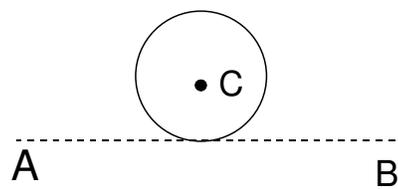


**IMPORTANT INSTRUCTIONS :**

- ☞ **Pattern of the Entrance Examination :**  
Paper containing 180 objective type questions from Biology, Physics and Chemistry.
- ☞ **Use Blue/Black Ball Point Pen only** to darken the appropriate circle. Answers marked with pencil would not be evaluated.
- ☞ Each item carries **4marks**. For each correct response the candidate will get 4 marks. For each incorrect response **1mark** will be deducted from the total score.

**PHYSICS :**

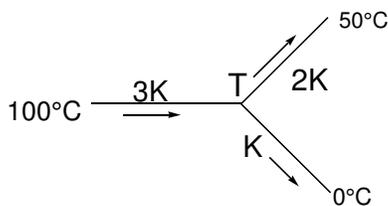
1. If  $\vec{a}_1$  and  $\vec{a}_2$  are two non collinear unit vectors and if  $|\vec{a}_1 + \vec{a}_2| = \sqrt{3}$ , then the value of  $(\vec{a}_1 - \vec{a}_2) \cdot (2\vec{a}_1 + \vec{a}_2)$  is
  - 1) 2
  - 2) 1
  - 3) 1/2
  - 4) 3
2. Electromagnetic wave theory proposed by
  - 1) Newton
  - 2) Huygens
  - 3) Maxwell
  - 4) Debroglie
3. A ball of mass 'm' approaches a wall of mass  $M(\gg m)$  with speed 4 m/s along the normal to the wall. The speed of wall is 1 m/s towards the ball. The speed of the ball after an elastic collision with the wall is
  - 1) 5 m/s away from the wall
  - 2) 9 m/s away from the wall
  - 3) 3 m/s away from the wall
  - 4) 6 m/s away from the wall
4. A body is projected vertically upwards at time  $t=0$  and it is seen at a height 'H' at time  $t_1$  and  $t_2$  seconds during its flight. The maximum height attained is (g is acceleration due to gravity)
  - 1)  $\frac{g(t_2 - t_1)^2}{8}$
  - 2)  $\frac{g(t_1 + t_2)^2}{4}$
  - 3)  $\frac{g(t_1 + t_2)^2}{8}$
  - 4)  $\frac{g(t_2 - t_1)}{8}$

5. A canon shell fired breaks into two equal parts at its highest point. One part retraces the path to the cannon with kinetic energy  $E_1$  and kinetic energy of the second part is  $E_2$ : Relation between  $E_1$  and  $E_2$  is
  - 1)  $E_2 = 15E_1$
  - 2)  $E_2 = E_1$
  - 3)  $E_2 = 4E_1$
  - 4)  $E_2 = 9E_1$
6. A thin wire of length  $l$  having linear density  $\rho$  is bent into a circular loop with C as its centre, as shown in figure. The moment of inertia of the loop about the line AB is
 

- 1)  $\frac{5\rho l^2}{16\pi^2}$
- 2)  $\frac{\rho l^2}{16\pi^2}$
- 3)  $\frac{\rho l^2}{8\pi^2}$
- 4)  $\frac{3\rho l^3}{8\pi^2}$

7. Lenz's law is conservation of
  - 1) Momentum
  - 2) Charge
  - 3) Both 1 and 2
  - 4) Energy

8. If two soap bubbles of different radii are connected by a tube, then :
- 1) Air flows from bigger bubble to the smaller bubble till sizes become equal
  - 2) Air flows from bigger bubble to the smaller bubble till sizes are interchanged
  - 3) Air flows from smaller bubble to bigger
  - 4) There is no flow of air
9. Three rods of same dimensions have thermal conductivities  $3K$ ,  $2K$  and  $K$ . They are arranged as shown in the figure below :



Then the temperature of the junction in steady state is :

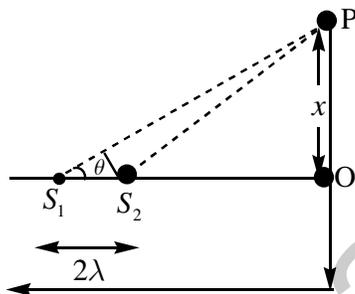
- 1)  $\frac{200}{3}^{\circ}\text{C}$
  - 2)  $\frac{100}{3}^{\circ}\text{C}$
  - 3)  $75^{\circ}\text{C}$
  - 4)  $\frac{50}{3}^{\circ}\text{C}$
10. The percentage of quantity of a radioactive material that remains after 5 half lives will be
- 1) 31%
  - 2) 3.125%
  - 3) 0.3%
  - 4) 1%
11. The focal lengths of the objective and the eyepiece of a compound microscope are 2.0 cm and 3.0 cm respectively. The distance between the objective and the eyepiece is 15.0 cm. The final image formed by the eyepiece is at infinity. Find the distance of object and image produced by the objective, from the objective lens.
- 1) 2.4 cm, 12 cm
  - 2) 12 cm, 2.4 cm
  - 3) 1.4 cm, 6 cm
  - 4) 6 cm, 1.4 cm

12. Two thin symmetrical lenses of different nature and of different material have equal radii of curvature  $R = 15$  cm. The lenses are immersed in water and put close together ( $\mu_w = \frac{4}{3}$ ). The focal length of the system in water is 30 cm. The difference between refractive indices of the two lenses is
- 1)  $\frac{1}{2}$
  - 2)  $\frac{1}{4}$
  - 3)  $\frac{1}{3}$
  - 4)  $\frac{3}{4}$
13. When two cells (of equal e.m.f 2V) are connected either in series or in parallel across a ' $1.2\Omega$ ' resistor, they send the same current through it. The internal resistance of each cell is
- 1)  $2\Omega$
  - 2)  $1.2\Omega$
  - 3)  $12\Omega$
  - 4)  $21\Omega$
14. For a certain metal, the threshold frequency is  $f_0$ . If a light of frequency  $2f_0$  is incident on it, the electrons come out with maximum velocity of  $4 \times 10^6$  m/s. If light of frequency  $5f_0$  is incident on it, the maximum velocity of electrons will be
- 1)  $2 \times 10^6$  m/s
  - 2)  $6 \times 10^6$  m/s
  - 3)  $1 \times 10^6$  m/s
  - 4)  $8 \times 10^6$  m/s
15. The input resistance of a common emitter amplifier is  $200\Omega$  and load resistance is  $2k\Omega$ . A change of base current by  $10\mu\text{A}$  results in the change of collector current by 10mA. Its voltage gain is
- 1) 100
  - 2) 500
  - 3) 10000
  - 4) 5000
16. Davisson-Germer experiment verified
- 1) wave nature of light
  - 2) particle nature of light
  - 3) wave nature of electron
  - 4) particle nature of electron



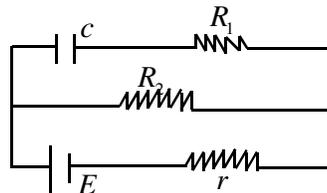
28. To convert galvanometer into ammeter
- 1) Small resistance connected in parallel
  - 2) Large resistance connected in parallel
  - 3) Small resistance in series
  - 4) Large resistance in series

29. Two coherent point sources  $S_1$  and  $S_2$  vibrating in phase emit light of wavelength  $\lambda$ . The separation between them is  $2\lambda$  as shown in figure. The first bright fringe is formed at 'P' due to interference on a screen placed at a distance 'D' from  $S_1$  ( $D \gg \lambda$ ), then OP is



- 1)  $\sqrt{2}D$
  - 2)  $1.5D$
  - 3)  $\sqrt{3}D$
  - 4)  $2D$
30. A spherical conductor of radius 2m is charged to a potential of 120V. It is now placed inside another hollow spherical conductor of radius 6m. Calculate the potential of bigger sphere if the smaller sphere is made to touch the bigger sphere
- 1) 120V
  - 2) 60V
  - 3) 80V
  - 4) 40V

31. The numerical value of the charge on either plates of capacitor 'C' as shown in the figure is



- 1) CE
  - 2)  $\frac{CER_1}{R_1 + r}$
  - 3)  $\frac{CER_2}{R_2 + r}$
  - 4)  $\frac{CER_1}{R_2 + r}$
32. How many  $\alpha$  and  $\beta$ -particles are emitted when uranium nucleus ( ${}_{92}U^{238}$ ) decay to  ${}_{82}P^{214}$ ?
- 1)  $2\alpha, 6\beta$
  - 2)  $6\alpha, 2\beta$
  - 3)  $4\alpha, 4\beta$
  - 4)  $3\alpha, 3\beta$
33. An electron and a photon, each has a de-Broglie wavelength of  $1.2 \text{ \AA}$ . The ratio of their energies will be
- 1) 1:1
  - 2) 1:10
  - 3) 1:100
  - 4) 1:1000
34. Three waves from different sources but having same intensity but frequencies  $(n-1), n$  and  $(n+1)$  super impose. The number of beats per second will be
- 1) 0
  - 2) 1
  - 3)  $3/2$
  - 4) 2
35. Two lamps one rated 100 W at 220 V and other 60 W at 220V are connected in parallel to a 220 V supply. Current drawn from the supply line is
- 1) 0.73 A
  - 2) 1.46 A
  - 3) 0.365 A
  - 4) zero

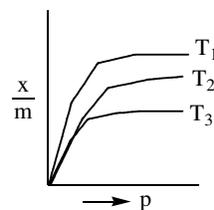
36. The height at which acceleration due to gravity becomes  $g/9$  (where  $g$  = acceleration due to gravity on the surface of the earth) in terms of  $R$ , the radius of the earth is
- 1)  $R$       2)  $\sqrt{2}R$       3)  $2R$       4)  $\frac{R}{\sqrt{2}}$
37. A particle having a mass of  $0.5\text{kg}$  is projected with a speed of  $98\text{ ms}^{-1}$  at an angle of  $60^\circ$  with vertical. The magnitude of change of momentum of the particle after 10 seconds in  $\text{N-sec}$  is
- 1)  $0.5$       2)  $49$       3)  $98$       4)  $490$
38. A rain drop reaching the ground with terminal velocity has momentum  $P$ . Another drop of twice the radius also reaching the ground with terminal velocity, will have momentum of
- 1)  $4P$       2)  $8P$       3)  $16P$       4)  $32P$
39. When ray of light is incident on a glass slab at an angle of  $30^\circ$ , the reflected ray is plane polarized. The refractive index of the glass is \_\_\_\_
- 1)  $1.732$       2)  $0.577$   
3)  $1.5$       4)  $0.866$
40. An  $\alpha$ -particle and a deuteron ( $H_1^2$ ) are accelerated from rest by a potential difference of  $100\text{V}$ . If  $\lambda_1$  and  $\lambda_2$  are their respective de - Broglie wavelengths then  $\frac{\lambda_1}{\lambda_2}$  is
- 1)  $1 : 2$       2)  $2 : 1$   
3)  $1 : 2\sqrt{2}$       4)  $2\sqrt{2} : 1$
41. A gas undergoes a process in which the pressure and volume are related by  $VP^n = \text{constant}$ . The bulk modulus of the gas is
- 1)  $nP$       2)  $P^{1/n}$   
3)  $P/n$       4)  $P^n$
42. Magnetic flux varies with time given by  $\phi = 3t^2 - 4t$  then induced emf at  $t = 2\text{ sec}$
- 1)  $8\text{ volts}$       2)  $6\text{ volts}$   
3)  $10\text{ volts}$       4)  $16\text{ volts}$
43. A charged particle entering in uniform magnetic field its velocity is parallel to field then force acting on the charged particle
- 1)  $qVB$       2)  $\frac{qVB}{2}$   
3)  $0$       4)  $\frac{qVB}{4}$
44. Modulation factor or modulation index ( $m_a$ ) in AM is
- 1)  $\frac{E_{\max} - E_{\min}}{E_{\max} + E_{\min}}$       2)  $\frac{E_{\max} + E_{\min}}{E_{\max} - E_{\min}}$   
3)  $E_{\max} - E_{\min}$       4)  $\frac{E_{\min} - E_{\max}}{E_{\max} + E_{\min}}$
45. A wire of resistance  $2\Omega$  without stretching its length is doubled then new resistance the wire is
- 1)  $8\Omega$       2)  $4\Omega$   
3)  $2\Omega$       4)  $6\Omega$

## CHEMISTRY :

46. The maximum number of electrons in an atom that can have the quantum numbers  $n = 4, m = +1$
- 1) 3      2) 6      3) 5      4) 4
47. Bond order of  $N_2^+, N_2^-$  and  $N_2$  will be
- 1) 2.5, 2.5 and 3 respectively  
2) 2, 2.5 and 3 respectively  
3) 3, 2.5 and 3 respectively  
4) 2.5, 2.5 and 2.5 respectively
48. A mixture of zinc blende and galena are subjected to froth flotation. The depressant used in the process is
- 1) Cresol                      2) Pine oil  
3) Sodium cyanide      4) Xanthate
49. The number of  $OH^-$  ions in 1 mL of the solution having pH = 4 is:
- 1)  $10^{-4}$                       2)  $10^{-10}$   
3)  $6.02 \times 10^{10}$           4)  $6.02 \times 10^{13}$
50. In which of the following emf of galvanic cell is maximum
- 1)  $Mg / Mg_{(1M)}^{2+} // 2Cl_{(1M)}^- / Cl_2 \cdot pt$   
2)  $Mg / Mg_{(0.01M)}^{2+} // 2Cl_{(1M)}^- / Cl_2 \cdot pt$   
3)  $Mg / Mg_{(1M)}^{2+} // 2Cl_{(0.01M)}^- / Cl_2 \cdot pt$   
4)  $Mg / Mg_{(0.01M)}^{2+} // 2Cl_{(0.01M)}^- / Cl_2 \cdot pt$
51. In a  $H_2-O_2$  fuel cell to produce four faradays of electricity, the volume of gas undergoing oxidation at anode is
- 1) 11.2 lit at STP  
2) 33.6 lit at STP  
3) 22.4 lit at STP  
4) 44.8 lit at STP
52. The compressibility factor for a real gas at high pressure is
- 1) 1                              2)  $1 + \frac{b}{V}$   
3)  $1 - \frac{Pb}{RT}$                       4)  $1 + \frac{RT}{Pb}$
53. Waste water drained out of an agricultural field has 0.1%  $PO_4^{3-}$  by mass. Number of  $PO_4^{3-}$  ions in 1kg of the waste water (N=Avogadro number)
- 1) N      2)  $\frac{N}{10}$       3)  $\frac{N}{100}$       4)  $\frac{N}{95}$
54. Consider the reactions
- i.  $PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$ ;  
ii.  $N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$ ;
- The addition of an inert gas at constant volume:
- 1) Will increase the dissociation of  $PCl_5$  as well as  $N_2O_4$   
2) will reduce the dissociation of  $PCl_5$  as well as  $N_2O_4$   
3) Will increase the dissociation of  $PCl_5$  and step up the formation of  $NO_2$   
4) Will not disturb the equilibrium of the reactions
55. 1M  $NH_4OH$  and 1M  $HCl$  are mixed to make total volume of 300ml buffer. If  $p^H$  of the mixture is 9.26 and  $pK_a(NH_4^+) = 9.26$  then volume ratio of  $NH_4OH$  and  $HCl$  will be
- 1) 1 : 1                      2) 1 : 2  
3) 2 : 1                      4) 3 : 1
56. The entropy change involved in the conversion of 1 mole of liquid water at 373 K to vapour at the same temperature will be given  $\Delta H = 2.257$  KJ / gm
- 1) 0.119KJ                      2) 0.109 KJ  
3) 0.129 KJ                      4) 0.140 KJ

57. Solubility of sodium chloride in 100gm water at 273K is  $x$ . Then solubility of  $\text{CaCl}_2$  under similar conditions is
- $x$
  - $>x$
  - $<x$
  - $x/2$
58. Transparent soaps made by dissolving soap in
- rosin
  - sodium carbonate
  - trisodium phosphate
  - ethanol
59. Total number of  $-\text{OH}$  groups that are associated with the structure of sucrose are
- 10
  - 8
  - 6
  - 12
60. The equilibrium constant for a reaction is 10. What will be the value of  $\Delta G^0$  at 300K?
- $-57.44 \text{ kJ/mol}$
  - $-5.744 \text{ kJ/mol}$
  - $-1.38 \text{ kJ/mol}$
  - $-13.8 \text{ kJ/mol}$
61. The ratio between the root mean square velocity of  $\text{H}_2$  at 50K and that of  $\text{O}_2$  at 800K is
- 4
  - 2
  - 1
  - $\frac{1}{4}$
62. The time required for completion of 99.9% of a 1<sup>st</sup> order reaction is 25 min. Its  $t_{\frac{1}{2}}$  is
- 20 min
  - 10 min
  - 5 min
  - 2.5 min
63. The amount of chlorine evolved at STP when 2 amperes of current is passed for 30 minutes in an aqueous solution of  $\text{NaCl}$
- 66g
  - 1.32g
  - 33g
  - 99g
64. Freundlich adsorption isotherm gives the dependence of the mass of gas adsorbed

( $x$ ) per unit mass of adsorbent ( $m$ ) and pressure at a given temperature ( $T$ ). The correct relation between  $T_1, T_2, T_3$  in the following



- $T_1 > T_2 > T_3$
  - $T_1 < T_3 < T_2$
  - $T_1 < T_2 < T_3$
  - $T_1 = T_2 = T_3$
65. Edge length of a cube is 400 pm. Then its body diagonal length would be
- 600 pm
  - 566 pm
  - 693 pm
  - 500 pm
66. The polymer
- $$\left[ \text{CH}_2 - \text{C}_6\text{H}_3(\text{OH}) - \text{CH}_2 - \text{C}_6\text{H}_3(\text{OH}) - \text{CH}_2 - \text{C}_6\text{H}_3(\text{OH}) - \text{CH}_2 \right]_n$$
- represents.
- Novolac
  - Dacron
  - Glyptol
  - Nylon-6
67. Eutrophication of water bodies is due to
- Presence of  $\text{F}^-$  in water
  - Presence of  $\text{Pb}^{+2}$  in water
  - Presence of  $\text{PO}_4^{-3}$  in water
  - Presence of  $\text{NO}_3^-$  in water
68. How many bridging oxygen atoms are present in  $\text{P}_4\text{O}_{10}$  ?
- 6
  - 4
  - 2
  - 5
69. The oxide which acts as a reducing, oxidizing, bleaching agent and a Lewis base is
- $\text{SO}_3$
  - $\text{SO}_2$
  - $\text{MnO}_2$
  - $\text{CO}_2$

70. The correct order of increasing bond angles in the following species is
- 1)  $\text{ClO}_2^- < \text{Cl}_2\text{O} < \text{ClO}_2$
  - 2)  $\text{Cl}_2\text{O} < \text{ClO}_2 < \text{ClO}_2^-$
  - 3)  $\text{ClO}_2 < \text{Cl}_2\text{O} < \text{ClO}_2^-$
  - 4)  $\text{Cl}_2\text{O} < \text{ClO}_2^- < \text{ClO}_2$
11.  $\text{XeF}_4$  on complete hydrolysis gives
- 1) Xe
  - 2)  $\text{XeO}_2$
  - 3)  $\text{XeO}_3$
  - 4)  $\text{XeO}_4$
72. A hydrocarbon X adds on one mole of hydrogen to give another hydrocarbon and decolourised bromine water. X reacts with  $\text{KMnO}_4$  in presence of acid to give two mole of the same carboxylic acid. The structure of X is :
- 1)  $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{CH}_3$
  - 2)  $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}_2\text{CH}_3$
  - 3)  $\text{CH}_3\text{CH}_2\text{CH}_2-\text{CH}=\text{CHCH}_3$
  - 4)  $\text{CH}_2=\text{CH}-\text{CH}_2\text{CH}_2\text{CH}_3$
73. Which of the following complex will show geometrical as well as optical isomerism ?
- en= ethylene diamine
- 1)  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$
  - 2)  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_4]$
  - 3)  $[\text{Pt}(\text{en})_3]^{4+}$
  - 4)  $[\text{Pt}(\text{en})_2\text{Cl}_2]$
74. Which one of the following is not an organometallic compound ?
- 1)  $(\text{C}_2\text{H}_5)_2\text{Zn}$
  - 2)  $\text{CH}_3\text{B}(\text{OCH}_3)_2$
  - 3)  $\text{B}(\text{OCH}_3)_3$
  - 4)  $\text{Ni}(\text{CO})_4$
75. Which of the following is least reactive in a nucleophilic substitution reaction ?
- 1)  $(\text{CH}_3)_3\text{C}-\text{Cl}$
  - 2)  $\text{CH}_2=\text{CHCl}$
  - 3)  $\text{CH}_3\text{CH}_2\text{Cl}$
  - 4)  $\text{CH}_2=\text{CHCH}_2\text{Cl}$
76. Oxymercuration –demercuration of 3,3-dimethyl -1 – butene gives
- 1) 3,3 – dimethyl -1- butanol
  - 2) 3,3 – dimethyl -2- butanol
  - 3) 2,3 – dimethyl -2- butanol
  - 4) 2,3 – dimethyl -1- butanol
77. The reaction
- $$\text{C}_6\text{H}_5\text{ONa} + \text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_5\text{OH} + \text{NaHCO}_3$$
- Suggests that
- 1) Phenol is a stronger acid than carbonic acid
  - 2) Carbonic acid a stronger acid than phenol
  - 3) Water is a stronger acid than phenol
  - 4) None of the above
78. Reaction between  $(\text{CH}_3)_2\text{Cd}$  and  $\text{C}_6\text{H}_5\text{COCl}$  leads to the formation of
- 1) Benzophenone
  - 2) Acetophenone
  - 3) Acetone
  - 4) Benzaldehyde
79. In the cannizzaro reaction given below
- $$2\text{Ph}-\text{CHO} \xrightarrow{\text{OH}^-} \text{Ph}-\text{CH}_2\text{OH} + \text{PhCO}_2^-$$
- the slowest step is
- 1) The attack of  $\text{OH}^-$  at the carbonyl group
  - 2) The transfer of hydride ion to the carbonyl group
  - 3) The abstraction of a proton from the carboxylic acid
  - 4) The deprotonation of  $\text{Ph}-\text{CH}_2\text{OH}$

80. Which of the following amines cannot be prepared by Gabriel's synthesis
- 1) Butylamine
  - 2) Isopropylamine
  - 3) 2- Phenylethylamine
  - 4) N-methylbenzylamine
81.  $C_6H_5NO_2 \xrightarrow{Fe/HCl} A \xrightarrow[273K]{NaNO_2+HCl} B \xrightarrow[283K]{H_2O} C$
- 3)  $C_6H_5CHO$
  - 4)  $C_6H_5NH_2$
82. Oxone is name given to :
- 1) Ozone
  - 2) Sodiumperoxide
  - 3) Sodium oxide
  - 4) Sodamide
83. Mixture of  $MgCl_2$  and  $MgO$  is called
- 1) Portland cement
  - 2) Sorel's cement
  - 3) Double salt
  - 4) None of these
84. Name the structure of silicate in which three oxygen atoms of  $[SiO_4]^{4-}$  are shared:
- 1) Pyrosilicate
  - 2) Sheet silicate
  - 3) Linear chain silicate
  - 4) Three dimensional sheet silicate
85. 29.5 mg of an organic compound containing nitrogen was digested according to Kjeldahl's method and the evolved ammonia was absorbed in 20 mL of 0.1 M HCl solution .The excess of the acid required 15 mL of 0.1 M NaOH solution for complete neutralization .The percentage of nitrogen in the compound is
- 1) 29.5
  - 2) 59.0
  - 3) 47.4
  - 4) 23.7
86.  $A^- \rightarrow A^+, \Delta H = +600KJ$  occurs in two steps. If I.P of A is 500 KJ then electron gain enthalpy of A
- 1) + 100 KJ
  - 2) 1100 KJ
  - 3) -100 KJ
  - 4) -1100 KJ
87. The correct Lewis acid order for boron halides is :
- 1)  $C_6H_5OH$
  - 2)  $C_6H_5CH_2OH$
  - 1)  $BF_3 > BCl_3 > BBr_3 > BI_3$
  - 2)  $BCl_3 > BF_3 > BBr_3 > BI_3$
  - 3)  $BI_3 > BBr_3 > BCl_3 > BF_3$
  - 4)  $BBr_3 > BCl_3 > BI_3 > BF_3$
88. Which one of the following has the smallest heat of hydrogenation per mole?
- 1) 1-butene
  - 2) trans -2-butene
  - 3) cis-2- butene
  - 4) 1,3 – butadiene
89. Friedel-Crafts reaction does not occur in case of :
- 1) Toluene
  - 2) Benzene
  - 3) Napthalene
  - 4) Pyridine
90. Which of the following is the most powerful meta directing group ?
- 1)  $-NO_2$
  - 2)  $-SO_3H$
  - 3)  $-CHO$
  - 4)  $-COOH$

## **BIOLOGY :**

91. Given below is the representation of an event at a particular stage of cell division. Identify the stage.



- 1) Anaphase of mitosis
  - 2) Prophase I of meiosis
  - 3) Prophase II of meiosis
  - 4) Prophase of Mitosis
92. A hydrophyte is in contact with water and air only. It has modified roots, stems and leaves, and is commonly called Terror of Bengal. The genus belongs to
- 1) Free floating hydrophyte
  - 2) Rooted submerged hydrophyte
  - 3) Submerged, suspended hydrophyte
  - 4) Amphibious hydrophyte
93. A student observed a plant specimen that has a green, flat thalloid plant body with long narrow structure (horn like) attached to it. The specimen with above character belong to this group
- 1) Algae
  - 2) Bryophyta
  - 3) Pteridophyta
  - 4) Gymnospermae
94. A biomolecule forms the major part of organic component in living cells. It is a heteropolymer and plays both structural and functional roles in the cells. The basic structural units in this molecule are joined by

- 1) Peptide bonds
  - 2) Ester bonds
  - 3) Hydrogen bonds
  - 4) Glycosidic bonds
95. Choose the wrong statement
- 1) Cells swell in hypertonic solutions and shrink in hypotonic solutions
  - 2) Water potential is the kinetic energy of water which helps in the movement of water
  - 3) The absorption of water by seeds and dry wood takes place by a special type of diffusion called imbibition
  - 4) Solute potential of a cell is always negative
96. When one element is involved in opening and closing of stomata, the other helps to maintain the ribosome structure. They are
- 1) Potassium and Calcium
  - 2) Phosphorus and sulphur
  - 3) Potassium and Magnesium
  - 4) Iron and Magnesium
97. Find out the mismatch pair
- 1) C<sub>4</sub> plants Kranz anatomy
  - 2) Primary CO<sub>2</sub> fixation product of C<sub>4</sub> plants OAA
  - 3) Primary CO<sub>2</sub> acceptor of C<sub>3</sub> plants
  - 4) Calvin pathway of C<sub>4</sub> plants occur in
98. Which of these is /are not a property of facilitated transport?
- A. Requires special membrane proteins
  - B. Highly selective
  - C. Uphill transport
  - D. Requires ATP energy
- 1) A and B only
  - 2) C and D only
  - 3) A and C only
  - 4) B and C only

99. One hormone hastens the maturity period in juvenile conifers, a second hormone controls xylem differentiation while the third increases the tolerance of plants to various stresses and they are respectively
- 1) Auxin, Gibberellin and Cytokinin
  - 2) Gibberellin, Auxin and Cytokinin
  - 3) Gibberellin, Auxin and Ethylene
  - 4) Gibberellin, Auxin and ABA
100. The pioneer species in Xerarch and Hydrarch succession are respectively
- 1) Lichens and sedges
  - 2) Lichens and rooted hydrophytes
  - 3) Phytoplanktons and lichens
  - 4) Lichens and phytoplanktons
101. Bioreactors are useful in
- 1) Separation and purification of a product
  - 2) Processing of large volumes of culture
  - 3) Isolation of genetic material
  - 4) Amplification of genes
102. Find the wrongly matched pair
- 1) Har Gobind Khorana - synthesized RNA molecules chemically
  - 2) George Gamow - Triplet code
  - 3) Messelson and Stahl - regulation of gene expression
  - 4) Alec Jeffrey - DNA finger printing
103. The type of placentation seen in *Argemone* and primrose are respectively
- 1) Axile and free-central
  - 2) Parietal and free-central
  - 3) Parietal and free-central
  - 4) Marginal and free-central
104. Advantage of cleistogamy is
- 1) Higher genetic variability
  - 2) More vigorous off springs
  - 3) Increase in heterozygosity
  - 4) No dependence on pollinators
105. India's wheat yielding revolution in the 1960s was possible primarily due to
- 1) Hybrid seeds
  - 2) Increased chlorophyll content
  - 3) Mutations resulting in plant height reduction
  - 4) Quantitative trait mutations
106. An example of gene therapy is
- 1) Production of injectable hepatitis B-vaccine
  - 2) Production of vaccines in food crop like potatoes which can be eaten
  - 3) Introduced of genes for adenosine deaminase in persons suffering from severe combined immuno deficiency (SCID)
  - 4) Production of test tube babies by artificial insemination and implantation of fertilised eggs
107. Three crops that contribute maximum to global food grain production are
- 1) Wheat, rice and maize
  - 2) Wheat, rice and barley
  - 3) Wheat, maize, and sorghum
  - 4) Rice, maize and sorghum
108. During which stage complete oxidation of glucose, greatest number of ATP molecules are formed from ADP?
- 1) Glycolysis
  - 2) Krebs cycle
  - 3) Conversion of pyruvic acid to acetyl CoA
  - 4) Electron transport chain
109. In a given DNA segment ATGACC AGG ACC CCA ACA, the first base gets mutated. The effect of this on coding by this DNA segment will result in
- 1) Complete change in the type as well as sequence of amino acids
  - 2) Change in the first amino acid only
  - 3) No change in the sequence
  - 4) One amino acid less in the protein

110. Lack of independent assortment of two genes A and B in fruit fly *Drosophila* is due to
- 1) Repulsion
  - 2) Recombination
  - 3) Linkage
  - 4) Crossing over
111. Restriction endonuclease, an enzyme used in genetic engineering, is employed for
- 1) Probing exons
  - 2) Cutting double stranded DNA
  - 3) Cutting single stranded DNA
  - 4) Join strands of DNA
112. Intercalary meristem results in
- 1) Secondary growth
  - 2) Primary growth
  - 3) Apical growth
  - 4) Secondary overgrowth
113. The tissue which perpetuates itself by active cell division is
- 1) Permanent tissue
  - 2) Ground tissue
  - 3) Meristematic tissue
  - 4) Vascular tissue
114. Vascular bundles where the phloem is found to be present on both sides of xylem is said to be
- 1) Radial
  - 2) Conjoint
  - 3) Collateral
  - 4) Bicollateral
115. Thorn is modified branch because
- 1) It is hard, straight and pointed
  - 2) It arises from node
  - 3) It arises in the axil of leaf
  - 4) It is a defensive organ
116. Which of the following is modification of leaf?
- 1) Cladode
  - 2) Phyllode
  - 3) Corm
  - 4) Phylloclade
117. One of the following is a dry indehiscent fruit
- 1) Caryopsis
  - 2) Pod
  - 3) Follicle
  - 4) Lomentum
118. The main organelle involved in modification and routing of newly synthesised proteins to their destination is
- 1) Chloroplast
  - 2) Golgi complex
  - 3) Mitochondria
  - 4) Lysosome
119. *E.coli* cells with a mutated Z gene of the operon cannot grow in medium containing only lactose as the source of energy because
- 1) The lac operon is constitutively active in these cells
  - 2) They cannot synthesise functional  $\beta$ -galactosidase
  - 3) In the presence of glucose *E.coli* cells do not utilise lactose
  - 4) They can not transport lactose from the medium into the cell
120. The number of glucose molecules required to produce 38 ATP molecules under anaerobic conditions by a yeast cell is
- 1) 2
  - 2) 4
  - 3) 19
  - 4) 25
121. DNA fragments generated by restriction endonucleases in a chemical reaction can be separated by
- 1) Electrophoresis
  - 2) Chromatography
  - 3) Centrifugation
  - 4) Polymerase chain reaction

122. Which of the following is not a component of Dixon's theory?
- 1) Cohesion and adhesion of water molecules
  - 2) Continuity of water column
  - 3) Transpiration pull
  - 4) Root Pressure in root of tracheary elements
123. The movement of water in Apoplast and symplast occurs respectively through
- 1) Cell wall, Plasmodesmata
  - 2) Plasma membrane, plasmodesmata
  - 3) Cell wall, intercellular spaces
  - 4) Plasmamembrane, cell wall
124. Which one of the following is not a part of a transcription unit in DNA ?
- 1) Structural gene                      2) Inducer
  - 3) Promoter                                4) Terminator
125. Identify the incorrect match.
- 1)  $K^+$  pump hypothesis–Stomatal movements
  - 2) Wet sponge–glass tube experiment–Ascent of Sap
  - 3) Bell jar experiment–Transpiration
  - 4) Thistle funnel experiment–Plasmolysis
126. Unrelated feature of genetically modified crop varieties is
- 1) Resistant to abiotic stress
  - 2) Efficiency of mineral usage
  - 3) Dependence on agro chemicals and pesticides
  - 4) Reduce post harvest losses
127. Pick the incorrect pair
- |                 |  |
|-----------------|--|
| Transgenic crop | Desirable character                          |
| 1) Tobacco      | - Pest resistance by RNAi                    |
| 2) Tomato       | - Resistance to <i>Pseudomonas</i> bacterium |
| 3) Soybean      | - Resistance to virus                        |
| 4) Potato       | -Resistant to <i>Phytophthora</i>            |
128. Incorrect match from the following statements
- 1) Diener - Viruses with ribonucleotides only
  - 2) Lichens-Pollution indicators and pioneers of ecological succession
  - 3) Prions -Viruses with polypeptides only
  - 4) Plantae - Reserve food is glycogen (or) fat
129. In selection of recombinants based on chromogenic substrate, the gene that is insertionally inactivated is
- 1) Amp<sup>r</sup> gene                      2)  $\beta$  gal gene
  - 3) rop gene                                4) ori gene
130. Select the correct matches about biofortified crops
- 1) Mustard – Rich in vitamin C
  - 2) Golden rice – Five times more iron
  - 3) Wheat – Rich in lysine, tryptophan
  - 4) Rice – High protein
131. Microbes are used in
- 1) Primary sewage treatment
  - 2) Secondary sewage treatment
  - 3) Production of bioactive molecules
  - 4) 2 and 3
132. These are three genes a, b, c percentage of crossing over between a and b is 20%, b and c is 28% and a and c is 8%. What is the sequence of genes on chromosome ?
- 1) b, a, c                                2) a, b, c
  - 3) a, c, b                                4) None of the above
133. A column of water within xylem vessels of tall trees does not break under its weight because of
- 1) Tensile strength of water
  - 2) Lignified walls of xylem vessels
  - 3) Positive root pressure
  - 4) Dissolved sugars in water

134. Tobacco plants resistant to a nematode have been developed by the introduction of DNA that produced (in the host cells)

- 1) A toxic protein
- 2) A growth hormone
- 3) An antioxidant
- 4) Sense and antisense RNA

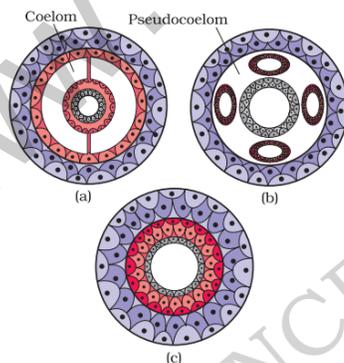
135. Wrongly matched pair among the following is

- 1) *Datura* – Archegonia
- 2) Viroids – RNA
- 3) *Selaginella* – Prothallus
- 4) *Ginkgo* – Haploid endosperm

136. Which one of the following categories of animals, is correctly described with no single exception in it ?

- (1) Mammals -- viviparous and possess diaphragm for breathing
- (2) Reptiles--scales, have a three chambered heart and are cold blooded
- (3) Bony fishes -- four pairs of gills and an operculum on each side
- (4) Sponges -- marine and have collared cells

137. Study the sectional views of different groups and select the correct option from the following (representatives of the related groups)



1.a – *Nereis* ; b – *Taenia* ; c – *Ascaris*

2.a–*Fasciola* ;b–*Wuchereria*;c–*Pheretima*

3.a–*Pheretima*; b–*Ascaris* ;c–*Fasciola*

4.a–*Ancylostoma*;b–*Nereis*;c–*Hirudinaria*

138. Select the correct option with respect to cockroaches

(1)A pair of Spermatheca is present in the 6<sup>th</sup> segment of both male and female cockroaches

(2)Malpighian tubules convert nitrogenous wastes into urea.

(3)the fore wings are tegmina and help in flight.

(4)males bear anal styles and anal cerci while females bear anal cerci but not anal styles

139. Following are the two statements regarding the thermoregulation among the animals.

(a): Very small animals are rarely found in polar regions.

(b): Small animals have a smaller surface area relative to their volume, they tend to lose body heat very fast when it is cold outside.

Which one of the following options is correct?

1.(a) is correct but (b) is false

2.(b) is correct but (a) is false

3.Both (a) and (b) are correct

4.Both (a) and (b) are false.

140. Common cold differs from pneumonia in, that

(1) Pneumonia pathogen infects alveoli where as the common cold affects nose and respiratory passage but not the lungs

(2) Pneumonia is a communicable disease whereas the common cold is a nutritional deficiency disease

(3)Pneumonia could be confirmed by widal test where as the common cold by simple blood test.

(4) Pneumonia is caused by a virus while the common cold is caused by the bacterium *Haemophilus influenza*

141. one correct example each of convergent evolution and divergent evolution ?

Convergent evolution	Divergent evolution
1) thorns of <i>Bougainvillea</i> and tendrils of <i>Cucurbita</i>	Eyes of <i>Octopus</i> and mammals
2) Potato and Sweet Potato	Flippers of Penguins and Dolphins
3) Bones of forelimbs of vertebrates	Wings of butterfly and birds
4) Eyes of <i>Octopus</i> and mammals	Bones of forelimbs of vertebrates

142. A normal-visioned man whose father was colour-blind, marries a woman whose father was also colour-blind. They have their first child as a daughter. What are the chances that this child would be colour-blind ?

- (1) 50%                      (2) 100%  
 (3) Zero percent        (4) 25%

143. Which one of the following animals is correctly matched with its one characteristic and the taxon?

ANIMAL	CHARACTERISTIC	TAXON
1) <i>Planaria</i>	high regeneration capacity	Aschelminthes
2) <i>Exocoetus</i>	Operculum	Osteichthyes
3) <i>Ornithorhynchus</i>	Viviparous	Mammalia
4) <i>Hirudinaria</i>	Parapodia	Annelida

144. Which one of the following conditions correctly describes the manner of determining the sex in the given example?

- (1) The genotype AAXXY produces male in *Drosophila*  
 (2) Homozygous sex chromosomes (ZZ) determine female sex in birds  
 (3) XO type of sex chromosomes determine male sex in grasshopper  
 (4) XXY condition in humans as found in Turner Syndrome, determines female sex

145. The role of Multiload 375 as IUD in females is to

- 1) make uterus unsuitable for implantation.  
 2) prevent ovulation  
 3) make cervix hostile to sperms  
 4) suppress sperm motility

146. Damage to which of the following cells of gastric glands might impact over the absorption of Vitamin B<sub>12</sub> ?

- 1) Parietal cells            2) goblet cells  
 3) Paneth cells            4) peptic cells

147. Given below is an incomplete table about certain hormones, their source glands and one major effect of each on the body in humans. Identify the correct option for the three blanks A, B and C

Glands	Secretion	Effect on the body
I) A	Oestrogen	Secondary sexual characters
II) $\alpha$ - cells of Islets of Langerhans	B	Raises blood glucose levels
III) anterior Pituitary	C	Hypersecretion leads to gigantism

- | A            | B        | C              |
|--------------|----------|----------------|
| (1) Placenta | Glucagon | Calcitonin     |
| (2) Ovary    | Glucagon | Growth hormone |
| (3) Placenta | Insulin  | Vasopressin    |
| (4) Ovary    | Insulin  | Calcitonin     |

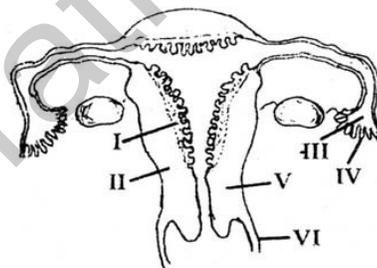
148. Which one of the following pairs is correctly matched while the remaining Three are wrong?

- (1) Amount of Nutrients present in the soil at any given time – Standing Crop.
- (2) The mass of living organism in a unit area – Standing State
- (3) Always upright positioned Pyramid – Pyramid of Energy
- (4) Always inverted positioned Pyramid – Pyramid of Biomass

149. Which one of the following statements is correct with respect to kidney function regulation?

- (1) During summer when body loses lot of water by evaporation, the release of ADH is Suppressed
- (2) When someone drinks lot of water, ADH release is suppressed
- (3) Exposure to cold temperature stimulates ADH release.
- (4) An increase in glomerular blood flow stimulates formation of Angiotensin II

150. The figure given below displays a diagrammatic sectional view of the female reproductive system of humans. Which one set of three parts out of I – VI have been correctly identified?



- (1) (I) Perimetrium, (II) Myometrium, (III) Fallopian tube
- (2) (II) Endometrium, (III) Infundibulum, (IV) Fimbriae
- (3) (III) Infundibulum, (IV) Fimbriae, (V) Cervix
- (4) (IV) Oviducal funnel, (V) Uterus, (VI) Cervix

151. Abundant antibodies present in the colostrums secreted by mother during the initial days of Lactation to protect the infant are

- |          |          |
|----------|----------|
| (1) Ig E | (2) Ig A |
| (3) Ig G | (4) Ig M |

152. Which one of the following is the correct matching of the events occurring during menstrual cycle ?

- (1) Proliferative phase : Rapid regeneration of myometrium and maturation of Graafian follicle.
- (2) Secretory phase : development of corpus luteum and increased secretion of progesterone.
- (3) Menstruation : breakdown of myometrium and ovum which is not fertilised.
- (4) Ovulation : LH and FSH attain low level and sharp rise in the secretion of progesterone.

153. Which one of the following statements is totally wrong about the occurrence of notochord while the other three are correct ?

- (1) It is present throughout life in *Amphioxus*
- (2) It is present only in Larval Tail of *Ascidians*
- (3) It is absent throughout the life in humans from the very beginning
- (4) It is replaced by a vertebral column in Adult Frog

154. Which one of the following statements is true regarding digestion and absorption of food in humans ?

- (1) Fructose and amino acids are absorbed through intestinal mucosa with the help of carrier ions like Na<sup>+</sup>.
- (2) Chylomicrons are small lipoprotein particles that are transported from intestine into blood capillaries.
- (3) About 60% of starch is hydrolysed by salivary amylase in our mouth.
- (4) Oxyntic cells in our stomach secrete the pro enzyme pepsinogen.

155. Foetal ejection reflex in human female is induced by:

- (1) release of oxytocin from pineal
- (2) fully developed foetus and placenta
- (3) differentiation of mammary glands
- (4) pressure exerted by amniotic fluid

156. In a standard ECG given below, which one of the following alphabets is the correct representation of the respective activity of the human heart?



- (1) S – start of systole
- (2) T – end of diastole
- (3) P – depolarisation of the atria
- (4) R – repolarisation of ventricles

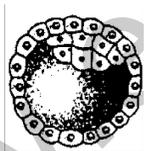
157. The correct sequence of spermatogenic stages leading to the formation of sperms in a mature human testis is:

- (1) spermatogonia – spermatocyte – spermatid – sperms
- (2) spermatid – spermatocyte – spermatogonia – sperms
- (3) spermatogonia – spermatid – spermatocyte – sperms
- (4) spermatocyte – spermatogonia – spermatid – sperms

158. In which one of the following options the two examples are correctly matched with their particular type of immunity?

Type of immunity	Examples
1) Physiological barriers	Mucus coating of epithelium lining the urinogenital tract and the HCl in stomach
2) active immunity	Anti-tetanus and anti – snake bite injections
3) Cellular barriers	Polymorpho-nuclear leucocytes and monocytes
4) Saliva in mouth and Tears in eyes	Physical barriers

159. Identify the human developmental stage shown below as well as the related right place of its occurrence in a normal pregnant woman, and select the right option for the two together.



Developmental stage    Site of occurrence

- (1) 8-celled morula----Starting point of Fallopian tube
- (2) Late morula----anterior part of vagina
- (3) Blastocyst -----Uterine wall
- (4) Blastula----End part of Fallopian tube

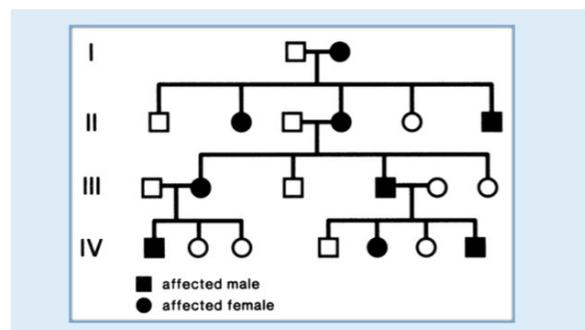
160. The eye of octopus and eye of mammal show different patterns of structure, yet they perform similar function. This is an example of :

- (1) Analogous organs that have evolved due to divergent evolution
- (2) Homologous organs that have evolved due to convergent evolution
- (3) Homologous organs that have evolved due to divergent evolution
- (4) Analogous organs that have evolved due to convergent evolution

161. Which group of animals belong to the same phylum?

- (1) Sea walnut, Sea anemone, Sea hare
- (2) Sea lily, Sea urchin, Sea cucumber
- (3) Earthworm, Pinworm, Tapeworm
- (4) Dog fish, devil fish, saw fish

162. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree

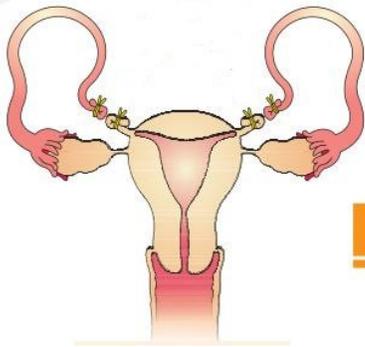


- 1) Holandric character
- 2) Autosomal dominant
- 3) X – linked recessive
- 4) Autosomal recessive

163. Which one of the following describes correctly the homologous characters?

- 1)organs with anatomical dissimilarities but performing same function.
- 2) organs that have no function now, but had an important function in ancestors
- 3) organs with anatomical similarities but performing different functions
- 4) organs appearing only in embryonic stage but disappearing in the adult

164. Study the following diagram and select the suitable condition of it from the following



- 1)Vasectomy
- 2)MTP
- 3)Tubectomy
- 4)insertion of progesterone

165. Which of the following parts of human ear are considered as the specific receptor responsible for maintenance of balance of the body and posture?

- 1)ear ossicles    2)crista and macula
- 3)organ of Corti    4)cochlea

166. Biradial symmetry and lack of cnidoblasts are the characteristics of

- 1)Starfish and *Hydra*
- 2)Sea cucumber and Sea anemone
- 3)*Hormiphora* and *Bero*
- 4)*Aurelia* and *Pennatula*

167. In a population of a random mating present at equilibrium, the frequency of 'A' allele is 0.6 . What would be the frequency of heterozygote in that population?

- 1)0.36                      2)0.16
- 3)0.24                      4)0.48

168. In the developmental history of mammalian heart, it is observed that it passes through a two chambered fish like heart, three chambered frog like heart and finally four chambered stage. To which hypothesis can this above cited above cited statement be approximated?

- 1)Lamarck's principle
- 2)Mendelian principle
- 3)Biogenetic law
- 4)Hardy-Weinberg law

169. Outbreeding is an important strategy of animal husbandry because it

- 1)helps in accumulation of superior genes
- 2)is useful in producing pure lines of animals.
- 3)is useful in overcoming inbreeding depression
- 4)exposes harmful recessive genes that are eliminated by selection

170. An example of ex situ conservation is

- 1)Wild life sanctuary    2)Sacred grove
- 3)Seed bank                      4)National park

171. How do parasympathetic neural signals affect the working of the heart?

- 1)Both heart rate and cardiac output increase
- 2)Heart rate is increased without affecting the cardiac output
- 3)Heart rate decreases but cardiac output increases
- 4) Reduce both heart rate and cardiac output

172. The purplish red pigment rhodopsin contained in the rods type of photoreceptor cells of the human eye, is a derivative of

- 1) Vitamin B<sub>1</sub>    2) Vitamin D  
3) Vitamin A    4) Vitamin C

173. Which hormone of the following regulates the 24 hour(diurnal) rhythm of body like sleep-wake cycle?

- 1) Calcitonin    2) Melatonin  
3) Prolactin    4) Adrenaline

174. Random unidirectional changes in allelic frequencies that occurs by chance in all populations but especially in small populations is considered as

- 1)mutation    2)migration  
3)genetic drift    4)natural selection

175. Three of the following pairs of the human skeletal parts are correctly matched with their respective inclusive skeletal category and one pair is not matched. Identify the non-matching pair

	Pairs of skeletal parts	Category
1)	Sternum and ribs	Axial skeleton
2)	Clavicle and Glenoid cavity	Pelvic girdle
3)	Malleus and stapes	Ear ossicles
4)	Humerus and ulna	Appendicular skeleton

176. In which one of the following the genus name, its two characters and its class/phylum are correctly matched?

Genus name	Two characters	Class/phylum
1) <i>Aurelia</i>	a)colloblasts	Cnidaria
	b)tissue level of organisation	
2) <i>Wuchereria</i>	a)segmented body	Aschelminthes
	b) Males and females distinct	
3) <i>Asterias</i>	a)water canal system	Echinodermata
	b)bilateral symmetrical larva	
4) <i>Salamanca</i>	a)a tympanum represents ear	Amphibia
	b)external fertilisation	

177. The primary dentition in human differs from permanent dentition in not having one of the following type of teeth

1)Molars    2)Premolars  
3)Canines    4)Incisors

178. The UN conference of Parties (COP) on Climate changes in the year 2014 was held at

1)Peru    2)Qatar  
3)South Africa    4)Poland

179. A scrubber in the exhaust of a chemical industrial plant removes

- 1) particulate matter of the size 2.5 micrometer or less
- 2) particulate matter of the size 5 micrometers or above
- 3) gases like ozone and methane
- 4) gases like sulphur dioxide

180. The ciliated columnar epithelial cells in humans are known to occur in

- 1) Fallopian tubes and urethra
- 2) Eustachian tube and stomach lining
- 3) Bronchioles and Fallopian tubes
- 4) Bile duct and oesophagus

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## KEY SHEET

### PHYSICS

1) 3	2) 3	3) 4	4) 3	5) 4	6) 4	7) 4	8) 3	9) 1	10) 2
11) 1	12) 3	13) 2	14) 4	15) 3	16) 3	17) 4	18) 1	19) 4	20) 1
21) 1	22) 1	23) 2	24) 3	25) 3	26) 2	27) 2	28) 1	29) 3	30) 4
31) 3	32) 2	33) 3	34) 4	35) 1	36) 3	37) 2	38) 4	39) 2	40) 1
41) 3	42) 1	43) 3	44) 1	45) 2					

### CHEMISTRY

46) 2	47) 1	48) 3	49) 3	50) 4	51) 4	52) 2	53) 4	54) 4	55) 3
56) 2	57) 2	58) 4	59) 2	60) 2	61) 3	62) 4	63) 2	64) 3	65) 3
66) 1	67) 3	68) 1	69) 2	70) 1	71) 3	72) 2	73) 4	74) 3	75) 2
76) 2	77) 2	78) 2	79) 2	80) 4	81) 1	82) 2	83) 2	84) 2	85) 4
86) 3	87) 3	88) 4	89) 4	90) 1					

### BIOLOGY

91) 2	92) 1	93) 2	94) 1	95) 1	96) 3	97) 3	98) 1	99) 4	100) 4
101) 2	102) 3	103) 3	104) 4	105) 1	106) 3	107) 1	108) 4	109) 2	110) 3
111) 2	112) 2	113) 3	114) 4	115) 3	116) 2	117) 1	118) 2	119) 2	120) 3
121) 1	122) 4	123) 1	124) 2	125) 4	126) 3	127) 3	128) 4	129) 2	130) 1
131) 2	132) 1	133) 2	134) 1	135) 1					

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