** $1/(K_1K_2)$ **(d)** $1/(2K_1K_2)$

79. A magnetic moment of 1.73 B.M. will be shown by one among the following :
(a) $[Cu(NH_3)_4]^{2+}$ **(b)** $[Ni(CN)_4]^{2-}$
(c) $TiCl_4$ **(d)** $[CoCl_6]^{4-}$

80. Which of the following acid does not exhibit optical isomerism?
(a) Maleic acid **(b)** α-amino acid
(c) Lactic acid **(d)** Tartaric acid

81. Which of the following is the electron deficient molecule?
(a) B_2H_6 **(b)** C_2H_6 **(c)** PH_3 **(d)** SiH_4

82. Which one of the following species does not exist under normal conditions?
(a) Be_2^+ **(b)** Be_2 **(c)** B_2 **(d)** Li_2

83. The hydrogen ion concentration of a 10^{-8} M HCl aqueous solution at 298 K ($K_w = 10^{-14}$) is:
(a) 1.0×10^{-6} M **(b)** 1.0525×10^{-7} M
(c) 9.525×10^{-8} M **(d)** 1.0×10^{-8} M

84. Reaction of HBr with propene in the presence of peroxide gives :
(a) iso-propyl bromide **(b)** 3-bromo propane
(c) allyl bromide **(d)** *n*-propyl bromide

85. In a first order reaction, A ⟶ B, if *k* is rate constant and initial concentration of the reaction A is 0.5 M, then the half-life is:
(a) $\frac{0.693}{0.5k}$ **(b)** $\frac{\log 2}{k}$ **(c)** $\frac{\log 2}{k\sqrt{0.5}}$ **(d)** $\frac{\ln 2}{k}$

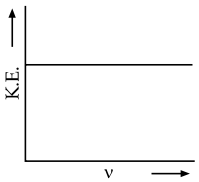
Section B

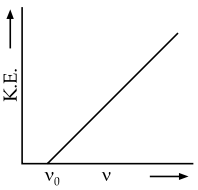
86. Replacement of Cl of chlorobenzene to give phenol requires drastic conditions. But chlorine of 2,4-dinitrochlorobenzene is readily replaced
(a) NO_2 donates electron at meta position
(b) NO_2 withdraws electron from ortho/para positions
(c) NO_2 make ring electron rich at ortho & para position
(d) NO_2 withdraws electron from meta position

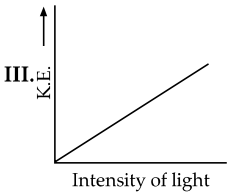
87. The number of electrons in 1.6 g of CH_4 is approximately
(a) 25×10^{24} **(b)** 1.5×10^{24}
(c) 6×10^{23} **(d)** 3.0×10^{24}

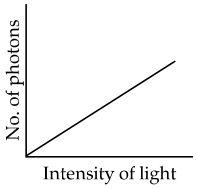
88. pH of pure water at 50°C will be?
(a) pH = 7 **(b)** pH > 7 **(c)** pH ≥ 7 **(d)** pH < 7

89. Which is the correct graphical representation based on photoelectric effect?

I. 

II. 

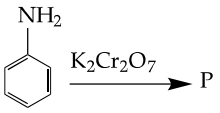
III. 

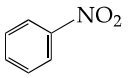
IV. 

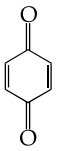
(a) I & II **(b)** II & III **(c)** III & IV **(d)** II & IV

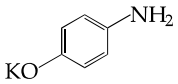
90. Second law of thermodynamics is based on?
(a) Energy conservation **(b)** Entropy
(c) Temperature **(d)** All of these

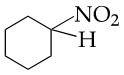
91. Identify the product, P for the following reaction



(a) 

(b) 

(c) 

(d) 

92. **Statement I:** Among halogens, Iodine is the best oxidant.
Statement II: Iodine is the least electronegative atom among halogens.
Choose the correct answer from the given options.
(a) Statement I is incorrect but statement II is true.
(b) Both statement I and statement II are true.
(c) Both statement I and statement II are false.
(d) Statement I is correct but statement II is false.

93. Molal depression constant for a solvent is 4 kg/mol. The depression in the freezing point of solvent for 0.03 mol/kg solution of K_2SO_4 will be:
(a) 0.24 K **(b)** 0.36 K
(c) 0.18 K **(d)** 0.12 K

94. Resistance of 0.2 M solution of an electrolyte is 50Ω. The specific conductance of the solution is 1.4 Sm^{-1}. The resistance of 0.5M solution of the same electrolyte is 280Ω. The molar conductivity of 0.5M solution of the electrolyte is $Sm^2\ mol^{-1}$.
(a) 5×10^{-3} **(b)** 5×10^{2}
(c) 5×10^{3} **(d)** 5×10^{-4}

95. Match list I with list II.

List I	List II
(A) Optical isomerism	(i) $[Co(NH_3)_5SCN]^{2+}$
(B) Coordination isomerism	(ii) $[Cr(H_2O)_3Cl_3]^{3+}$
(C) Geometrical isomerism	(iii) $[Co(en)_3]^{3+}$
(D) Linkage isomerism	(iv) $[Cr(NH_3)_6]\ [Co(CN)_6]$

Choose the correct answer from the given options.
(a) **(A)**-(i), **(B)**-(ii), **(C)**-(iii), **(D)**-(iv)
(b) **(A)**-(iii), **(B)**-(iv), **(C)**-(ii), **(D)**-(i)
(c) **(A)**-(ii), **(B)**-(i), **(C)**-(iii), **(D)**-(iv)
(d) **(A)**-(iv), **(B)**-(ii), **(C)**-(iii), **(D)**-(i)

96. The successive ionization energies for element X is given below
IE_1 : 250 kJ mol^{-1}
IE_2 : 820 kJ mol^{-1}
IE_3 : 1100 kJ mol^{-1}
IE_4 : 1400 kJ mol^{-1}
Find out the number of valence electrons for the element X.
(a) 3 **(b)** 4 **(c)** 2 **(d)** 1

97. Which of the following is the correct increasing order of oxidation number of the given compounds
CrO_3, Fe_2O_3, MnO_2, V_2O_5
(I) (II) (III) (IV)
(a) IV > I > II >III **(b)** I > III > IV >II
(c) I > IV > III >II **(d)** III > II > IV >I

98. The number of S=O bond present in sulphurous acid, peroxodisulphuric acid and pyrosulphuric acid respectively are
(a) 2, 3 and 4 **(b)** 1, 4 and 3
(c) 2, 4 and 3 **(d)** 1, 4 and 4

99. In the structure of ClF_3 the number of lone pair of electrons on central atom 'Cl' is
(a) One **(b)** Two **(c)** Three **(d)** Four

100. Which of the following is the strongest reducing agent?
(a) ASH_3 **(b)** BiH_3
(c) PH_3 **(d)** SbH_3

BOTANY

Section A

101. Which of the following is not stem modification ?
(a) Flattened structures of *Opuntia.*
(b) Pitcher of *Nepenthes.*
(c) Thorns of Citrus.
(d) Tendrils of cucumber.

102. Oxidative phosphorylation:
(a) Formation of ATP energy released from electrons removed during substrate oxidation.
(b) Formation of ATP by transfer of phosphate group from a substrate to ADP.
(c) Oxidation of phosphate group in ATP.
(d) Addition of phosphate group to ATP.

103. Which of the following restriction enzyme produces blunt ends?
(a) *Sal* I **(b)** *Eco* RV
(c) *Xho* I **(d)** *Hind* III

104. Free-central placentation is found in:
(a) *Dianthus* **(b)** *Argemone* **(c)** *Brassica* **(d)** *Citrus*

105. Red list contains data or information on:
(a) Threatened species.
(b) Marine vertebrates only.
(c) All economically Important plants.
(d) Plants whose products are in international trade.

106. Cotyledon of maize grain is called:
(a) Scutellum **(b)** Plumule
(c) Coleorhiza **(d)** Coleoptile

107. Which of the following represent maximum number of species among global biodiversity?
(a) Mosses and ferns **(b)** Algae
(c) Lichens **(d)** Fungi

108. Taylor conducted the experiments to prove semiconservative mode of chromosome replication on:
(a) *Vicia faba* **(b)** *Drosophila melanogaster*
(c) *E. coli* **(d)** *Vinca rosea*

109. In lichen, the fungus provides:
(a) Protection, anchorage and absorption for alga.
(b) Food for alga.
(c) Oxygen for alga.
(d) Fixes nitrogen for alga.

110. Isogamous condition with non-flagellated gametes is found in:
(a) *Fucus* **(b)** *Chlamydomonas*
(c) *Spirogyra* **(d)** *Volvox*

111. Which stage of meiosis is the longest phase of prophase I and can last for months or years in the oocytes of some vertebrates?
(a) Diakinesis **(b)** Leptotene
(c) Pachytene **(d)** Diplotene

112. How many meiotic divisions are required to produce 120 seeds in an angiospermic plant?
(a) 30 **(b)** 120 **(c)** 150 **(d)** 60

113. Read the following statements and select the correct option.
Statement A: *Nostoc* has pellicle as its outermost covering.
Statement B: All cyanobacteria lack cell wall.
(a) Only statement A is incorrect.
(b) Only statement B is incorrect.
(c) Both statements A and B are correct.
(d) Both statements A and B are incorrect.

114. The back cross can distinguish heterozygotes from homozygotes as they give ..... phenotypic ratio respectively :
(a) 1:1 dominant: recessive ; all recessive.
(b) 1:1 recessive; dominant; all dominant.
(c) All dominant; all dominant.
(d) All dominant; 1:1 recessive: dominant.

115. Which one of the following does not follow the central dogma of molecular biology?
(a) *Mucor* **(b)** *Chlamydomonas*
(c) HIV **(d)** Pea

116. Number of CO_2 acceptor and carboxylating enzyme in C_4 plants are
(a) 2, 2 respectively. **(b)** 1, 1 respectively.
(c) 2, 1 respectively. **(d)** 1, 2 respectively.

117. Agarose extracted from seaweeds is used in:
(a) Spectrophotometry **(b)** Tissue culture
(c) PCR **(d)** Gel electrophoresis

118. How many documented varieties of Basmati are grown in India?
(a) 2,00,000 **(b)** 25 **(c)** 27 **(d)** 13

119. The Avena curvature is used for bioassay of:
(a) ABA **(b)** GA_3
(c) IAA **(d)** Ethylene

120. A vesselless piece of stem possessing sieve cells belong to:
(a) Mango **(b)** *Eucalyptus*
(c) Grass **(d)** *Pinus*

121. Cyanobacteria have:
(a) Both PS I and PS II.
(b) Only PS I.
(c) Only PS II.
(d) PS II in heterocyst only.

122. Macromolecule chitin is:
(a) Phosphorus containing polysaccharide.
(b) Sulphur containing polysaccharide.
(c) Simple polysaccharide.
(d) Nitrogen containing polysaccharide.

123. Which is wrong for viroids?
(a) Their RNA is of high molecular weight.
(b) They lack a protein coat.
(c) They are smaller than viruses.
(d) They cause infections.

124. In mitochondria, protons accumulate in:
(a) Outer membrane
(b) Intermembrane space
(c) Inner membrane
(d) Matrix

125. The histones are:
(a) Negatively charged proteins.
(b) Absent in eukaryotes.
(c) Rich in lysines and arginines.
(d) Found in *E. coli.*

126. Rearrange the following events of sexual reproduction in the sequence they occur in a flowering plant: Embryogenesis, Fertilisation, Pollination.
(a) Pollination, Embryogenesis, Fertilisation.
(b) Embryogenesis, Pollination Fertilisation.
(c) Pollination, Fertilisation, Embryogenesis.
(d) Embryogenesis, Fertilisation, Pollination.

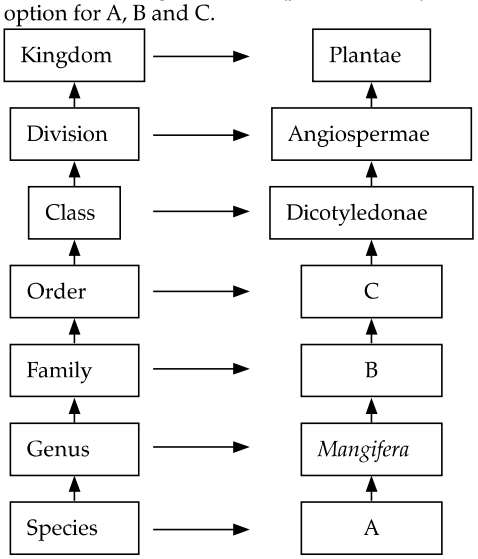
127. When does saturation occur in an enzymatic reaction?
(a) When the energy from a high-energy bond is required to move molecules.
(b) When a group of carrier proteins is operating at its maximum rate.
(c) When a carrier molecule has the ability to transport only one molecule or a group of closely related molecules.
(d) When molecules are moved by the use of vesicles.

128. Long pericentric inversions generally don't act as cross over suppressors, because:
(a) Cross over product in this is viable.
(b) Mechanism is different for short and long inversions.
(c) Two events of crossing over take place.
(d) Long stretches of DNA recombination not recognized.

129. Discontinuous synthesis of DNA occurs in one strand because:
(a) DNA molecule being synthesized is very long.
(b) DNA dependent DNA polymerase catalyses polymerisation only in one direction ($5' \rightarrow 3'$).
(c) It is a more efficient process.
(d) DNA ligase joins the short stretches of DNA.

130. Cristae in mitochondria is the site of:
(a) Breakdown of food materials.
(b) Photophosphorylation.
(c) Oxidation - reduction reaction.
(d) Krebs' cycle.

131. The given flow chart represents the hierarchy of various taxonomic categories of a plant. Identify the correct option for A, B and C.



(a) A - *indica*, B - Anacardiaceae, C - Sapindales
(b) A - *carica*, B - Caricaceae, C - Brassicales
(c) A - *indica*, B - Bromeliaceae, C - Poales
(d) A - *aestivum*, B – Lauraceae, C- Laurales

132. Which one are the special form of chromosome found in the growing/ immature oocytes of majority of animals, except mammals?
(a) B chromosome.
(b) Lampbrush chromosome.
(c) Accessory chromosome.
(d) Polytene chromosome.

133. A colour-blind man marries a woman, who is homozygous for normal colour vision, the probability of their son being colour blind is –
(a) 0% **(b)** 25% **(c)** 50% **(d)** 100%

134. The F_1 generation is determined by crossing P/P with p/p. Then the progeny obtained from them were intercrossed. What will be the ratio of pure breeding flowers to not pure breeding flowers in F_2:
(a) 1:1 pure: non-pure **(b)** 3:1 pure: non-pure
(c) 1:3 pure: non-pure **(d)** 1:2 pure: non-pure

135. This is analogous to mesosomes of bacteria:
(a) Golgi apparatus of eukaryotes.
(b) Lysosomes of eukaryotes.
(c) Mitochondria of eukaryotes.
(d) None of the above.

Section B

136. Which one of the following statements is incorrect?
(a) The relation between species richness and area for a wide variety of taxa turns out to be a rectangular hyperbola.
(b) The relation between species richness and area on a logarithmic scale, the relationship is a straight line.
(c) For the species-area relationships among very large areas like the entire continents, the slope of the line appears to be much steeper.
(d) Value of Z always keep on changing for every taxonomic group or the region.

137. Which of the following is incorrectly matched?
(a) Dedifferentiated – Interfascicular cambium medullary cells.
(b) Heart wood – Highly lignified walls and nonconductive.
(c) Vascular cambium – Partly primary in origin in dicot root.
(d) Lenticels – Lens shaped openings for gaseous exchange.

138. What is induced by a low ratio of cytokinin to auxin induces in plants?
(a) rooting **(b)** shooting
(c) bud formation **(d)** flowering

139. If the genes are located in a chromosome as a-b-c-d-e, which of the following gene pairs will have least probability of being inherited together?
(a) a and b **(b)** c and d **(c)** d and e **(d)** a and d

140. The common nitrogen fixer in paddy fields is:
(a) *Frankia* **(b)** *Rhizobium*
(c) *Azospirillum* **(d)** *Oscillatoria*

141. Vegetative propagation in *Pistia* occurs by :
(a) Stolon **(b)** Offset **(c)** Runner **(d)** Sucker

142. How does Angiosperms differ from Gymnosperms?
(a) Vessels in wood
(b) Autotrophic Mode of nutrition
(c) Siphonogamy
(d) Enclosed seed

143. Read the names of the amino acids given below.

Lysine, Glycine, Glutamate, Alanine, Valine, Arginine, Histidine, Aspartate

How many of the above are neutral and basic amino acids, respectively.
(a) 3, 3 **(b)** 3, 5 **(c)** 6, 2 **(d)** 7, 1

144. Select the incorrect match:

	Term	Coined By
(a)	Genetics	William Bateson
(b)	Genotype	Gregor Johann Mendel
(c)	Phenotype	Wilhelm Johannsen
(d)	Linkage	T.H. Morgan

145. Fungi like Protista are commonly called
(a) Myxomycetes **(b)** Ascomycetes
(c) Basidiomycetes **(d)** Deuteromycetes

146. The term used for the process by which living organisms are thought to develop from inanimate matter.
(a) Biogenesis **(b)** Neoteny
(c) Retrogression **(d)** Biopoiesis

147. _____ is a botanical box or a stiff container which is used by botanists to keep field plant samples viable for transportation.
(a) Vasculum **(b)** Herbarium
(c) Arboretum **(d)** Collector box

148. Read the following statements and select the correct option.
Statement A: One gene-one enzyme hypothesis suggest that each gene is responsible for producing a single enzyme.
Statement B: This hypothesis was proposed by Beadle and George wells.
(a) Only statement A is incorrect.
(b) Only statement B is incorrect.
(c) Both statements A and B are incorrect.
(d) Both statements A and B are correct.

149. Observe the following table carefully and choose the correct option for A, B, C and D.

Characters	Monera	Protista	Fungi	Plantae	Animalia
Chloroplast	A	Present or Absent	Absent	Present	Absent
Motility	Present (flagella) or Absent	B	Present	Present	Present
Complexity of body	Unicellular	C	Unicellular to Multicellular	Multicellular	Multicellular
Cell Wall	D	Present or Absent	Chitin	Cellulose	Absent

	A	B	C	D
(a)	Absent	Absent	Unicellular	Murmuric acid
(b)	Present	Present	Multicellular	Glycogen
(c)	Present	Present	Unicellular	Non-cellulosic and Peptidoglycan
(d)	Present	Present	Multicellular	Cellulosic

150. Which one of the following plants is correctly matched with its particular class?

(a) Psilophyta - *Equisetum* **(b)** Lycophyta - *Rhynia*
(c) Arthrophyta - *Dryopteris* **(d)** Pterophyta - *Marsilea*

ZOOLOGY

Section A

151. In a standard ECG which one of the following alphabets is the correct representation of the respective activity of the human heart:
(a) P-depolarization of the atria.
(b) R-repolarization of ventricles.
(c) S-start of systole.
(d) T-end of diastole.

152. Several hormones like *h*CG, *h*PL, oestrogen, progesterone are produced by:
(a) Ovary **(b)** Placenta
(c) Fallopian tube **(d)** Pituitary

153. Injury localized to the hypothalamus would most likely disrupt.
(a) Short-term memory.
(b) Co-ordination during locomotion.
(c) Executive functions, such as decision making.
(d) Regulation of body temperature.

154. Which one is correctly matched?
(a) Down's syndrome – 44 autosomes + XO
(b) Klinefelter's syndrome – 44 autosomes + XXY
(c) Erythroblastosis foetails – X linked
(d) Colour blindness - Y linked

155. Glisson's Capsule is an exclusive feature of
(a) Aves **(b)** Reptilia
(c) Amphibia **(d)** Mammalia

156. Which of the following is not an organ of lymphatic system?
(a) Lymph nodes **(b)** Spleen
(c) Thymus **(d)** Kidney

157. Earthworm body is covered externally by a thin, non-cellular layer called
(a) Body wall **(b)** Epidermis
(c) Coelomic epithelium **(d)** Cuticle

158. The two polypeptides of human insulin are linked together by:
(a) Phosphodiester bond **(b)** Covalent bond
(c) Disulphide bridges **(d)** Hydrogen bonds

159. Choose the correct statement :
(a) No receptors respond to changes in pressure.
(b) Meissner's corpuscles are thermoreceptors.
(c) Photoreceptors in the human eye are depolarized during darkness and become hyperpolarised in response to the light stimulus.
(d) Receptors do not produce graded potentials.

160. The pitch of *ds*B-DNA would be :
(a) 3.4 Å **(b)** 0.34 Å **(c)** 34 Å **(d)** 34 nm

161. In which one of the following, the genus name, its two characters and its phylum are not correctly matched ?

	Genus name	Two characters	Phylum
(a)	*Gorgonia*	Presence of stinging capsules, Central gastovascular cavity	*Coelenterate*
(b)	*Ancylostoma*	Pseudocoelom Often, longer females than males	Aschel-minthes
(c)	*Bombyx*	Jointed appendages, Metamerism	Arthropoda
(d)	*Cucumaria*	Water canal system, Calcareous exoskeleton	*Echinodermata*

162. Select the correct match:
(a) Gravidex Test – Plague
(b) Mantoux Test – Tuberculosis
(c) VDRL – Cholera
(d) WIDAL – Syphilis

163. Name the blood cells whose reduction in number can cause clotting disorder leading to excessive loss of blood from the body.
(a) Erythrocytes **(b)** Leucocytes
(c) Neutrophils **(d)** Thrombocytes

164. Select the correct pairing of homologous pairing of male and female reproductive part:

	Male	Female
(a)	Prostate gland	Clitoris
(b)	Scrotum	Labia minora
(c)	Seminal vesicle	Skene's gland
(d)	Cowper's gland	Bartholin's gland

165. Which of the following are correctly matched with respect to their taxonomic classification?
(a) Flying fish, cuttlefish, silverfish - Pisces
(b) Centipede, millipede, spider, scorpion – Insecta
(c) House fly, butterfly, tsetse fly, silver fish - Insecta
(d) Spiny anteater, sea urchin, sea cucumber –Echinodermata

166. The hepatic portal vein drains blood to liver from:
(a) Heart **(b)** Stomach
(c) Kidneys **(d)** Intestine

167. Which valve guards the left atrioventricular aperture?
(a) Tricuspid valve **(b)** Eustachian valve
(c) Bicuspid valve **(d)** Semilunar valve

168. Collagen is:
(a) Globular protein
(b) Fibrous protein
(c) Carbohydrate
(d) Quaternary structured protein

169. The part of urethra which is shortest in length is:
(a) Penile urethra **(b)** Prostatic urethra
(c) Membranous urethra **(d)** Seminal urethra

170. Which one of the following is not a part of a renal pyramid?
(a) Peritubular capillaries
(b) Convoluted tubules
(c) Collecting ducts
(d) Loop of Henle

171. Asthma may be attributed to:
(a) Allergic reaction of the mast cells in the lungs.
(b) Inflammation of trachea.
(c) Accumulation of fluid in lungs.
(d) Bacterial infection of the lungs.

172. A patient brought to a hospital with myocardial infarction is normally immediately given:
(a) Cyclosporin A **(b)** Statins
(c) Penicillin **(d)** Streptokinase

173. Age-related disorder characterised by decreased bone mass is :
(a) Gout **(b)** Myasthenia gravis
(c) Oseteoporosis **(d)** Muscular dystrophy

174. Eustachian tube connects:
(a) Oesophagus with pharynx
(b) Middle ear with oesophagus
(c) Pharynx with middle ear
(d) Middle ear with internal ear

175. During pregnancy the level of glucose in the maternal blood increases due to:
(a) *h*CG **(b)** *h*CS
(c) Epinephrine **(d)** Glucagon

176. Which of the following parts of the brain regulates the respiratory process :
(a) Medulla oblongata **(b)** Cerebellum
(c) Hippocampal lobe **(d)** Vagus nerve

177. Over-twisting of a molecule results in _____ :
(a) Positive supercoiling
(b) Compression
(c) Elongation
(d) Negative supercoiling

178. What is the name of the hypervariable region of immunoglobin, which is responsible for its diversity :
(a) Hinge region
(b) Complementarity-determining regions (CDRs)
(c) Epitope
(d) Agretope

179. Select the incorrect match regarding part of skeleton and number of bones associated.
(a) Ear ossicles-6 **(b)** Hyoid bone-1
(c) Axial skeleton-80 **(d)** Cranium-14

180. What is the site of haemopoiesis in an embryo:
(a) Liver **(b)** Thymus **(c)** Yolk sac **(d)** Spleen

181. The genotypes of a Husband and Wife are I^AI^B and I^Ai.
Among the blood types of their children, how many different genotypes and phenotypes are possible:
(a) 3 genotypes ; 3 phenotypes
(b) 3 genotypes; 4 phenotypes
(c) 4 genotypes; 3 phenotypes
(d) 4 genotypes; 4 phenotypes

182. Read the given properties carefully.
(1) Hormones are non-antigenic.
(2) Hormones can act in very low concentration.
(3) Hormones have low molecular weight.
(4) Hormone controlled reactions are irreversible.
(5) Hormones have cumulative effect.
How many of the above are the correct properties of hormones.
(a) 3 **(b)** 1 **(c)** 4 **(d)** 2

183. _____ is an abnormal individual, especially an insect, having some male and some female characteristics.
(a) Gynandromorph **(b)** Monomorph
(c) Gynomorph **(d)** Holomorph

184. Match Column I with Column II.

Column I (Terms)	Column II (Discovered By)
(A) Prostaglandin	(i) Ulf von Euler
(B) Homeostasis	(ii) Starling
(C) Secretin	(iii) Thomas Wharton
(D) Thyroid	(iv) Walter B. Cannon

Choose the correct answer from the options given below:

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

185. When a linker histone protein binds to a nucleosome, _____ structure will form.
(a) Chromosome **(b)** Interbead
(c) Chromatin **(d)** Chromatosome

Section B

186. If 20 J of energy is trapped at producer level, then how much energy will be available to peacock as food in the following chain
Plant → Mice → Snake → Peacock
(a) 0·02 J **(b)** 0·002 J **(c)** 0·2 J **(d)** 0·0002 J

187. If a person slips from the staircase and breaks his ankle bone, which bones are involved?
(a) Carpals **(b)** Tarsal
(c) Metacarpals **(d)** Metatarsals

188. A portion between _____ is called sarcomere.
(a) 'Z' lines **(b)** 'H' lines **(c)** 'I' bands **(d)** 'A' bands

189. Which particulate size is most harmful?
(a) 1.0 µm or less **(b)** 1.5 µm or less
(c) 2.5 µm or less **(d)** 5.2 µm – 2.5 µm

190. Two friends are eating together on a dining table. One of them suddenly starts coughing while swallowing some food. This coughing would have been due to improper movement of:
(a) Epiglottis **(b)** Diaphragm
(c) Neck **(d)** Tongue

191. Genetic drift operates in:
(a) Small isolated population.
(b) Large isolated population.
(c) Non-reproductive population.
(d) Slow reproductive population.

192. The breakdown of detritus into small particles by earthworm is a process called:
(a) Mineralisation **(b)** Catabolism
(c) Humification **(d)** Fragmentation

193. Which of the given organisms have maximum life-span?
(a) Elephant **(b)** Parrot
(c) Banyan tree **(d)** Cow

194. Graft rejection in transplantation of organs is mainly responsible because of
(a) Cell-mediated response
(b) Inability of recipient to differentiate between 'self' and 'non-self' tissues/cells
(c) Humoral immune response only
(d) Auto-immune response

195. Select the incorrect feature for Neanderthal man:
(a) Slightly prognathous face.
(b) True predator.
(c) Adapted to cold environment.
(d) Knuckle walker.

196. Which of the following is transported in intestinal epithelial cells by Na^+- dependent co-transport process?
(a) Fatty acids **(b)** Triglycerides
(c) Ribose **(d)** Alanine

197. Select the incorrect statement from the following:
(a) Apophysis is a normal developmental outgrowth of a bone, especially found on vertebrae.
(b) Apophysis is found where major tendons and ligaments attach to bone.
(c) Apophysis usually forms a direct articulation with another bone at a joint.
(d) Apophysis can also be the site of muscle attachment to the margin of the ilium.

198. Forelimbs of cat, lizard used in walking; forelimbs of whale used in swimming and forelimbs of bats used in flying are an example of:
(a) Analogous organs
(b) Adaptive radiation
(c) Homologous organs
(d) Convergent evolution

199. Select the correct match:

	Coagulation factor Number	Name
(a)	VII	Christmas factor
(b)	IX	Fibrin stabilising factor
(c)	XII	Hageman factor
(d)	XIII	Stable factor

200. Rupturing of follicles and discharge of ova is known as
(a) capacitation **(b)** gestation
(c) ovulation **(d)** copulation