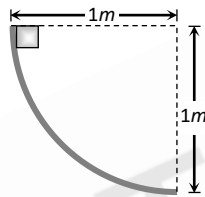
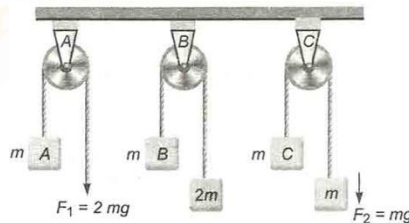


**FULLTEST - 01**  
**PART- A (PHYSICS)**

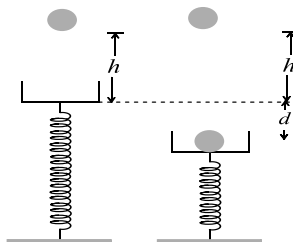
1. Inductance  $L$  can be dimensionally represented as  
 a)  $ML^2T^{-2}A^{-2}$       b)  $ML^2T^{-4}A^{-3}$       c)  $ML^{-2}T^{-2}A^{-2}$       d)  $ML^2T^4A^3$
2. A ball is dropped downwards. After 1 second another ball is dropped downwards from the same point. What is the distance between them after 3 seconds  
 a) 25 m      b) 20 m      c) 50 m      d) 9.8 m
3. A body executing uniform circular motion has at any instant its velocity vector and acceleration vector  
 a) along the same direction      b) in opposite direction  
 c) normal to each other      d) not related to each other
4. A body of mass 2 kg slides down a curved track which is quadrant of a circle of radius 1 metre. All the surfaces are frictionless. If the body starts from rest, its speed at the bottom of the track is



- a) 4.43 m/sec      b) 2 m/sec      c) 0.5 m/sec      d) 19.6 m/sec
5. In figure, the blocks A, B and C each of mass  $m$  have acceleration  $a_1, a_2$  and  $a_3$  respectively.  $F_1$  and  $F_2$  are external forces of magnitude  $2mg$  and  $mg$  respectively. Then



- a)  $a_1 = a_2 = a_3$       b)  $a_1 > a_3 > a_2$       c)  $a_1 = a_2, a_2 = a_3$       d)  $a_1 = a_2, a_1 = a_3$
6. A vertical spring with force constant  $K$  is fixed on a table. A ball of mass  $m$  at a height  $h$  above the free upper end of the spring falls vertically on the spring so that the spring is compressed by a distance  $d$ . The net work done in the process is



- a)  $mg(h + d) + \frac{1}{2}Kd^2$       b)  $mg(h + d) - \frac{1}{2}Kd^2$   
 c)  $mg(h - d) - \frac{1}{2}Kd^2$       d)  $mg(h - d) + \frac{1}{2}Kd^2$

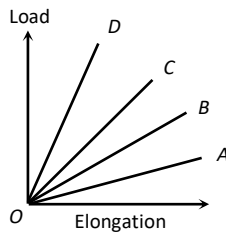
7. A ring starts to roll down the inclined plane of height  $h$  without slipping. The velocity with it reaches the ground is

- a)  $\sqrt{\frac{10gh}{7}}$       b)  $\sqrt{\frac{4gh}{7}}$       c)  $\sqrt{\frac{4gh}{3}}$       d)  $\sqrt{gh}$

8. An asteroid of mass  $m$  is approaching earth, initially at a distance of  $10 R_e$  with speed  $v_i$ . It hits the earth with a speed  $v_f$  ( $R_e$  and  $M_e$  are radius and mass of earth), then

- a)  $v_f^2 = v_i^2 + \frac{2Gm}{M_e R} \left(1 - \frac{1}{10}\right)$       b)  $v_f^2 = v_i^2 + \frac{2GM_e}{R_e} \left(1 + \frac{1}{10}\right)$   
 c)  $v_f^2 = v_i^2 + \frac{2GM_e}{R_e} \left(1 - \frac{1}{10}\right)$       d)  $v_f^2 = v_i^2 + \frac{2Gm}{R_e} \left(1 - \frac{1}{10}\right)$

9. The load versus elongation graph for four wires of the same material is shown in the figure. The thickest wire is represented by the line



- a) OD      b) OC      c) OB      d) OA

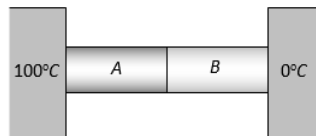
10. The coefficient of viscosity for hot air is

- a) Greater than the coefficient of viscosity of cold air  
 b) Smaller than the coefficient of viscosity for cold air  
 c) Same as the coefficient of viscosity for cold air  
 d) Increases or decrease depending on the external pressure

11. Hot water cools from  $60^\circ\text{C}$  to  $50^\circ\text{C}$  in the first 10 min and to  $42^\circ\text{C}$  in the next 10 min. The temperature of the surroundings is

- a)  $10^\circ\text{C}$       b)  $5^\circ\text{C}$       c)  $15^\circ\text{C}$       d)  $20^\circ\text{C}$

12. Two metal cubes A and B of same size are arranged as shown in the figure. The extreme ends of the combination are maintained at the indicated temperatures. The arrangement is thermally insulated. The coefficients of thermal conductivity of A and B are  $300\text{W}/\text{m}^\circ\text{C}$  and  $200\text{W}/\text{m}^\circ\text{C}$ , respectively. After steady state is reached, the temperature of the interface will be



- a)  $45^\circ\text{C}$       b)  $90^\circ\text{C}$       c)  $30^\circ\text{C}$       d)  $60^\circ\text{C}$

13. The efficiency of a Carnot engine working between 800 K and 500 K is

- a) 0.4      b) 0.625      c) 0.375      d) 0.5

14. For an ideal gas of diatomic molecules

- a)  $C_p = \frac{5}{2}R$       b)  $C_v = \frac{3}{2}R$       c)  $C_p - C_v = 2R$       d)  $C_p = \frac{7}{2}R$

15. For Simple Harmonic Oscillator, how many times the potential energy is equal to kinetic energy during one complete period

- a) 1      b) 2      c) 3      d) 4

16. A pipe open at both ends produces a note of frequency  $f_1$ . When the pipe is kept with  $\frac{3}{4}$ th of its length in water, it produced a note of frequency  $f_2$ . The ratio  $\frac{f_1}{f_2}$  is

- a)  $\frac{3}{4}$       b)  $\frac{4}{3}$       c)  $\frac{1}{2}$       d) 2

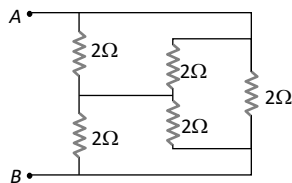
17. A parallel plate capacitor has plate area  $A$  and separation  $d$ . It is charged to a potential difference  $V_0$ . The charging battery is disconnected and the plates are pulled apart to three times the initial separation. The work required to separate the plates is

- a)  $\frac{3\varepsilon_0AV_0^2}{d}$       b)  $\frac{\varepsilon_0AV_0^2}{2d}$       c)  $\frac{\varepsilon_0AV_0^2}{3d}$       d)  $\frac{\varepsilon_0AV_0^2}{d}$

18. A solid metallic sphere has a charge  $+3Q$ . Concentric with this sphere is a conducting spherical shell having charge  $-Q$ . The radius of the sphere is  $a$  and that of the spherical shell is  $b$  ( $b > a$ ). What is the electric field at a distance  $R$  ( $a < R < b$ ) from the centre

- a)  $\frac{Q}{2\pi\varepsilon_0R}$       b)  $\frac{3Q}{2\pi\varepsilon_0R}$       c)  $\frac{3Q}{4\pi\varepsilon_0R^2}$       d)  $\frac{4Q}{4\pi\varepsilon_0R^2}$

19. Find the equivalent resistance across  $AB$

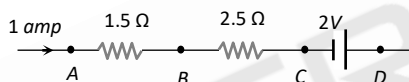


- a)  $1\ \Omega$       b)  $2\ \Omega$       c)  $3\ \Omega$       d)  $4\ \Omega$

20. The ratio of voltage sensitivity ( $V_S$ ) and current sensitivity ( $I_S$ ) of a moving coil galvanometer is

- a)  $\frac{1}{G}$       b)  $\frac{1}{G^2}$       c)  $G$       d)  $G^2$

21. In the circuit element given here, if the potential at point  $B$ ,  $V_B = 0$ , then the potentials of  $A$  and  $D$  are given as



- a)  $V_A = -1.5V, V_D = +2V$       b)  $V_A = +1.5V, V_D = +2V$   
 c)  $V_A = +1.5V, V_D = +0.5V$       d)  $V_A = +1.5V, V_D = -0.5V$

22. The magnetic field induction at a point 4 cm from a long current carrying wire is  $10^{-3}$  T. The magnetic field induction at a distance of 1.0 cm from the same current wire will be

- a)  $2 \times 10^{-4}$  T      b)  $3 \times 10^{-4}$  T      c)  $4 \times 10^{-3}$  T      d)  $1.11 \times 10^{-4}$  T

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

- a) 2      b) 1.5      c) 0.55      d) 0.65

24. At a place the value of horizontal component of the earth's magnetic field  $H$  is  $3 \times 10^{-5}$  weber/ $m^2$ . A metallic rod  $AB$  of length 2 m placed in east-west direction, having the end  $A$  towards east, falls vertically downward with a constant velocity of 50 m/s. Which end of the rod becomes positively charged and what is the value of induced potential difference between the two ends

- a) End A,  $3 \times 10^{-3}$  mV      b) End A, 3 mV      c) End B,  $3 \times 10^{-3}$  mV      d) End B, 3 mV

25. If  $E = 100 \sin(100t)$  volt and  $I = 100 \sin\left(100t + \frac{\pi}{3}\right)$  mA are the instantaneous values of voltage and current, then the r. m. s. values of voltage and current are respectively

- a) 70.7V, 70.7mA      b) 70.7V, 70.7A  
 c) 141.4V, 141.4mA      d) 141.4V, 141.4A

26. In a plane electromagnetic wave propagating in space has an electric field of amplitude  $9 \times 10^3$  Vm $^{-1}$ , then the amplitude of the magnetic field is

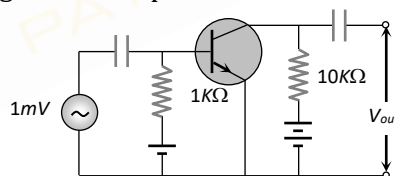
- a)  $2.7 \times 10^{12}$  T      b)  $9.0 \times 10^{-3}$  T      c)  $3.0 \times 10^{-4}$  T      d)  $3.0 \times 10^{-5}$  T

27. A concave lens of glass, refractive index 1.5, has both surfaces of same radius of curvature  $R$ . On immersion in a medium of refractive index 1.75, it will behave as a

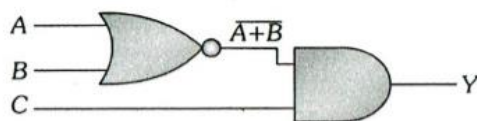
- a) Convergent lens of focal length  $3.5 R$       b) Convergent lens of focal length  $3.0 R$   
 c) Divergent lens of focal length  $3.5 R$       d) Divergent lens of focal length  $3.0 R$
28. The magnifying power of a telescope is  $m$ . If the focal length of the eye-piece is halved, then its magnifying power is  
 a)  $2m$       b)  $\frac{m}{2}$       c)  $\frac{1}{2m}$       d)  $4m$
29. In a Young's double slit experiment,  $I_1/I_2 = 16/9$ . Ratio of maximum to minimum intensity is  
 a) 1 : 49      b) 9 : 16      c) 16 : 9      d) 49 : 1
30. What is the momentum of a photon having frequency  $1.5 \times 10^{13} \text{ Hz}$   
 a)  $3.3 \times 10^{-29} \text{ kgm/s}$       b)  $3.3 \times 10^{-34} \text{ kgm/s}$   
 c)  $6.6 \times 10^{-34} \text{ kgm/s}$       d)  $6.6 \times 10^{-30} \text{ kgm/s}$
31. Two charged spheres of radii  $R_1$  and  $R_2$  having equal surface charge density. The ratio of their potential is  
 a)  $R_1/R_2$       b)  $R_2/R_1$       c)  $(R_1/R_2)^2$       d)  $(R_2/R_1)^2$
32. The first line of Balmer series has wavelength  $6563 \text{ \AA}$ . What will be the wavelength of the first member of Lyman series  
 a)  $1215.4 \text{ \AA}$       b)  $2500 \text{ \AA}$       c)  $7500 \text{ \AA}$       d)  $600 \text{ \AA}$
33. The nucleus  $\text{Ca}_{48}^{115}$  after two successive  $\beta^-$  decays will give  
 a)  $\text{Pa}_{46}^{115}$       b)  $\text{In}_{49}^{114}$       c)  $\text{Sn}_{50}^{113}$       d)  $\text{Sn}_{50}^{115}$
34. In an experiment on photoelectric emission from a metallic surface, wavelength of incident light is  $2 \times 10^{-7} \text{ m}$  and stopping potential is  $2.5 \text{ V}$ . The threshold frequency of the metal (in Hz) approximately (charge on electron  $e = 1.6 \times 10^{-19} \text{ C}$ , Planck's constant  $h = 6.6 \times 10^{-34} \text{ J-s}$ )  
 a)  $12 \times 10^{15}$       b)  $9 \times 10^{15}$       c)  $9 \times 10^{14}$       d)  $12 \times 10^{13}$
35. A  $p$ -type material is electrically .....  
 a) Positive      b) Negative  
 c) Neutral      d) Depends on the concentration of  $p$  impurities

### PART- B (PHYSICS)

36. In the following common emitter configuration an  $NPN$  transistor with current gain  $\beta = 100$  is used. The output voltage of the amplifier will be



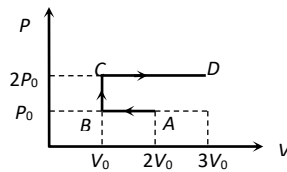
- a)  $10 \text{ mV}$       b)  $0.1 \text{ V}$       c)  $1.0 \text{ V}$       d)  $10 \text{ V}$
37. In the circuit given  $A, B$  and  $C$  are inputs and  $Y$  is the output



The output of  $Y$  is

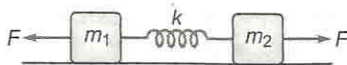
- a) High for all the high inputs      b) High for all the low inputs  
 c) High when  $A = 1, B = 1, C = 0$       d) Low for all low inputs
38. Neeraj Chopra got gold medal in 2021 Olympics in javelin throw by throwing his maximum range  $87.58 \text{ m}$ . what is the maximum height attained by the javelin during this throw.  
 (a)  $14.82 \text{ m}$       (b)  $21.90 \text{ m}$       (c)  $36.42 \text{ m}$       (d)  $43.79 \text{ m}$

39. A spring of spring constant  $5 \times 10^3 \text{ N/m}$  is stretched initially by  $5 \text{ cm}$  from the unstretched position. Then the work required to stretch it further by another  $5 \text{ cm}$  is  
 a)  $6.25 \text{ N-m}$                       b)  $12.50 \text{ N-m}$                       c)  $18.75 \text{ N-m}$                       d)  $25.00 \text{ N-m}$
40. A plate oscillates with time period ' $T$ '. Suddenly, another plate put on the first time, then time period  
 a) Will decrease                      b) Will increase                      c) Will be same                      d) None of these
41. When energy of a satellite earth system is non-zero positive value, then satellite will  
 a) Move around the earth in a circular orbit  
 b) Just escape out  
 c) Move around the earth in an elliptical orbit  
 d) Escape out with speed some interstellar speed
42.  $P$ - $V$  diagram of an ideal gas is as shown in figure. Work done by the gas in process  $ABCD$  is



- a)  $4P_0V_0$                       b)  $2P_0V_0$                       c)  $3P_0V_0$                       d)  $P_0V_0$
43. A proton and an electron are released from rest in uniform electric field, then the correct statement of the following  
 a) Time required to fall through certain distance is more for electron  
 b) Force experienced by the proton is more  
 c) Magnitude of acceleration experienced is more for proton  
 d) KE gained by both charges when moved through the same distance are equal
44.  $n$ th Bright fringe if red light ( $\lambda_1 = 7500 \text{ \AA}$ ) coincides with  $(n + 1)^{th}$  bright fringe of green light ( $\lambda_2 = 6000 \text{ \AA}$ ). The value of  $n = ?$   
 a) 4                      b) 5                      c) 3                      d) 2
45. A charged particle is projected in a plane perpendicular to a uniform magnetic field. The area bounded by the path described by the particle is proportional to  
 a) The velocity                      b) The momentum  
 c) The kinetic energy                      d) None of these
46. The apparent frequency of a note, when a listener moves towards a stationary source, with velocity of  $40 \text{ m/s}$  is  $200 \text{ Hz}$ . When the moves away from the same source with the same speed, the apparent frequency of the same note is  $160 \text{ Hz}$ . The velocity of sound in air is (in  $\text{m/s}$ )  
 a) 360                      b) 330                      c) 320                      d) 340
47. In a region of uniform magnetic induction  $B = 10^{-2} \text{ tesla}$ , a circular coil of radius  $30 \text{ cm}$  and resistance  $\pi^2 \text{ ohm}$  is rotated about an axis which is perpendicular to the direction of  $B$  and which forms a diameter of the coil. If the rotates at  $200 \text{ rpm}$  the amplitude of the alternating current induced in the coil is  
 a)  $4\pi^2 \text{ mA}$                       b)  $30 \text{ mA}$                       c)  $6 \text{ mA}$                       d)  $200 \text{ mA}$
48. When monochromatic radiation of intensity  $I$  falls on a metal surface, the number of photoelectron and their maximum kinetic energy are  $N$  and  $T$  respectively. If the intensity of radiation is  $2I$ , the number of emitted electrons and their maximum kinetic energy are respectively  
 a)  $N$  and  $2T$                       b)  $2N$  and  $T$                       c)  $2N$  and  $2T$                       d)  $N$  and  $T$

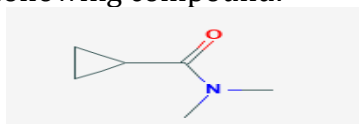
49. A block of mass  $0.1 \text{ kg}$  is held against a wall by applying a horizontal force of  $5 \text{ N}$  on the block. If the coefficient of friction between the block and the wall is  $0.5$ , the magnitude of the frictional force acting on the block is
- a)  $2.5 \text{ N}$       b)  $0.98 \text{ N}$       c)  $4.9 \text{ N}$       d)  $0.49 \text{ N}$
50. In the given figure, two bodies of mass  $m_1$  and  $m_2$  are connected by massless spring of force constant  $k$  and are placed on a smooth surface (shown in figure), then



- a) The acceleration of centre of mass must be zero at every instant  
 b) The acceleration of centre of mass may be zero at every instant  
 c) The system always remains in rest  
 d) None of the above

### PART- A (CHEMISTRY)

51. The number of antibonding electron pairs in  $\text{O}_2^{2-}$  molecular ion on the basis of molecular orbital theory are (at. no.  $\text{O} = 8$ )  
 (a) 2      (b) 3      (c) 4      (d) 5
52. For a chemical reaction  $\text{A} \rightarrow \text{B}$ , it is found that the rate of reaction doubled when the concentration of A is increased four times. The order in A for this reaction is  
 (a) two      (b) one      (c) Half      (d) Zero
53. Given vander waals constants for  $\text{NH}_3$ ,  $\text{H}_2\text{O}_2$  and  $\text{CO}_2$  are respectively  $4.17$ ,  $0.244$ ,  $1.36$  and  $3.59$ , which one of the following gases is most easily liquified ?  
 (a)  $\text{NH}_3$       (b)  $\text{H}_2$       (c)  $\text{CO}_2$       (d)  $\text{O}_2$
54. A compound of a metal ion  $\text{M}^{x+}$  ( $Z = 24$ ) has a spin only magnetic moment of  $\sqrt{15}$  Bohr Magnetons. The number of unpaired electrons in the compound are  
 (a) 2      (b) 4      (c) 5      (d) 3
55. In the balanced chemical reaction  
 $\text{IO}_3^- + a\text{I}^- + b\text{H}^+ \rightarrow c\text{H}_2\text{O} + d\text{I}_2$   
 a, b, c and d respectively corresponds to  
 (a) 5, 6, 3, 3      (b) 5, 3, 6, 3      (c) 3, 5, 3, 6      (d) 5, 6, 5, 5
56. The degree of dissociation of dinitrogen tetroxide  $\text{N}_2\text{O}_4(\text{g}) \rightarrow 2\text{NO}_2(\text{g})$  at temperature T and total pressure P is  $\alpha$ . Which one of the following is the correct expression for the equilibrium constant ( $K_p$ ) at this temperature and pressure ?  
 (a)  $2\alpha/(1-\alpha^2)$       (b)  $\alpha^2P/1-\alpha$       (c)  $4\alpha^2/(1-\alpha^2)$       (d)  $4\alpha^2P/(1-\alpha^2)$
57. During the process of digestion, the proteins present in food materials are hydrolysed to amino acids. The two enzymes involved in the process  
 $\text{Proteins} \xrightarrow{\text{Enzyme(A)}} \text{Polypeptides} \xrightarrow{\text{Enzyme(B)}} \text{Amino acids}$   
 are respectively:  
 (a) amylase and maltase      (b) diastase and lipase  
 (c) pepsin and trypsin      (d) invertase and zymase
58. Electromagnetic separation is used in the concentration of  
 (a) Copper pyrites      (b) Bauxite      (c) Cassiterite      (d) Cinnabar
59. IUPAC name of the following compound:



- (a) N,N-dimethylcyclopropanecarboxamide      (b) N-methylcyclopropanamide  
 (c) cyclopropionamide      (d) none of the above



60. A is lighter phenol and B is an aromatic carboxylic acid. Separation of a mixture of A and B can be carried out easily by using a solution of

- (a) Sodium hydroxide (b) Sodium sulphate  
(c) calcium chloride (d) Sodium bicarbonate

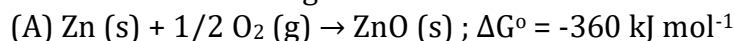
61. 1 M NaCl and 1 M HCl are present in an aqueous solution. The solution is

- (a) not a buffer solution with  $\text{pH} < 7$  (b) not a buffer solution with  $\text{pH} > 7$   
(c) a buffer solution with  $\text{pH} < 7$  (d) a buffer solution with  $\text{pH} > 7$

62. According to the adsorption theory of catalysis, the speed of the reaction increases because

- (a) in the process of adsorption, the activation energy of the molecules becomes large  
(b) adsorption produces heat which increases the speed of the reaction  
(c) adsorption lowers the activation energy of the reaction  
(d) the concentration of product molecules at the active centres of the catalyst becomes higher due to adsorption

63. Consider the following reaction at  $1000^\circ\text{C}$



Choose the correct statement at  $1000^\circ\text{C}$

- (a) Zinc can be oxidised by CO  
(b) Zinc oxide can be reduced by C  
(c) both statement (a) and (b) are true  
(d) Both statements (a) and (b) are false

64. Consider the following complex  $[\text{Co}(\text{NH}_3)_5\text{CO}_3]\text{ClO}_4$ . The coordination number, oxidation number, number of  $d$ -electrons and number of unpaired  $d$ -electrons on the metal are respectively

- (a) 6, 3, 6, 0 (b) 7, 2, 7, 1 (c) 7, 1, 6, 4 (d) 6, 2, 7, 3

65. Match List I (Reaction) with List II (Reagent) and select the correct answer using the codes given below the lists:

**List I**

- I. Etard reaction  
II. Hydroxylation  
III. Dehydrohalogenation  
IV. Friedal-Crafts reaction

**List II**

- A. Alcoholic KOH  
B. Anhydrous  $\text{AlCl}_3$   
C. Chromyl chloride  
D. Dilute alkaline  $\text{KMnO}_4$

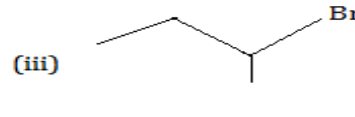
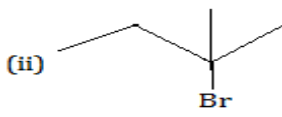
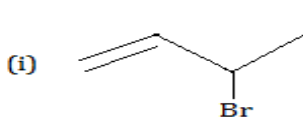
**Codes :**

- (a) I-A, II-D, III-C, IV-B (b) I-D, II-C, III-A, IV-B  
(c) I-C, II-D, III-A, IV-B (d) I-B, II-A, III-D, IV-C

66. The solubility product of  $\text{AgI}$  at  $25^\circ\text{C}$  is  $1.0 \times 10^{-16} \text{ mol}^2 \text{ L}^{-2}$ . The solubility of  $\text{AgI}$  in  $10^{-4} \text{ N}$  solution of  $\text{KI}$  at  $25^\circ\text{C}$  is approximately (in  $\text{mol L}^{-1}$ )

- (a)  $1.0 \times 10^{-12}$  (b)  $1.0 \times 10^{-10}$  (c)  $1.0 \times 10^{-8}$  (d)  $1.0 \times 10^{-16}$

67. Arrange the following alkyl halides according to the decreasing order of rate of hydrolysis :

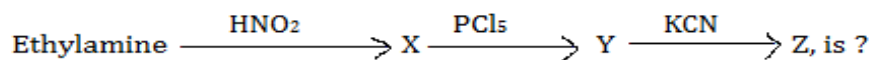


- (a)  $\text{ii} > \text{i} > \text{iii}$  (b)  $\text{i} > \text{ii} > \text{iii}$  (c)  $\text{iii} > \text{ii} > \text{i}$  (d)  $\text{iii} > \text{i} > \text{ii}$

68. Which one of the following is the correct statements?

- (a)  $\text{B}_3\text{N}_3\text{H}_6$  is known as 'inorganic benzene'  
(b) Boric acid is a protonic acid  
(c) Beryllium exhibits coordination number of six  
(d) Chlorides of both beryllium and aluminium have bridged chloride structures in gas phase

69. Number of isomeric alcohols of molecular formula  $C_6H_{14}O$  which give iodoform test is  
 (a) two (b) three (c) four (d) five
70. Teflon, styrene and neoprene are all  
 (a) Copolymers (b) Condensation polymers (c) Homopolymers (d) Monomers
71. For reaction  $PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$ , the value of  $K_c$  at  $250^\circ C$  is  $26 \text{ mol}^{-1} \text{ litre}^{-1}$ . The value of  $K_p$  at this temperature will be  
 (a)  $0.61 \text{ atm}^{-1}$  (b)  $0.57 \text{ atm}^{-1}$  (c)  $0.83 \text{ atm}^{-1}$  (d)  $0.46 \text{ atm}^{-1}$
72. Which of the following will give aldol condensation in the presence of aqueous KOH?  
 (a) Formaldehyde (b) Benzaldehyde (c) Acetaldehyde (d) All the above
73. The reducing power of divalent species decreases in the order  
 (a)  $Ge > Sn > Pb$  (b)  $Sn > Ge > Pb$  (c)  $Pb > Sn > Ge$  (d) None
74. When potassium ferrocyanide crystals are heated with conc.  $H_2SO_4$  the gas evolved is  
 (a)  $SO_2$  (b)  $NH_3$  (c)  $CO_2$  (d) CO
75. The end product Z of the reaction :



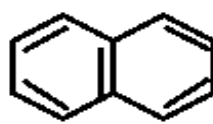
- (a) Propanenitrile (b) Triethylamine (c) Diethylamine (d) Propylamine
76. Which one of the following conditions will favour maximum formation of the product in the reaction,  $A_2(g) + B_2 \rightleftharpoons X_2(g)$ ,  $\Delta_r H = -X \text{ kJ}$ ?  
 (a) low temperature and high pressure (b) low temperature and low pressure  
 (c) High temperature and high pressure (d) High temperature and low pressure
77. The Osmotic pressure of equimolar solutions of  $BaCl_2$ ,  $NaCl$  and glucose will be in the order :  
 (a) glucose  $>$   $NaCl$   $>$   $BaCl_2$  (b)  $BaCl_2$   $>$   $NaCl$   $>$  glucose  
 (c)  $NaCl$   $>$   $BaCl_2$   $>$  glucose (d)  $NaCl$   $>$  glucose  $>$   $BaCl_2$
78. Prevention of corrosion of iron by Zn coating is called  
 (a) Galvanization (b) Cathodic protection  
 (c) Electrolysis (d) Photoelectrolysis
79. What is the total number of compounds, stereoisomers included, designated by the general name "dichlorocyclopentane" ?  
 (a) 6 (b) 7 (c) 8 (d) 9
80. RNA is different from DNA because RNA contains  
 (a) ribose sugar and thymine (b) ribose sugar and uracil  
 (c) deoxyribose sugar and thymine (d) deoxyribose sugar and uracil
81. Which of the following chemical system is non-aromatic ?



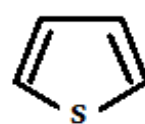
(a)



(b)



(c)

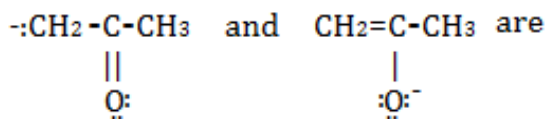


(d)

82.  $AB$ ,  $A_2$  and  $B_2$  are diatomic molecules. If the bond enthalpies of  $A_2$ ,  $AB$  and  $B_2$  are in the ratio  $1 : 1 : 0.5$  and enthalpy of formation of  $AB$  from  $A_2$  and  $B_2$  is  $-100 \text{ kJ mol}^{-1}$ . What is the bond energy of  $A_2$  :  
 (a)  $200 \text{ kJ mol}^{-1}$  (b)  $100 \text{ kJ mol}^{-1}$  (c)  $300 \text{ kJ mol}^{-1}$  (d)  $400 \text{ kJ mol}^{-1}$
83. Beryllium shows diagonal relationship with aluminium. Which of the following similarity is incorrect :  
 (a) Be forms beryllates and Al forms aluminates  
 (b)  $Be(OH)_2$  like  $Al(OH)_3$  is basic  
 (c) Be like Al is rendered passive by  $HNO_3$   
 (d)  $Be_2C$  like  $Al_4C_3$  yields methane on hydrolysis



84.



- (a) Resonating structure (b) Tautomers  
(c) Geometrical isomers (d) Optical isomers

85. The fatty acid which shows reducing property is

- (a)  $\text{CH}_3\text{COOH}$  (b)  $\text{CH}_3\text{CH}_2\text{COOH}$  (c)  $(\text{COOH})_2$  (d)  $\text{HCOOH}$

### PART- B (CHEMISTRY)

86. If the nitrogen atom had electronic configuration  $1s^7$  it would have energy lower than that of the normal ground state configuration  $1s^2 2s^2 2p^3$  because the electrons would be closer to the nucleus. Yet  $1s^7$  is not observed. It violates

- (a) Heisenberg's uncertainty principle (b) Hund's rule  
(c) Pauli's exclusion principle (d) Bohr postulate of stationary orbits

87. For orthorhombic system axial ratios are  $a \neq b \neq c$  and the axial angles are

- (a)  $\alpha = \beta = \gamma \neq 90^\circ$  (b)  $\alpha = \beta = \gamma = 90^\circ$  (c)  $\alpha = \gamma = 90^\circ, \beta \neq 90^\circ$  (d)  $\alpha \neq \beta \neq \gamma = 90^\circ$

88. When cyclohexane is poured on water, it floats because

- (a) cyclohexane is in boat form (b) cyclohexane is in chair form  
(c) cyclohexane is in crown form (d) cyclohexane is less dense than water

89.  $(n-1)d^{10} ns^2$  is the general electronic configuration of

- (a) Fe, Co, Ni (b) Cu, Ag, Au (c) Zn, Cd, Hg (d) Se, Y, La

90. Which is colourless in water ?

- (a)  $\text{Ti}^{3+}$  (b)  $\text{V}^{3+}$  (c)  $\text{Cu}^{3+}$  (d)  $\text{Sc}^{3+}$

91. Structurally biodegradable detergent should contain

- (a) normal alkyl chain (b) branched alkyl chain  
(c) phenyl side chain (d) cyclohexyl side chain

92. Which of the following crystals does not exhibit Frenkel defect ?

- (a)  $\text{AgBr}$  (b)  $\text{AgCl}$  (c)  $\text{KBr}$  (d)  $\text{ZnS}$

93. A reaction which is of first order w.r.t reactant A, has a rate constant  $6 \text{ min}^{-1}$ . If we start with  $[\text{A}] = 0.5 \text{ mol L}^{-1}$ , when would  $[\text{A}]$  reach the value of  $0.05 \text{ mol L}^{-1}$ 

- (a) 0.384 min (b) 0.15 min (c) 3 min (d) 3.84 min

94. The correct order of radii is

- (a)  $\text{N} < \text{Be} < \text{B}$  (b)  $\text{F}^- < \text{O}^{2-} < \text{N}^{3-}$  (c)  $\text{N} < \text{Li} < \text{K}$  (d)  $\text{Fe}^{3+} < \text{Fe}^{2+} < \text{Fe}^{4+}$

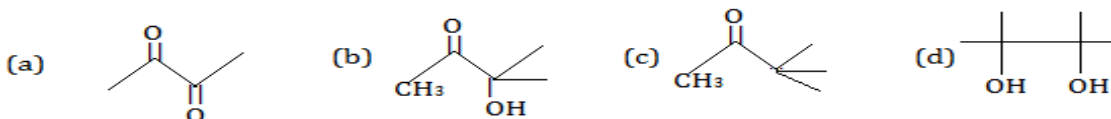
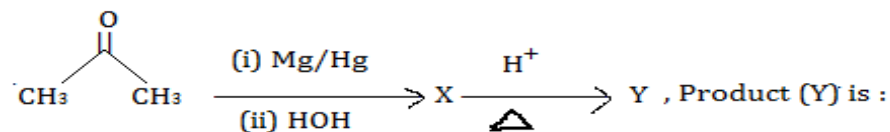
95. In Zeigler-Natta polymerization of ethylene, the active species is

- (a)  $\text{AlCl}_3$  (b)  $\text{Et}_3\text{Al}$  (c)  $\text{CH}_2\text{CH}_2$  (d)  $\text{Ti}^{\text{III}}$

96. An aqueous solution of sucrose,  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ , containing 34.2 g has an osmotic pressure of 2.38 atmospheres at  $17^\circ\text{C}$ . For an aqueous solution of glucose,  $\text{C}_6\text{H}_{12}\text{O}_6$  to be isotonic with this solution, it would have

- (a) 34.2 g/lit (b) 17.1 g/lit (c) 18.0 g/lit (d) 36.0 g/lit of glucose

97.



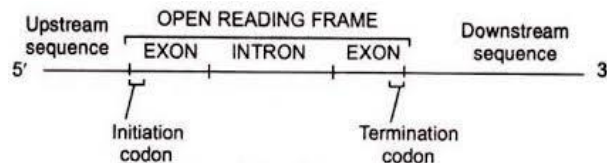
98. The reactivity of iron, magnesium, sodium and zinc towards water are in order as :  
 (a) Fe > Mg > Na > Zn (b) Zn > Na > Mg > Fe  
 (c) Na > Mg > Zn > Fe (d) Mg > Na > Fe > Zn
99. The ortho/para directing group among the following is :  
 (a) COOH (b) CN (c) COCH<sub>3</sub> (d) NHCONH<sub>2</sub>
100. The basicity of aniline is less than that of cyclohexylamine. This is due to  
 (a) +R effect of -NH<sub>2</sub> group (b) -I effect of -NH<sub>2</sub> group  
 (c) -R effect of -NH<sub>2</sub> group (d) hyperconjugation effect

### PART -A (BOTANY)

101. If the gamete has 7 chromosomes in a sexually reproducing diploid organism, then which one is wrong?  
 (A) Anaphase I -14 chromosomes, 28 DNA molecules  
 (B) Metaphase I - 7 bivalents, 28 DNA molecules  
 (C) Anaphase II -14 duplicated chromosomes, 14 DNA molecules  
 (D) Metaphase II- 14 duplicated chromosomes, 28 DNA molecules  
 (a) B&C (b) A&D (c) C&D (d) B&D
102. With reference to absorption of minerals, the term 'outer space' represents----- while 'inner space represents'-----respectively  
 (a) Intercellular space and cell wall; Cytoplasm and vacuole  
 (b) Cytoplasm and vacuole; Intercellular space and cell wall  
 (c) Intracellular space; Vacuole  
 (d) Cytoplasm ; vacuole
103. Which one among the following statements is not correct regarding monocot root?  
 (a) Pericycle gives rise to lateral roots only  
 (b) Passage cells generally occur in endodermis opposite the protoxylem point  
 (c) Endodermis is less thickened and contains prominent Casparian strips  
 (d) Cortex is very wide
104. The secondary growth in dicot stem comprises of  
 I. The vascular cambial ring which is completed by both the primary (intra-fascicular) strip and secondary (interfascicular) strip.  
 II. The vascular rays are narrow since beginning.  
 III. Annual rings or growth rings are absent.  
 IV. Cortex gives birth to cork cambium.  
 Choose the correct option.  
 (a) I and II (b) II and III (c) I, II and IV (d) I, II and III
105. In a living cell, various biomolecules are found indifferent compositions, the average composition of proteins is  
 (a) 70-90% (b) 10-15% (c) 20-25% (d) 50-60%
106. Which of the following does not take place during prophase-I of meiosis?  
 (a) Terminalization (b) Chiasma formation  
 (c) Disjunction (d) Synapsis
107. Identify the correctly matched pair.  
 (a) Apoplast pathway— Water moves exclusively through the cell wall and intercellular space.  
 (b) Transmembrane pathway— Water crosses at least one membrane  
 (c) Symplast pathway— Water moves from one cell to the next via plasmodesmata  
 (d) All of the above
108. Which combination of light is most effective for photosynthesis?  
 (a) Blue and green (b) Yellow and green  
 (c) Green and red (d) Blue and red

109. Which element helps in the activation of enzymes of both photosynthesis and respiration?  
 (a) Calcium (b) Magnesium (c) Phosphorus (d) Potassium
110. Anti-transpirants are the chemicals which reduce the transpiration in plants. Which hormone from the given below is known as the anti-transpirant?  
 (a) Ethylene (b) Abscisic acid (c) Gibberellin (d) Auxin
111. Guttation occurs during night or early morning when there is  
 (a) high atmospheric humidity and transpiration is less  
 (b) low atmospheric humidity and transpiration is more  
 (c) low atmospheric humidity and transpiration is less  
 (d) high atmospheric humidity and transpiration is more
112. In angiosperms, functional megaspore develops as a result of free nuclear division into  
 (a) embryo sac (b) ovule (c) endosperm (d) zygote
113. Which class of fungi lacks sex organs but the process of plasmogamy is brought about by fusion of two vegetative or somatic cells of different strains or genotypes?  
 (a) Sac fungi (b) Bracket fungi (c) Imperfect fungi (d) Phycomycetes
114. In the process of separation of DNA on gel electrophoresis, where would you find the smallest segment of DNA?  
 (a) Near the positive electrode, farthest away from the wells  
 (b) Near the negative electrode, close to the wells  
 (c) Near the top, near the negative pole  
 (d) Near the middle, they tend to slow down, after the first few minutes
115. Organisms which obtain energy by the oxidation of reduced inorganic compounds are called  
 (a) Photoautotrophs (b) Chemoautotrophs (c) Saprozoic (d) Copro-heterotrophs
116. What is the % of functional megaspores formed in monosporic type of embryo sac?  
 (a) 50% (b) 25% (c) 75% (d) 100%
117. Which one of the following statements is false with respect to the condition phenylketonuria?  
 (a) It is the result of pleiotropy (b) It is an autosomal recessive trait  
 (c) It is a metabolic error (d) It is a case of aneuploidy
118. Galactans and mannans are present in/as  
 (a) Reserved food in algae (b) Algal cell wall  
 (c) Reserve food in bacteria (d) Bacterial cell wall
119. What happens when Gram positive bacteria are treated with lysozyme?  
 (a) Their plasma membrane gets dissolved (b) Their genetic material gets dissolved  
 (c) Their cell wall gets dissolved (d) Cell can not survive in high glucose concentration
120. A couple have a haemophilic son, a normal son and a haemophilic daughter. What are the most likely genotypes of the parents in this case?
- |     | <b>Mother's genotype</b>      | <b>Father's genotype</b>      |
|-----|-------------------------------|-------------------------------|
| (a) | X <sup>h</sup> X              | X <sup>h</sup> Y              |
| (b) | XX                            | XY                            |
| (c) | X <sup>h</sup> X <sup>h</sup> | X <sup>h</sup> Y <sup>h</sup> |
| (d) | X <sup>h</sup> Y              | X <sup>h</sup> Y              |
121. What are pyrenoids associated with?  
 (a) Starch storage (b) Photosynthesis  
 (c) Fatty acid oxidation (d) Enzyme secretion
122. Select the correct option for where in nature do the restriction enzymes occur and what is their role?

- (a) In bacteria – defense against viral invasion  
 (b) In yeast – defense against foreign DNA invasion  
 (c) In virus – splicing host cell's DNA  
 (d) In bacteriophage – defense against mutation
123. Read the following statements w.r.t. apomixis and identify the incorrect statement.  
 (a) It refers to asexual mode of reproduction  
 (b) Apomixis is helpful in maintaining genetic purity of mother plant  
 (c) It results in genetic variability  
 (d) It mimics sexual reproduction
124. Given below is the representation of the region of DNA encoding for  $\beta$ - chain haemoglobin.



- Which statement with respect to transcription and translation of exons and introns is correct?
- (a) Both exons and introns are transcribed, but only exons are translated  
 (b) Both are transcribed, but only introns are translated  
 (c) Exons are transcribed and translated  
 (d) Introns are transcribed and translated
125. A dihybrid plant with genotype PpNn. It produces four types of gametes in following number PN = 200, pn = 200, Pn = 800, pN = 800 then what is the distance between linked genes?  
 (a) 30 cM (b) 10 cM (c) 25 cM (d) 20 cM
126. A functional unit of gene which is specific for the synthesis of one polypeptide is known as  
 (a) recon (b) clone (c) codon (d) cistron
127. Arachidonic acid has a carboxyl group attached to an R group. This R group contain:-  
 (a) 16 carbons (b) 15 carbons (c) 20 carbons (d) 19 carbons
128. Prosthetic groups are organic compounds and are tightly bound to the apoenzyme. Haem is the prosthetic group of :-  
 (a) Peroxidase (b) Catalase (c) Carboxypeptidase (d) (a) & (b) both
129. If mother has blood group AB, father has Group A: then which of the following blood group not found in offspring?  
 (a) A (b) B (c) AB (d) O
130. The phyllotaxy of sporophylls in 'Lax' of gymnosperms is:  
 (a) Whorled (b) Spiral  
 (c) Opposite superimposed (d) Opposite decussate
131. The number of cart wheel shaped structures present in anaphase of eukaryotic animal cell is:  
 (a) 2 (b) 8 (c) 4 (d) 6
132. The constitutive/ house keeping gene which always express in Lac operon is:  
 (a) p- gene (b) z- gene (c) i- gene (d) y-gene
133. E.coli containing  $^{15}\text{N}$  DNA is allowed to replicate in  $^{14}\text{N}$  containing medium for two generations. The percentage of DNA with both strands  $^{15}\text{N}$  is:  
 (a) 25% (b) 0% (c) 100% (d) 50%
134. Syncytium formation occurs if:  
 (a) Karyokinesis is not followed by cytokinesis  
 (b) Cytokinesis is not followed by Karyokinesis

- (c) No karyokinesis takes place  
 (d) Both karyokinesis and cytokinesis are prevented
135. Cell division is synonymous with reproduction in  
 (a) Plants and fungi (b) Animal and plant  
 (c) Protista and Monera (d) Monera and algae

### PART -B (BOTANY)

136. Which one of the following is incorrect?  
 (A) Parthenium or carrot grass causes pollen allergy.  
 (B) Vegetative cell of pollen has abundant food reserve.  
 (C) All pollen's cause severe allergies and bronchial afflictions.  
 (D) Sporopollenin is the most resistant organic matter known.  
 (a) All are correct (b) A (c) B (d) C
137. Match the Column-I (Causative agent) with Column-II (Disease).

#### Column-I

1. Virus
2. Bacteria
3. Fungi

#### Column-II

- A. Brown rust of wheat
- B. Red rot of sugar cane
- C. Late blight of potato
- D. Black rot of crucifer
- E. Tobacco mosaic
- F. Turnip mosaic

- (a) 1-E, F ; 2-D; 3-A, B, C (b) 1-E; 2-D, F; 3-A, B, C  
 (c) 1-A, B, C; 2-D, E; 3-F (d) 1-A, B; 2-C, D; 3-E, F

138. Which is not a step in breeding a new genetic variety of crop?

- (a) Collection of variability
- (b) Evaluation and selection of parent
- (c) Self-pollination among the selected parents
- (d) Selection and testing of superior recombinants

139. The extraction of DNA from a gel piece is known as

- (a) Spooling (b) Elution (c) PAGE (d) Annealing

140. Family Fabaceae is concerned with

- (a) Diadelphous stamen, marginal placentation, obliquely placed ovary and vexillary corolla
- (b) Diadelphous stamen, marginal placenta and large posterior petal
- (c) Basal placentation, versatile stamens, spikelet inflorescence
- (d) Axile placentation, non-endospermic seed, legume fruit

141. Protein encoded gene cryIAb controls

- (a) Cotton bollworm (b) Beetles (c) Corn borer (d) Flies

142. Minerals associated with redox reactions are

- (a) N, Cu (b) Fe, Cu (c) Fe, K (d) Mn, Mo

143. Ubiquinone receives reducing equivalents from

- (a) NAD<sup>+</sup> (b) FADH<sub>2</sub> (c) NADH + H<sup>+</sup> (d) Both (b) & (c)

144. How many plants in the list given below have marginal placentation ?

Mustard, Gram, Tulip, Asparagus, Arhar, Sun hemp, Chilli, Colchicine, Onion, Moong, Pea, Tobacco, Lupin

- (a) Four (b) Five (c) Six (d) Three

145. The most abundant protein of biological world is located in

- (a) Cell wall of plants (b) Fluid stroma of chloroplast  
 (c) Cartilage, bone, ligament (d) Plasma membrane

146. All these biomolecules possess nitrogen except

- (a) Lecithin (b) Cholesterol (c) Adenine (d) Alanine



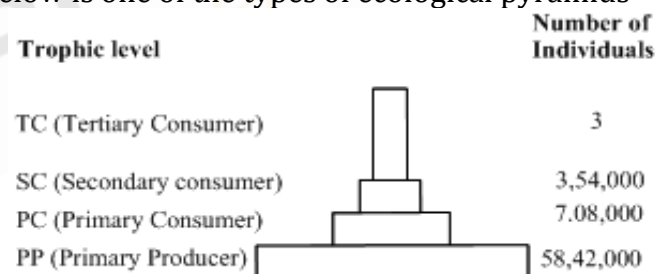
147. A farmer wished to produce bananas that were longer and sweeter. He opted for grafting method to achieve this. What are the chances of his success to achieve this target?  
 (a) 50% (b) 100% (c) 25% (d) Negligible
148. Which of the following have dsDNA as genetic material?  
 (a) TMV (b)  $\phi$ x174 (c) most plant viruses (d) Bacteriophage
149. Blood group of David is O and that of his newly married wife is AB. Their children could have only blood group  
 (a) O,AB (b) A,B (c) O,A,AB (d) A,B,AB
150. The height of a plant is controlled by three genes. The maximum height in the species is 24 inches, whereas the minimum height in the species is 6 inches. What would be the height of a plant of the same species whose genotype is AaBBcc?  
 (a) 12 inches (b) 15 inches (c) 18 inches (d) 21 inches

### PART- A (ZOOLOGY)

151. Factors favorable for the formation of oxyhaemoglobin are \_\_\_\_\_  
 a) Low  $pO_2$  and high  $pCO_2$  b) less  $H^+$  concentration and low temperature  
 c) Low  $pO_2$  and low temperature d) low  $pO_2$  and high  $pCO_2$
152. If mother is Rh<sup>-ve</sup> and father is Rh<sup>+ve</sup>, condition of erythroblastosis foetalis may occur, this condition may be avoided by administering anti-Rh antibodies to  
 a) Foetus, just after the birth b) mother, just after the birth  
 c) mother, just before the birth d) Both foetus and mother, just after the birth
153. Acromion process is found in \_\_\_\_\_  
 a) humerus b) tibia c) Radius d) Scapula
154. Which of the following is incorrect about counter current mechanism?  
 a) Flow of blood in two limbs of vasa recta is in opposite direction  
 b) Flow of filtrate in two limbs of vasa recta is in opposite direction  
 c) NaCl is transported by ascending limb of Henle's loop which is exchanged with the descending limbs of vasa recta  
 d) NaCl is returned to interstitium by the ascending portion of vasa recta
155. Which of the following statements is/are **incorrect**?  
 i) The space between cornea and lens is filled with watery fluid  
 ii) Rhodopsin is red protein, hence called visual red  
 iii) The anterior transparent portion of sclera is called cornea  
 iv) When all cones are stimulated equally a sensation of no light is produced  
 a) Only ii b) ii and iv c) all of these d) all except ii
156. We know that thyroxine controls metabolism in body. An autoimmune disease where the body's own antibodies attack the cells of the thyroid is called \_\_\_\_\_  
 a) Hyperthyroidism b) Hashimoto's disease  
 c) Grave's disease d) Turner syndrome
157. Trapped dust particles are pushed out of respiratory tract by \_\_\_\_\_  
 a) Squamous epithelium b) glandular epithelium  
 c) Ciliated epithelium d) Compound epithelium
158. If a germ cell in female gonad and that in male gonad begin to undergo meiosis simultaneously, what would be the ratio of ova and sperms produced?  
 a) 1:1 b) 1:2 c) 1:4 d) 4:1
159. Maturation of sperm before the penetration of egg is known as \_\_\_\_\_  
 a) spermiogenesis b) spermateleosis c) spermatid d) capacitation
160. Evolutionary biology is \_\_\_\_\_  
 a) The study of history of life forms on earth b) Study of pedigrees of life forms on earth  
 c) Equivalent to demography d) equivalent to anthropology



161. Which one of the following statements is incorrect?  
 a) Mesoglea is present in between ectoderm and endoderm in Obelia  
 b) Asterias exhibits radial symmetry  
 c) Fasciola is a pseudocoelomate animal  
 d) Taenia is a triploblastic animal
162. Which of the following is the constituent of pancreatic juices?  
 a) Sodium bicarbonate and three proenzymes  
 b) Potassium bicarbonate and three proenzymes  
 c) Sodium bicarbonate and five proenzymes  
 d) Potassium bicarbonate and five proenzymes
163. Which one of the following statements is/are correct?  
 I. Frenulum is the fold by which tongue is attached to the floor of mouth or oral cavity.  
 II. Lower surface of the tongue has little projection which bears the taste buds.  
 III. Pharynx is the common passage for food and air.  
 IV. Sphincter of Oddi guards and regulates the opening of stomach into duodenum.  
 V. Descending part of the colon opens into the rectum.  
 a) I,II and III are correct  
 b) IV and V are correct  
 c) I,II,III,IV and V  
 d) I,III and V are correct
164. Western ghats have a greater amphibians diversity than the Eastern ghats. It is an example of \_\_\_\_\_  
 a) Species diversity  
 b) genetic diversity  
 c) Ecological diversity  
 d) none of these
165. Which of the following statement belongs to a stable community?  
 a) Productivity of community should not vary too much from year to year  
 b) Community should be resistant to occasional natural and man made disturbances  
 c) Community should be resistant to invasions by alien species  
 d) All of the above
166. The gross primary productivity of an ecosystem is 160 tons of organic matter. Its 25% is used in respiration. Calculate NPP  
 a) 120 tons  
 b) 40 tons  
 c) 110 tons  
 d) 200 tons
167. Given below is one of the types of ecological pyramids



This type represents

- a) Pyramid of numbers in a grassland ecosystem  
 b) Pyramid of energy in forest ecosystem  
 c) Pyramid of biomass in a sea ecosystem  
 d) Pyramid of biomass in terrestrial ecosystem
168. For the control of air pollution in Delhi, all buses of Delhi were converted to run on \_\_\_\_\_ by the end of \_\_\_\_\_ as per the directives of the \_\_\_\_\_  
 a) A- compressed natural gas, B – 2000, C- high court  
 b) A – Shale gas, B – 2001, C- Central government  
 c) A- Compressed Natural gas, B- 2002, C-supreme court  
 d) A – liquid pressure gas compressed natural gas, B- 2003, C- Delhi government

169. Which one of the following statements is true for cockroach?  
 a) The number of ovarioles in each ovary are ten  
 b) The larval stages is called caterpillar  
 c) Anal styles are absent in females  
 d) They are ureotelic
170. Which of the following is not an example of adaptive radiation?  
 a) Wombat, marsupial rat, flying phalanges  
 b) Darwin's finches  
 c) Different placental mammals in Australia  
 d) Placental wolf and Tasmanian wolf
171. Darwin judged the fitness of an individual by \_\_\_\_\_  
 a) Ability to defend itself  
 b) strategy to obtain food  
 c) Number of offsprings  
 d) Dominance over other individuals
172. Which of the following health disorder includes symptoms of fever, Chills, cough, headache, gray or bluish lips and finger's nails?  
 a) Filariasis                      b) Typhoid                      c) Pneumonia                      d) Malaria
173. Yeast is used in the production of \_\_\_\_\_  
 a) Citric acid and lactic acid                      b) lipase and pectinase  
 c) Bread and beer                      d) cheese and butter
174. Benefits of mycorrhiza are \_\_\_\_\_  
 I. Resistance to root borne pathogen                      II. Tolerance to salinity and pathogen  
 III. overall increase in the plant growth and development  
 Choose the correct option  
 a) I and II                      b) I and III                      c) II and III                      d) I,II and III
175. Respiratory centre of the brain is stimulated by \_\_\_\_\_  
 a) Carbon dioxide content in venous blood                      b) Carbon dioxide content in arterial blood  
 c) Oxygen content in arterial blood                      d) Oxygen content in venous blood
176. The total thickness of the diffusion membrane of alveolus capillary is \_\_\_\_\_  
 a) Less than 1 cm                      b) less than 2 cm  
 c) less than 1 mm                      d) more than 1 mm
177. Vaccines, when introduced into the body stimulates the production of \_\_\_\_\_  
 a) Antigen                      b) antibody                      c) NK cells                      d) macrophages
178. What is the true approximate percentage of the earth covered by hotspots?  
 a) 2.5%                      b) 3.5%                      c) 1.5% (less than 2%)                      d) 4.5%
179. Siberian cranes are regular visitors of \_\_\_\_\_  
 a) Bharatpur sanctuary, Rajasthan                      b) Lalbagh, Bengluru  
 c) Vedanthangal sanctuary, Tamil Nadu                      d) Jim Corbett national park
180. Ejaculatory duct of the male receives secretion of \_\_\_\_\_  
 a) Prostate gland, seminal vesicle, Bulbourethral gland  
 b) Testis, seminal vesicle  
 c) Seminal vesicles, prostate gland  
 d) Prostate gland, epididymis, testis
181. \_\_\_\_\_ is used in the manufacture of many items including cosmetics, shaving creams and polishes of various kinds. The most appropriate word for filling the blank is  
 a) Bee wax                      b) honey                      c) latex                      d) resin
182. Catalytic converters are fitted into automobiles to reduce the emission of harmful gases, Catalytic converters changes nitric oxide into \_\_\_\_\_  
 a) Carbon dioxide and water                      b) carbon monoxide and nitrogen  
 c) Nitrogen                      d) Methane

183. Which of the following statements are correct about cervical caps?  
 A. Barrier method of contraception  
 B. Protect the user from contracting STD  
 C. They are reusable  
 D. Prevent the sperm from meeting ovum  
 a) B,C and D only                      b) A,C and D only    c) A,B and D only        d) A,B,C and D only
184. Which of the following part of cockroach's alimentary canal secrete digestive juices?  
 a) Malpighian tubule                      b) proventriculs        c) caecae                      d) crop
185. Hemichordates have now been placed with the non chordates close to the echinoderms because \_\_\_\_\_  
 a) Notochord is absent                      b) pharyngeal gill slits are lacking  
 c) Dorsal nerve cord is absent                      d) Heart is lacking

### PART - B (ZOOLOGY)

186. Hormones are called chemical signals that stimulate specific target tissues. Their specificity is due to the presence of signal receiving receptors only in the respective target tissues. Where are these receptors present in case of hormones of protein nature?  
 a) Extra cellular matrix                      b) blood                      c) plasma membrane                      d) nucleus
187. Which of the following statements is not true?  
 a) The partial pressure of oxygen in deoxygenated blood is 40 mm Hg  
 b) The partial pressure of oxygen in oxygenated blood is 95 mm Hg  
 c) The partial pressure of oxygen in the alveolar air is 104 mm Hg  
 d) The partial pressure of carbon dioxide in deoxygenated blood is 95 mmHg
188. Primary producers convert only \_\_\_\_\_ of the energy in the sunlight available to them into NPP  
 a) 1%                      b) 5%                      c) 10%                      d) 15%
189. Which of the following is incorrect about ribs?  
 a) Each rib is a thin flat bone connected dorsally to the vertebral column and ventrally to the sternum  
 b) Rib has two articulation surfaces on its dorsal end which are called bicephalic  
 c) Ventrally ribs are connected to sternum by elastic cartilage  
 d) First 7 pairs are called true ribs, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> pair is known as false ribs and 2 pair(11<sup>th</sup> and 12<sup>th</sup>) known as floating ribs
190. Osmoreceptors of body is activated due to changes in \_\_\_\_\_  
 a) Blood volume                      b) body fluid volume  
 c) Ionic concentration                      d) all of these
191. The new potential developed on post synaptic membrane is \_\_\_\_\_  
 a) always excitatory                      b) always inhibitory  
 c) may be excitatory or inhibitory                      d) Neither excitatory nor inhibitory
192. Arteries are best defined as the vessels which \_\_\_\_\_  
 a) Carry blood away from the heart to different organs  
 b) Break up into capillaries which reunite to form vein  
 c) Carry blood from one visceral organ to another visceral organ  
 d) Supply of oxygenated blood to the different organs
193. The term Echinodermata indicates the character of \_\_\_\_\_  
 a) Water vascular system                      b) Enterocoelom  
 c) Schizocoelom                      d) spiny skin

194. Which of the following secretions get mixed with the food in the small intestine?  
a) Bile, pancreatic juices and intestinal juices  
b) Pancreatic juices, intestinal juices and gastric juices  
c) Gastric juices, intestinal juices and bile  
d) Bile, gastric juice and salivary juices
195. The terga, sterna and pleura of cockroach are joined by \_\_\_\_\_  
a) Arthroal membrane      b) cartilage      c) cementing glue      d) muscle
196. True/False  
I. The total organic matter synthesized by the producers in the process of photosynthesis per unit area is known as primary productivity  
II. Net primary productivity is the weight of the organic matter stored by the producers in a unit area/volume per unit time  
a) I is true while II is false      b) II is true, while I is false  
c) I and II are true      d) I and II are false
197. A disease caused by eating fish contaminated by industrial waste containing mercury compounds is known as \_\_\_\_\_  
a) Bright's disease      b) Minimata disease      c) Hashimoto disease      d) Osteosclerosis
198. Reasons for alcohol abuse in adolescents are  
I. Social pressure  
II. Curiosity and need for adventure, excitement and experiment  
III. To escape from stress, depression and frustration  
IV. To overcome hardships of daily life  
Which of the statements given above are correct?  
a) I, II and III      b) I, III and IV      c) II, III and IV      d) I, II, III and IV
199. MOET is method of \_\_\_\_\_  
a) Fish cultivation      b) cloning in sheep  
c) Hybridization in cattle      d) Birth control in humans
200. A sexually transmitted disease symptomized by the development of chancre on the genitals is caused by the infection of \_\_\_\_\_  
a) Hepatitis B virus      b) HIV  
c) Neisseria gonorrhoea      d) Treponema pallidum