

# PHYSICS, CHEMISTRY AND BIOLOGY

<b>Class</b>	<b>II NEET 2018-20</b>	<b>Max. Marks</b>	<b>720</b>
	<b>Intensive Revision Program</b>	<b>Duration</b>	<b>3 Hours</b>
	<b>Full Test – 01</b>	<b>Date</b>	<b>07-06-2020</b>

## Instructions

- The test paper contains 180 multiple choice questions under four parts: Part I - Physics, Part II – Chemistry and Part III - Biology. Answer all the questions.
- Each question carries four marks for correct answer and one negative mark for wrong answer. Multiple markings for the same question will be treated as wrong answer and will carry one negative mark.
- For each question there are four options of which one option is correct. Choose the correct option and darken the appropriate circle in the response sheet.
- Rough work can be done on the question paper itself.
- Calculator / Log table is not allowed.

## OMR Instructions

- Complete the particulars on side 1 of the OMR response sheet.
- Ensure that the student ID is written on both sides of OMR response sheet.
- Marking of more than one option for the same question will render the answer invalid.

## PART I – PHYSICS

- A body of mass 10 kg is moved with uniform speed on a rough horizontal surface for a distance of 2 m. The work done is 150 J. The same body is moved over the same surface of an inclined plane of inclination  $30^\circ$  with horizontal for a distance of 2 m. The work done against the friction will be (take  $g = 10 \text{ m/s}^2$ )  
 (A) 250 J                      (B) 50 J                      (C) 150 J                      (D)  $(75\sqrt{3})\text{J}$
- An aeroplane requires for takeoff a speed of 81 km/hr, the run on ground being 100 m. The mass of aeroplane is 10,000 kg and co-efficient of friction between the plane and ground is 0.2. Assume that the plane accelerates uniformly during takeoff. The minimum force required by engine of the plane for takeoff is ( $g = 10 \text{ m/s}^2$ )  
 (A) 4.53 N                      (B)  $4.53 \times 10^4 \text{ N}$                       (C)  $4.53 \times 10^2 \text{ N}$                       (D)  $4.53 \times 10^6 \text{ N}$
- A particle of mass  $m$  is moving in a circular path of constant radius  $r$  such that its centripetal acceleration  $a_c$  is varying with time  $t$  as  $a_c = k^2 r t^2$ , where  $k$  is a constant. The power delivered to the particle by the force acting on it is  
 (A)  $2\pi m k^2 r^2 t$                       (B)  $m k^2 r^2 t$                       (C)  $\frac{(m k^4 r^2 t^5)}{3}$                       (D) zero
- A block of mass  $m$  is pulled along a horizontal surface by applying a force at an angle  $\theta$  with the horizontal. If the block travels with a uniform velocity and has a displacement  $d$  and the coefficient of friction is  $\mu$ , then the work done by the applied force is  
 (A)  $\frac{\mu m g d}{\cos \theta + \mu \sin \theta}$                       (B)  $\frac{\mu m g d \cos \theta}{\cos \theta + \mu \sin \theta}$                       (C)  $\frac{\mu m g d \sin \theta}{\cos \theta + \mu \sin \theta}$                       (D)  $\frac{\mu m g d \cos \theta}{\cos \theta - \mu \sin \theta}$

5. The density of a newly discovered planet is twice that of earth. The acceleration due to gravity at the surface of the planet is equal to that at the surface of the earth. If the radius of the earth is  $R$ , the radius of the planet would be  
 (A)  $4R$  (B)  $\frac{1}{4}R$  (C)  $\frac{1}{2}R$  (D)  $2R$
6. A rigid body of radius  $R$ , either hollow or solid, lies on a smooth horizontal surface. The body is pulled by a horizontal force acting tangentially from the highest point. The distance travelled by the body in the time in which it makes one full rotation is the same that it will make in one full rotation during pure rolling. The rigid body will be  
 (A) solid sphere (B) hollow sphere (C) circular disc (D) hollow cylinder
7. A particle starting from rest moves with a constant angular acceleration  $\alpha$  in a circular path. The time at which the magnitudes of tangential and radial acceleration are equal is  
 (A)  $\frac{1}{\alpha}$  (B)  $\alpha$  (C)  $\frac{1}{\sqrt{\alpha}}$  (D)  $\sqrt{\alpha}$
8. Certain amount of an ideal gas is contained in a closed vessel. The vessel is moving with a constant velocity  $v$ . The molecular mass of gas is  $M_0$ . The rise in temperature of the gas when the vessel is suddenly stopped is  $\left[ \gamma = \frac{C_p}{C_v} \right]$   
 (A)  $\frac{M_0 v^2}{2R(\gamma+1)}$  (B)  $\frac{M_0 v^2(\gamma-1)}{2R}$  (C)  $\frac{M_0 v^2}{2R\gamma}$  (D)  $\frac{M_0 v^2\gamma}{2R(\gamma-1)}$
9. During an adiabatic process, if the pressure of an ideal gas is proportional to the cube of its temperature, then ratio  $\gamma = \frac{C_p}{C_v}$  is (specific heat of constant volume =  $C_v$  ; Specific heat of constant pressure =  $C_p$ )  
 (A)  $\frac{7}{5}$  (B)  $\frac{4}{3}$  (C)  $\frac{5}{3}$  (D)  $\frac{3}{2}$
10. A particle executes linear simple harmonic motion with an amplitude of 2 cm. When the particle is at 1 cm from the mean position, the magnitude of its velocity is equal to that of its acceleration. The time period in second is  
 (A)  $\frac{1}{2\pi\sqrt{3}}$  (B)  $2\pi\sqrt{3}$  (C)  $\frac{2\pi}{\sqrt{3}}$  (D)  $\frac{\sqrt{3}}{2\pi}$
11. When a wave travels in a medium, the particle displacement is given by the equation  $y = a \sin 2\pi(bt - cx)$  where  $a$ ,  $b$  and  $c$  are constants. The maximum particle velocity will be twice the wave velocity if  
 (A)  $c = \frac{1}{\pi a}$  (B)  $c = \pi a$  (C)  $b = ac$  (D)  $b = \frac{1}{ac}$
12. When a drop of water is sprinkled on a red hot iron plate, it forms into small spheres but does not vapourise immediately because  
 (A) red hot iron is a poor conductor of heat  
 (B) a layer of water vapour in between the drop and the plate prevents the conduction of heat  
 (C) boiling point of water is raised  
 (D) boiling point of water decreases.

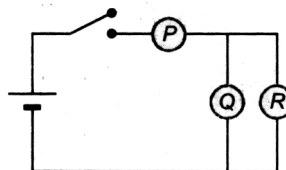
13. On the horizontal surface of a truck, a block of mass 1 kg is placed ( $\mu = 0.6$ ) and truck is moving with acceleration  $5 \text{ ms}^{-2}$ . Then the frictional force on the block will be  
 (A) 5 N (B) 0.588 N (C) 5.88 N (D) 8 N
14. An automobile of mass  $m$  is crossing over a convex upwards bridge with a speed  $v$ . If the radius of the bridge is  $r$ , the thrust on the bridge at the highest point will be  
 (A)  $mg + \frac{mv^2}{r}$  (B)  $mg - \frac{mv^2}{r}$  (C)  $\frac{mv^2}{r}$  (D)  $mg$
15. A rope of length 8 m and linear density  $0.5 \text{ kg m}^{-1}$  is lying lengthwise on a horizontal smooth floor. It is pulled by a force of 12 N. The tension at the mid-point would be  
 (A) 12 N (B) 8 N (C) 6 N (D) 4 N
16. The stationary wave produced on a string is represented by the equation  $y = 5 \sin\left(\frac{\pi x}{3}\right) \cos 40\pi t$  where  $x$  and  $y$  are in cm and  $t$  is in seconds. The distance between two consecutive nodes is  
 (A) 5 cm (B) 3 cm (C) 6 cm (D) 40 cm
17. On sounding tuning fork A with another tuning fork B of frequency 384 Hz, 6 beats are produced per second. After loading the prongs of A with some wax and then sounding it again with B, 4 beats are produced per second. The frequency of the tuning fork A is  
 (A) 388 Hz (B) 382 Hz (C) 380 Hz (D) 390 Hz
18. The length, breadth and thickness of a block are given by  $l = 12 \text{ cm}$ ,  $b = 6 \text{ cm}$  and  $t = 2.45 \text{ cm}$ . The volume of the block according to the idea of significant figures should be  
 (A)  $1 \times 10^2 \text{ cm}^3$  (B)  $2 \times 10^2 \text{ cm}^3$   
 (C)  $1.763 \times 10^2 \text{ cm}^3$  (D)  $1 \times 10^2 \text{ cm}^3$
19. A body of mass 2 kg makes an elastic collision with another body at rest and continues to move in the original direction with one fourth of its original speed. The mass of the second body which collides with the first body is  
 (A) 2 kg (B) 1.2 kg (C) 3 kg (D) 1.5 kg
20. A river is flowing from west to east at a speed of  $5 \text{ m s}^{-1}$ . A man on the south bank of the river, capable of swimming at  $10 \text{ m s}^{-1}$  in still water, wants to swim across the river in the shortest time. He should swim in a direction  
 (A) due north (B)  $30^\circ$  east of north  
 (C)  $30^\circ$  west of north (D)  $60^\circ$  east of north
21. A bomb of 12 kg explodes into two pieces of masses 4 kg and 8 kg. The velocity of 8 kg mass is 6 m/s. The kinetic energy of the other mass is  
 (A) 48 J (B) 32 J (C) 24 J (D) 288 J
22. A negatively charged oil drop is prevented from falling under gravity by applying a vertical electric field of  $100 \text{ Vm}^{-1}$ . If the mass of the drop is  $1.6 \times 10^{-3} \text{ g}$ , the number of electrons carried by the drop is ( $g = 10 \text{ ms}^{-2}$ )  
 (A)  $10^{18}$  (B)  $10^{15}$  (C)  $10^6$  (D)  $10^{12}$

23. Out of two copper spheres of the same size, x is hollow while y is solid. If they are charged at the same potential, then
- (A) Sphere y will have more charge (B) Sphere x will have more charge  
(C) Charge on both the spheres is zero (D) Charge on both the spheres is equal

24. Electric current through a conductor varies with time as  $I(t) = 50 \sin(100\pi t)$ . Here I is in ampere and t in second. Total charge that passes through any point from  $t = 0$  to  $t = \frac{1}{200}$  s is
- (A) 1.2 C (B) 0.36 C (C) 0.16 C (D) 0.02 C

25. Three identical bulbs P, Q and R are connected to a battery as shown in figure. When the circuit is closed,

- (A) Q and R will be brighter than P  
(B) Q and R will be dimmer than P  
(C) All the bulbs will be equally bright  
(D) Q and R will not shine at all

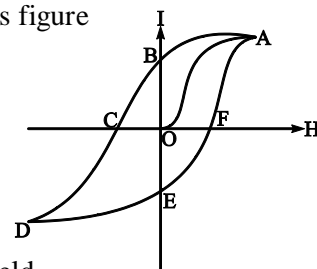


26. A charge q moves with a velocity  $2 \text{ ms}^{-1}$  along X-axis in a uniform magnetic field  $(\vec{B}) = (\hat{i} + 2\hat{j} + 3\hat{k})\text{T}$ . The charge will experience a force that lies
- (A) along - y axis (B) along - z axis  
(C) along + z axis (D) in yz plane

27. A proton experience a force  $\vec{F}_1 = e(-\hat{j} + \hat{k})\text{N}$  in a magnetic field  $\vec{B}$  when it has a velocity  $\vec{v}_1 = 1\hat{i} \text{ ms}^{-1}$ . The force becomes  $\vec{F} = e(\hat{i} - \hat{k})\text{N}$  when the velocity is changed to  $\vec{v}_2 = 1\hat{j} \text{ ms}^{-1}$ . The magnetic induction vector at that point is
- (A)  $(\hat{i} - \hat{j} - \hat{k})\text{T}$  (B)  $(-\hat{i} - \hat{j} + \hat{k})\text{T}$  (C)  $(\hat{i} + \hat{j} - \hat{k})\text{T}$  (D)  $(\hat{i} + \hat{j} + \hat{k})\text{T}$

28. The I - H curve for a ferromagnetic material is as shown in the figure. In this figure

- (A) OC is a measure of the retentivity.  
(B) OB is a measure of coercivity.  
(C) Area enclosed by the curve ABCDEA represents the energy lost during one cycle of magnetisation.  
(D) Area enclosed by the curve ABCDEA represents the work done in orientating the molecular dipoles along the direction of the external field.

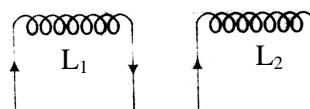


29. Two coils P and S have 2000 turns and 5000 turns respectively. A current of 1A in coil P causes a flux per turn of  $0.8 \times 10^{-3}$  weber to link with P and  $0.4 \times 10^{-3}$  weber through S. The ratio of coefficient of self-inductance of P and the coefficient of mutual inductance of P and S is

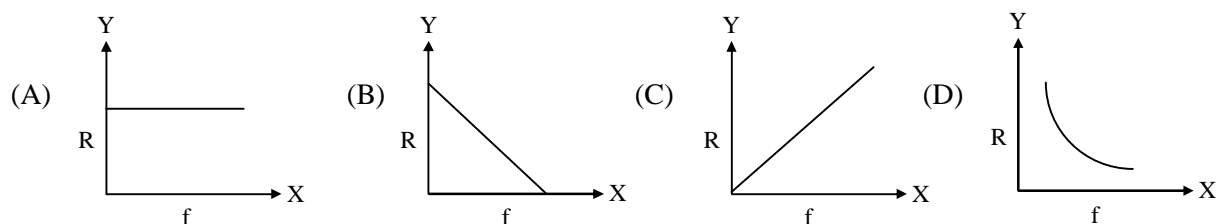
- (A)  $\left(\frac{2}{3}\right)$  (B)  $\left(\frac{3}{4}\right)$  (C)  $\left(\frac{4}{5}\right)$  (D)  $\left(\frac{5}{4}\right)$

30. A circuit contains two inductors of self-inductance  $L_1$  and  $L_2$  in series. If M is the mutual inductance then the effective inductance of the circuit shown will be

- (A)  $L_1 + L_2$  (B)  $L_1 + L_2 - 2M$   
(C)  $L_1 + L_2 + M$  (D)  $L_1 + L_2 + 2M$



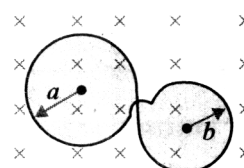
31. The correct graph between the resistance of a conductor with frequency is



32. Figure shows a pattern of loop of radii  $a$  and  $b$  ( $a > b$ ) placed in a time varying magnetic field  $\frac{dB}{dt} = k$ , which is perpendicular to the plane of the loops. If the resistance per unit length of the wire is  $\lambda$ , then induced current is

(A)  $\frac{k(a^2 + b^2)}{2\lambda(a+b)}$   
 (C)  $\frac{k(a-b)}{2\lambda}$

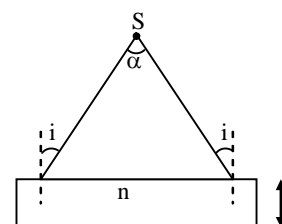
(B)  $\frac{k(a+b)}{2\lambda}$   
 (D)  $\frac{k(a-b)}{\lambda}$



33. One requires 11 eV of energy to dissociate a carbon monoxide molecule into carbon and oxygen atoms. The minimum frequency of the appropriate electromagnetic radiation to achieve the dissociation lies in  
 (A) Visible region (B) Infrared region  
 (C) Ultraviolet region (D) Microwave region.

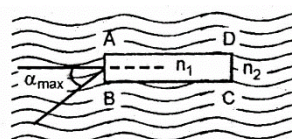
34. A diverging beam of light from a point source  $S$  having diverging angle  $\alpha$ , falls symmetrically on a glass slab as shown in the figure. The angles of incidence of the two extreme rays are equal. If the thickness of the glass slab is  $t$  and the refractive index  $n$ , then the divergence angle of emergent beam is

(A) zero (B)  $\alpha$   
 (C)  $\sin^{-1}\left(\frac{1}{n}\right)$  (D)  $2\sin^{-1}\left(\frac{1}{n}\right)$



35. A rectangular glass of slab ABCD, of refractive index  $n_1$ , is immersed in water of refractive index  $n_2$  ( $n_1 > n_2$ ). A ray of light is incident at the surface AB of the slab as shown. The maximum value of the angle of incidence  $\alpha_{\max}$  such that the ray comes out only from the other surface CD is given by

(A)  $\sin^{-1}\left[\frac{n_1}{n_2} \cos^{-1}\left(\sin^{-1} \frac{n_2}{n_1}\right)\right]$  (B)  $\sin^{-1}\left[n_1 \cos\left(\sin^{-1} \frac{1}{n_2}\right)\right]$   
 (C)  $\sin^{-1}\left(\frac{n_1}{n_2}\right)$  (D)  $\sin^{-1}\left(\frac{n_2}{n_1}\right)$



36. Two identical metal plates show photoelectric effect by a light of wavelength  $\lambda_A$  falling on plate A and  $\lambda_B$  on plate B ( $\lambda_A = 2\lambda_B$ ). The maximum kinetic energies related as

(A)  $2K_A = K_B$  (B)  $K_A < \frac{K_B}{2}$  (C)  $K_A = 2K_B$  (D)  $K_A > \frac{K_B}{2}$

37. A surface irradiated with light of wavelength 480 nm gives out electrons with maximum velocity  $v \text{ ms}^{-1}$ , the cut off wavelength being 600 nm. The same surface will release electron with maximum velocity  $2v \text{ m/s}$  if it irradiated by light of wavelength

(A) 260 nm (B) 300 nm (C) 360 nm (D) 400 nm

38. If  $R$  is the Rydberg's constant for hydrogen, the wave number of the first line in the Lyman series will be  
 (A)  $\frac{R}{4}$  (B)  $\frac{3R}{4}$  (C)  $\frac{R}{2}$  (D)  $2R$
39. When an electron in hydrogen atom in ground state absorbs a photon of energy 12.1 eV, its angular momentum  
 (A) decreases by  $2.11 \times 10^{-34}$  Js (B) increases by  $1.055 \times 10^{-34}$  Js  
 (C) decreases by  $1.055 \times 10^{-34}$  Js (D) increases by  $2.11 \times 10^{-34}$  Js
40. The radioactivity of a sample is  $X$  at a time  $t_1$  and  $Y$  at a time  $t_2$ . If the mean life of the specimen is  $\tau$ , the number of atoms that have disintegrated in the interval  $(t_2 - t_1)$  is  
 (A)  $\frac{(X+Y)\tau}{2}$  (B)  $\frac{(X-Y)}{\tau}$  (C)  $(X-Y)\tau$  (D)  $(X+Y)\tau$
41. A transistor amplifier has  $\beta = 75$ ,  $R_L = 6 \text{ k}\Omega$  internal resistance of the base is  $R_i = 1.5 \text{ k}\Omega$ , then the voltage gain of the common emitter amplifier is  
 (A) 150 (B) 300 (C) 475 (D) 600
42. A pure silicon crystal of length  $l (= 0.1 \text{ m})$  and area  $A (= 10^{-4} \text{ m}^2)$  has the mobility of electrons and holes as  $0.135 \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$  and  $0.048 \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$  respectively. If the voltage applied across it is 2V and intrinsic charge concentration is  $n_i = 1.5 \times 10^6 \text{ m}^{-3}$ , then the total current flowing through the crystal is  
 (A)  $4.39 \times 10^{-17} \text{ A}$  (B)  $8.7 \times 10^{-17} \text{ A}$  (C)  $13.17 \times 10^{-17} \text{ A}$  (D)  $2.19 \times 10^{-17} \text{ A}$
43. The resonance frequency of the LCR circuit of an oscillator when  $L = \frac{10}{\pi^2} \text{ mH}$  and  $C = 0.04 \text{ }\mu\text{F}$  are connected in parallel is  
 (A) 250 kHz (B) 25 kHz (C) 2.5 kHz (D) 25 MHz
44. A beam of natural light falls on a system of 6 polaroids, which are arranged in succession such that each polaroid is turned through  $30^\circ$  with respect to the preceding one. The percentage of incident intensity that passes through the system will be  
 (A) 100 % (B) 50 % (C) 30 % (D) 12 %
45. In Young's experiment, the distance between slits is 0.28 mm and distance between slits and screen is 1.4 m. Distance between central bright fringe and third bright fringe is 0.9 cm. The wavelength of light used is  
 (A) 5000 Å (B) 6000 Å (C) 7000 Å (D) 4358 Å

## PART II – CHEMISTRY

46. The wave number of the series limiting line for the Paschen series for hydrogen atom is ( $R = 109678 \text{ cm}^{-1}$ )  
 (A)  $82259 \text{ cm}^{-1}$  (B)  $109678 \text{ cm}^{-1}$  (C)  $12186 \text{ cm}^{-1}$  (D)  $9.1176 \times 10^{-6} \text{ cm}^{-1}$
47. A species having only one electron has ionization energy of  $11810 \text{ kJ mol}^{-1}$ . The number of protons in its nucleus will be.  
 (A) 1 (B) 2 (C) 3 (D) 4
48. The valency of carbon in  $\text{CO}_3^{2-}$  is

- (A) 2 (B) 3 (C) 4 (D) -3

49. Among of the following species, the one that has least bond angle is

- (A)  $\text{H}_2\text{O}$  (B)  $\text{H}_2\text{S}$  (C)  $\text{H}_2\text{Se}$  (D)  $\text{H}_2\text{Te}$

50. The equilibrium constant at 717 K for the reaction  $\text{HI}(\text{g}) \rightleftharpoons \frac{1}{2}\text{H}_2(\text{g}) + \frac{1}{2}\text{I}_2(\text{g})$

if its value for the reaction  $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$  at 717 K is 64

- (A) 64 (B) 8 (C)  $\frac{1}{64}$  (D)  $\frac{1}{8}$

51. Conjugate base of hydrazoic acid is

- (A)  $\text{HN}_3^-$  (B)  $\text{N}_2^-$  (C)  $\text{N}_3^-$  (D)  $\text{N}^{3-}$

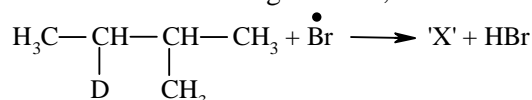
52. The IUPAC name of the following compound  $\text{CH}_2=\text{CH}-\text{CH}_2\text{OH}$  is

- (A) allyl alcohol (B) vinyl alcohol  
(C) 3-hydroxyprop-1-ene (D) prop-2-en-1-ol

53. 0.765 g of an acid gives 0.505 g of  $\text{CO}_2$  and 0.12 g of  $\text{H}_2\text{O}$ . Then, the ratio of the percentage of carbon and hydrogen is

- (A) 19 : 2 (B) 18 : 11 (C) 20 : 17 (D) 9 : 1

54. Consider the following reaction,




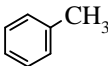


The structure of the major product 'X' is

- (A)  $\text{CH}_3-\underset{\text{D}}{\text{CH}}-\underset{\text{CH}_3}{\text{CH}}-\dot{\text{C}}\text{H}_2$  (B)  $\text{CH}_3-\underset{\text{D}}{\text{CH}}-\underset{\text{CH}_3}{\dot{\text{C}}}-\text{CH}_3$   
(C)  $\text{CH}_3-\underset{\text{D}}{\dot{\text{C}}}-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_3$  (D)  $\text{CH}_3-\dot{\text{C}}\text{H}-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_3$

55.  $\text{HC}\equiv\text{CH}$  reacts with excess of acetic acid in presence of  $\text{Hg}^{2+}$  to give

- (A)  $\text{CH}_3\text{CH}(\text{OCOCH}_3)_2$  (B)  $\text{CH}(\text{OOCCH}_3)_2$  (C)  $\text{CH}_3\text{CH}_2\text{OOCCH}_3$  (D)  $\text{H}_3\text{C}-\text{CH}_2-\text{COOH}$   
 $\text{CH}(\text{OOCCH}_3)_2$

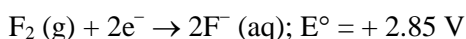
56. A anti-aromatic compound among the following is

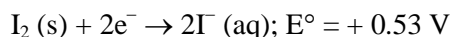
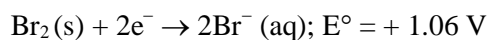
- (A)  (B)  (C)  (D) 

57.  $\text{Al}_2\text{O}_3$  is reduced by electrolysis at low potential and high current. If  $4.0 \times 10^4$  amperes of current is passed through molten  $\text{Al}_2\text{O}_3$  for 6 hours, the mass of aluminium produced is (At. mass of  $\text{Al} = 27 \text{ g mol}^{-1}$ )

- (A)  $8.1 \times 10^4 \text{ g}$  (B)  $2.4 \times 10^5 \text{ g}$  (C)  $7.5 \times 10^4 \text{ g}$  (D)  $9.0 \times 10^3 \text{ g}$

58. Standard reduction potentials of the half reactions are given below





The strongest oxidizing and reducing agents respectively are

- (A)  $\text{Cl}_2$  and  $\text{Br}^-$                       (B)  $\text{Cl}_2$  and  $\text{I}_2$                       (C)  $\text{F}_2$  and  $\text{I}_2$                       (D)  $\text{F}_2$  and  $\text{I}^-$

59. A device that converts energy of combustion of fuels like hydrogen and methane directly into electrical energy is known as

- (A) dynamo                                      (B) Ni-Cd cell  
(C) fuel cell                                      (D) electrolytic cell

60. Sulphur trioxide can be obtained from

- (A)  $\text{CaSO}_4 + \text{C} \xrightarrow{\Delta}$                       (B)  $\text{Fe}_2(\text{SO}_4)_3 \xrightarrow{\Delta}$   
(C)  $\text{S} + \text{H}_2\text{SO}_4 \xrightarrow{\Delta}$                       (D)  $\text{H}_2\text{SO}_4 + \text{PCl}_5 \xrightarrow{\Delta}$

61. The species having equal number of  $\sigma$ - and  $\pi$ - bonds is

- (A)  $(\text{CN})_2$                       (B)  $\text{CH}_2(\text{CN})_2$                       (C)  $\text{HCO}_3^-$                       (D)  $\text{XeO}_4$

62. According to IUPAC nomenclature, sodium nitroprusside is named as

- (A) Sodium nitroferricyanide  
(B) Sodium nitroferrocyanide  
(C) Sodium pentacyanonitrosoniumferrate (II)  
(D) Sodium pentacyano nitrosylferrate (III)

63. The hybridization involved in the complex  $[\text{Ni}(\text{CN})_4]^{2-}$  is (At. No. Of Ni = 28)

- (A)  $d^2sp^2$                       (B)  $d^2sp^3$                       (C)  $dsp^2$                       (D)  $sp^3$

64. Among the following compound, the one that will give a secondary alcohol on reaction with Grignard reagent followed by acid hydrolysis is

- (1)  $\text{HCHO}$                                       (2)  $\text{C}_2\text{H}_5\text{CHO}$   
(3)  $\text{CH}_3\text{COCH}_3$                                       (4)  $\text{HCOOC}_2\text{H}_5$   
(A) 2 only                      (B) 3 only                      (C) 1 and 4                      (D) 2 and 4

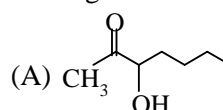
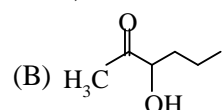
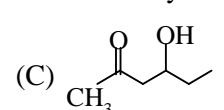
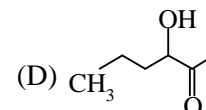
65. Product C in the reaction,  $\text{C}_2\text{H}_5\text{Br} \xrightarrow[\text{(aqueous)}]{\text{NaOH}} \text{A} \xrightarrow{\text{Na}} \text{B} \xrightarrow{\text{CH}_3\text{I}} \text{C}$  will be

- (A) ethanol                      (B) ethyl iodide                      (C) ethane                      (D) ethyl methyl ether

66. The product 'B' in the sequence of reaction  $\text{CH} \equiv \text{CH} \xrightarrow[\text{HgSO}_4]{30\% \text{H}_2\text{SO}_4} \text{A} \xrightarrow[\Delta]{\text{NaOH}} \text{B}$

- (A)  $\text{CH}_3\text{--CH=CH--CHO}$                       (B)  $\text{CH}_3\text{COOH}$   
(C)  $\text{CH}_3\text{CHO}$                       (D)  $\text{CH}_3\text{--}\underset{\text{OH}}{\text{CH}}\text{--CH}_2\text{--CHO}$

67. Among the following compounds, the one that will be most readily dehydrated is

- (A)                       (B)                       (C)                       (D) 

68. Propionic acid with  $\text{Br}_2/\text{P}$  yields a dibromo product. Its structure would be

- (A)  $\text{CHBr}_2\text{--CH}_2\text{COOH}$                       (B)  $\text{CH}_2\text{Br--CH}_2\text{--COBr}$




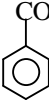
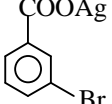


69. 4 g carbon is heated with 8 g of sulphur. The percentage purity of carbon disulphide ( $\text{CS}_2$ ) in the final product obtained is  
(A) 59.2% (B) 69.2% (C) 79.2% (D) 89.2%
70. An open vessel at  $27^\circ\text{C}$  is heated until  $\frac{3}{5}$  parts of the air in it has been expelled. Assuming that the volume of the vessel remains constant, the temperature to which the vessel has been heated is  
(A) 500 K (B) 750 K (C) 1000 K (D) 1250 K
71. When 100 g of water is electrolysed at constant pressure of 1 atmosphere and temperature of  $20^\circ\text{C}$ , the work of expansion is  
(A)  $-203.8 \text{ kJ}$  (B)  $-20.6 \text{ kJ}$  (C)  $-23.6 \text{ kJ}$  (D)  $-101.9 \text{ kJ}$
72. The correct decreasing order of their melting points is  
(A)  $\text{Si} > \text{Ge} > \text{Sn} > \text{Pb}$  (B)  $\text{Si} > \text{Ge} > \text{Pb} > \text{Sn}$   
(C)  $\text{Ge} > \text{Si} > \text{Pb} > \text{Sn}$  (D)  $\text{Sn} > \text{Pb} > \text{Ge} > \text{Si}$
73. If spheres of radius 'r' are arranged in ccp fashion (ABC ABC...), the vertical distance between any two consecutive A layers is  
(A)  $4r\sqrt{\frac{2}{3}}$  (B)  $4r\sqrt{\frac{3}{2}}$  (C)  $6r$  (D)  $r\sqrt{6}$
74. The mass of concentrated nitric acid required to prepare 250 mL of 2.0 M  $\text{HNO}_3$  is  
(The concentrated nitric acid is 70%  $\text{HNO}_3$ )  
(A) 45.0 g conc  $\text{HNO}_3$  (B) 90.0 g conc  $\text{HNO}_3$   
(C) 70.0 g conc  $\text{HNO}_3$  (D) 54.0 g conc  $\text{HNO}_3$
75. The correct ascending order of adsorption of the following gases on the same mass of charcoal at the same temperature and pressure is  
(A)  $\text{CH}_4 < \text{H}_2 < \text{SO}_2$  (B)  $\text{H}_2 < \text{CH}_4 < \text{SO}_2$   
(C)  $\text{SO}_2 < \text{CH}_4 < \text{H}_2$  (D)  $\text{H}_2 < \text{SO}_2 < \text{CH}_4$
76. The decomposition of  $\text{N}_2\text{O}_5$  in  $\text{CCl}_4$  at 318 K is studied by monitoring the concentration of  $\text{N}_2\text{O}_5$  in the solution. Initially, the concentration of  $\text{N}_2\text{O}_5$  is  $2.4 \text{ mol L}^{-1}$  and after 200 minutes, it is reduced to  $2.00 \text{ mol L}^{-1}$ . The rate of production of  $\text{NO}_2$  during this period in  $\text{mol L}^{-1} \text{ min}^{-1}$  is  
(A)  $4 \times 10^{-3}$  (B)  $2 \times 10^{-3}$   
(C)  $5 \times 10^{-3}$  (D)  $7 \times 10^{-3}$
77. The incorrect statement about the interstitial compounds is  
(A) They retain metallic conductivity.  
(B) They are chemically reactive.  
(C) They are much harder than the pure metal.  
(D) They have higher melting points than the pure metal.
78. "Metals are usually not found as nitrates in their ores" Out of the following two (I and II) reasons, the one that is/are true for the above observation is

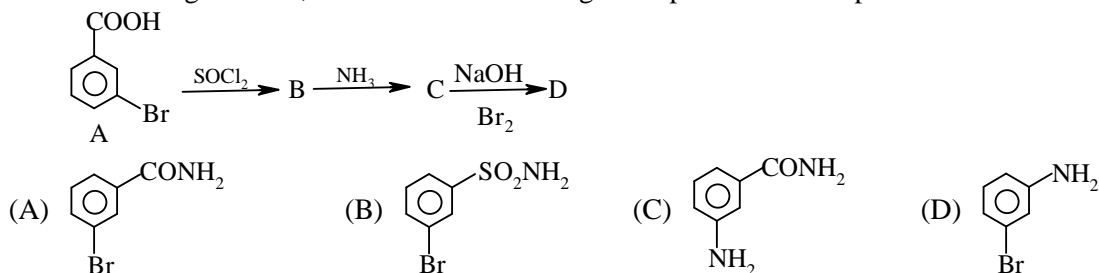
- I. Metal nitrates are highly unstable.  
 II. Metal nitrates are highly soluble in water.  
 (A) I is false but II is true  
 (C) I and II are true

- (B) I is true but II is false  
 (D) I and II are false

79. Silver benzoate reacts with bromine in refluxing  $\text{CCl}_4$  to form

- (A)  (B)  (C)  (D)  $\text{C}_6\text{H}_5\text{Br}$

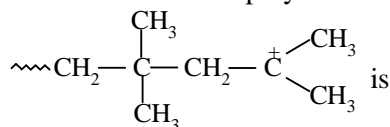
80. In the following reaction, m-bromobenzoic acid gives a product D. The product D is



81. The amino acids with the lowest isoelectric point is

- (A) glycine (B) alanine (C) aspartic acid (D) lysine

82. The monomer of the polymer



- (A)  $\text{CH}_3\text{CH}=\text{CHCH}_3$  (B)  $\text{CH}_3\text{CH}=\text{CH}_2$   
 (C)  $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_3)_2$  (D)  $\text{H}_2\text{C}=\text{C}(\text{CH}_3)_2$

83. Antihistamine among the following is

- (A) Ranitidine (B) Lansoprazole (C) Terfenadine (D) Luminal

84. The ion that are isoelectronic with  $\text{F}^-$  is

- (A)  $\text{S}^{2-}$  and  $\text{Mg}^{2+}$  or  $\text{Na}^+$  (B)  $\text{O}^{2-}$  and  $\text{Ca}^{2+}$  or  $\text{K}^+$   
 (C)  $\text{O}^{2-}$  and  $\text{Mg}^{2+}$  or  $\text{Li}^+$  (D)  $\text{O}^{2-}$  and  $\text{Mg}^{2+}$  or  $\text{Na}^+$

85. The paramagnetic species is

- (A)  $\text{KO}_2$  (B)  $\text{SiO}_2$  (C)  $\text{TiO}_2$  (D)  $\text{BeO}_2$

86. The decreasing order of the second ionization enthalpy of K, Ca and Ba is

- (A)  $\text{K} > \text{Ca} > \text{Ba}$  (B)  $\text{Ca} > \text{Ba} > \text{K}$  (C)  $\text{Ba} > \text{K} > \text{Ca}$  (D)  $\text{K} > \text{Ba} > \text{Ca}$

87. The incorrect statement among photochemical smog is

- (A) CO does not play any role in photochemical smog formation.  
 (B) Photochemical smog is an oxidising agent in character.  
 (C) Photochemical smog is formed through photochemical reaction involving solar energy.  
 (D) Photochemical smog does not cause irritation in eyes and throat.

88. When  $\text{H}_2\text{O}_2$  is oxidised by a suitable oxidant, one of the product is

- (A)  $O^{2-}$  (B)  $HO^{2-}$  (C)  $OH^-$  (D)  $O_2$
89. Oxidation number of chlorine is + 5 in  
 (A)  $Cl^-$  (B)  $ClO^-$  (C)  $ClO_2^-$  (D)  $ClO_3^-$
90. In acidic medium  $H_3PO_3$  gives  
 (A)  $H_3PO_2$  (B)  $H_3PO_3$  (C)  $H_3PO_4$  (D)  $(HPO_3)_n$

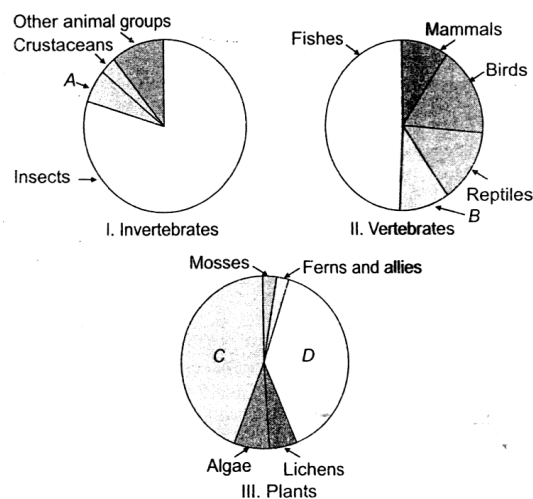
### PART III – BIOLOGY

91. PTH is a  
 (A) hypercalcemic hormone (B) hypocalcemic hormone  
 (C) endocalcemic hormone (D) exocalcemic hormone
92. Regulators are the animals which  
 (A) does not maintain their body homeostasis  
 (B) can maintain their body homeostasis  
 (C) can regulate their heart beat  
 (D) can regulate their circulation
93. The exotic species become invasive sometime and starts spreading fast because of  
 (A) natural predators  
 (B) abundant natural competitor  
 (C) invaded land does not have its natural predators  
 (D) mutation in their genome
94. Match the following columns.

Column I		Column II	
(a)	Scavengers	1.	Autotrophs
(b)	Parasites	2.	Heterotrophs
(c)	Producers	3.	Consumers that feed on a small part of a living being
(d)	Phagotrophs	4.	Consumers of dead bodies

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

95. Given below are pie diagrams I, II and III related to the proportionate number of species of major taxa of



invertebrates, vertebrates and plants respectively. Critically study and fill in the blanks A, B, C and D.

(A) A – Molluscs, B – Amphibians, C – Angiosperms,

D – Gymnosperms

(B) A – Molluscs, B – Amphibians, C – Fungi,

D – Angiosperms

(C) A – Turtles, B – Amphibians, C – Fungi,

D – Angiosperms

(D) A – Hexapoda, B – Amphibians, C – Fungi,

D – Angiosperms

96. The first stable product of Calvin cycle is

(A) 3-phosphoglycerate

(B) 1, 3 biphosphoglycerate

(C) glyceraldehyde - 3 phosphate

(D) ribulose - 5 - phosphate

97. The first carbon dioxide fixation product of C<sub>4</sub> plants is

(A) oxaloacetic acid

(B) ribulose biphosphate

(C) phosphoenol pyruvate

(D) phosphoglyceric acid

98. Lophodont (presence of transverse ridges on grinding surface) type of teeth among the following is

(A) incisor and canine

(B) canine and premolar

(C) premolar and molar

(D) premolar and incisor

99. Hiccups can be best described as

(A) forceful sudden expiration.

(B) forceful contraction of intercostals muscles during deep breathing.

(C) vibration of the soft palate during breathing while sleeping.

(D) jerky incomplete inspiration.

100. When kidney of a person is damaged, he/she invariably suffers from anaemia because

(A) RBCs pass through the glomerulus

(B) sufficient erythropoietin is not produced

(C) haemoglobin is not synthesised sufficiently

(D) iron and vitamin B<sub>12</sub> are not able to bind to haemoglobin.

101. **Statement 1:** Crassulacean acid metabolism occurs in succulent plants which grow in xeric conditions.

**Statement 2:** Stomata are generally sunken in succulent plants.

(A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.

(B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.

(C) Statement 1 is correct and statement 2 is incorrect.

(D) Both statements 1 and 2 are incorrect.

102. Temperature of the scrotum which is necessary for the functioning of testis is always around \_\_\_\_ below body temperature.

(A) 2 °C

(B) 4 °C

(C) 6 °C

(D) 8 °C

103. Which of the following have porous body and have cellular body organisation?

(A) *Aurelia* and *Obelia*

(B) *Adamsia* and *Euplectella*

(C) *Leucosolenia* and *Spongilla*

(D) *Sycon* and *Hydra*

104. Select among the following, an approach used for treatment of cancer.

(A) Gene therapy and immunotherapy

(B) Surgery

(C) Radiotherapy and Chemotherapy

(D) All of (A), (B) and (C)

105. A protozoan among the following is

(A) *Entamoeba histolytica*

(B) *E.coli*

(C) *Streptococcus pneumonia*

(D) *Trichophyton*.

106. Match the following columns and select the correct option.

	Column I		Column II
(a)	<i>Panthera tigris</i>	(i)	Mango
(b)	<i>Mangifera indica</i>	(ii)	Common Indian frog
(c)	<i>Musca domestica</i>	(iii)	Cockroach
(d)	<i>Periplaneta americana</i>	(iv)	Tiger
(e)	<i>Rana tigrina</i>	(v)	House fly

(A) a - (ii), b - (v), c - (i), d - (iii), e - (iv)

(B) a - (iv), b - (i), c - (v), d - (iii), e - (ii)

(C) a - (ii), b - (v), c - (iii), d - (i), e - (iv)

(D) a - (iv), b - (i), c - (v), d - (ii), e - (iii)

107. Choose a wrongly matched pair among the following.

(A) Haemoglobin in mammals - RBC

(B) Haemozoin - *Plasmodium* infection by product

(C) Haemocyanin – *periplanata* species

(D) Haemoglobin dissolved in blood - *Pheretima*

108. Cork cambium results in the formation of cork which becomes impermeable to water due to the accumulation of

(A) resin

(B) suberin

(C) lignin

(D) tannin

109. In the sieve elements, which one of the following is the most likely function of p-proteins?

(A) Deposition of callose on sieve plates

(B) Providing energy for active translocation

(C) Autolytic enzymes

(D) Sealing mechanism on wounding

110. Cell theory was proposed by

(A) a botanist

(B) a zoologist

(C) a botanist and a zoologist

(D) a psychologist

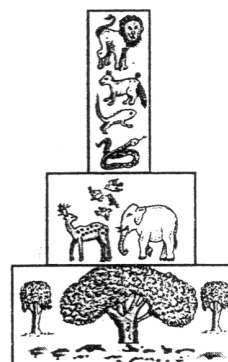
111. Identify the kind of pyramid represented by the given figure.

(A) Pyramid of numbers in a tree

(B) Pyramid of numbers in a parasitic food chain

(C) Pyramid of biomass in a forest ecosystem

(D) It is a wrong pyramid

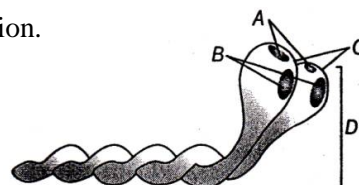


112. During the processing of proinsulin into the mature insulin

(A) C-peptide is added to proinsulin

(B) C-peptide is removed from proinsulin

- (C) B-peptide is added to proinsulin (D) B-peptide is removed from proinsulin
113. Polyembryony commonly occurs in  
(A) banana (B) tomato (C) potato (D) *citrus*.
114. The two benefits from apiculture are  
(A) honey (B) wax (C) flower formation (D) both (A) and (B)
115. Select the odd one regarding pisciculture.  
(A) Salmon (B) Pomfret (C) Lobster (D) Rohu
116. At which vertebra does trachea divide into right and left primary bronchi?  
(A) T5 (B) C5 (C) T9 (D) S4
117. If husband is Rh<sup>+</sup> and wife is Rh<sup>-</sup> then  
(A) no problem with first child irrespective of Rh  
(B) second child would have anaemia (erythroblastosis foetalis) if Rh<sup>+</sup>  
(C) second child would be normal in all cases  
(D) both (A) and (B)
118. Identify the true statements and choose the correct option accordingly.  
I. Blood vessel leading to the glomerulus is called efferent arteriole.  
II. Vasa-recta, peritubular capillaries and glomerulus, all have blood.  
III. Cortical nephrons have highly reduced vasa-recta.  
IV. Vasa-recta runs parallel to the Henle's loop in the juxta-medullary nephron.  
(A) I, II and III (B) I, III and IV  
(C) I, III and IV (D) II, III and IV
119. Identify A, B, C and D, in the given diagram and choose the correct option.  
(A) A-Actin binding site, B-ATP binding site, C-Head, D-Cross arm  
(B) A-Actin binding site B-ATP binding site, C-Head, D-Side arm  
(C) A-Actin binding site, B-ATP binding site, C-Head, D-Long arm  
(D) A-Actin binding site, B-ATP binding site, C-Head D-Short arm
120. The electrical potential difference across the plasma membrane when concentration of K is high inside axon and low outside axon is called as the  
(A) action potential (B) resting potential  
(C) refractory potential (D) All of (A), (B) and (C)
121. Match Column-I with Column-II and select the correct option from codes given below.



Column I		Column II	
a.	<i>Planaria</i>	(i)	Binary fission
b.	Fungi	(ii)	Asexual spores
c.	Yeast	(iii)	Budding
d.	<i>Amoeba</i>	(iv)	True regeneration
		(v)	Fragmentation

- (A) a - (i), b - (ii), c - (iii), d - (iv) (B) a - (iv), b - (ii), (v), c - (iii), d - (i)  
(C) a - (ii), b - (v), c - (i), d - (iv) (D) a - (v), b - (ii), (i), c - (iii), d - (iv)

122. Choose a statement which does not support reverse osmosis.
- (A) It is used for water purification.  
 (B) In this technique, pressure greater than osmotic pressure is applied to the system.  
 (C) It is a passive process.  
 (D) It is an active process.
123. Name elements which are required for chlorophyll synthesis.
- (A) Fe and Mg                      (B) Mo and Ca                      (C) Cu and Ca                      (D) Ca and K
124. Hormone responsible for ageing is
- (A) GA                      (B) IAA                      (C) ABA                      (D) cytokinin.
125. Name the disease which is caused by the bite of a female mosquito vector.
- (A) Filariasis                      (B) Amoebiasis                      (C) Typhoid                      (D) Pneumonia
126. The term “inbreeding depression” is related to
- (A) increased fertility and productivity                      (B) increased milk production  
 (C) decreased fertility and productivity                      (D) decreased diseases

127. Match the following columns.

Column I		Column II	
a.	Exon	1.	Coding sequence
b.	Intron	2.	Non-coding sequence
c.	Genetic code	3.	Triplet bases on mRNA
d.	DNA packaging	4.	Nucleosome

**Codes**

	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>
(A)	1	3	2	4
(B)	1	4	2	3
(C)	1	2	3	4
(D)	4	1	2	3

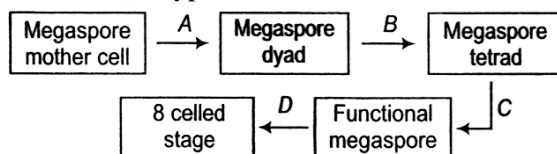
128. Classical example of point mutation is
- (A) colour blindness                      (B) night blindness  
 (C) sickle-cell anaemia                      (D) All of (A), (B) and (C)
129. In the process of insertional inactivation
- (A) a recombinant DNA is inserted within the coding sequence of enzyme  $\beta$ -galactosidase, resulting in inactivation of the enzyme  
 (B) a recombinant DNA is inserted within the coding sequence of proteins involved in the replication of the plasmid  
 (C) a recombinant DNA is inserted within the recognition site for EcoR I  
 (D) a nonrecombinant DNA is inserted within recognition site for BamH I
130. Name the step which should be performed by a person in order to visualize the bands of DNA fragments by using gel electrophoresis among the following
- (A) Exposure of DNA fragments to UV radiations

- (B) Staining with bromophenol blue followed by exposure to UV radiations  
 (C) Staining with ethidium bromide followed by exposure to UV radiations  
 (D) Person can see the bands without staining

131. Read the statements given below, select the one which is not a characteristic of pBR322 vector

- (A) It was the first artificial cloning vector constructed in 1977 by Boliver and Rodriguez  
 (B) It is the most widely used, versatile and easily manipulated vector  
 (C) It has two antibiotic resistance genes  $tet^R$  and  $amp^R$   
 (D) It does not have restriction site for Sal I

132. Give the name of type of the cell division at A, B, C and D.



- (A) A – Meiosis-I, B – Mitosis, C – Mitosis, D – Meiosis  
 (B) A – Meiosis-I, B – Meiosis-II, C – No division, D – Mitosis  
 (C) A – Mitosis, B – No division, C – Meiosis-II, D – Meiosis-I  
 (D) A – Mitosis, B – Mitosis, C – Meiosis-I, D – Meiosis-I

133. Apomictic embryos in citrus arise from

- (A) synergids  
 (B) maternal sporogenous tissue in ovule  
 (C) antipodal cell  
 (D) haploid egg

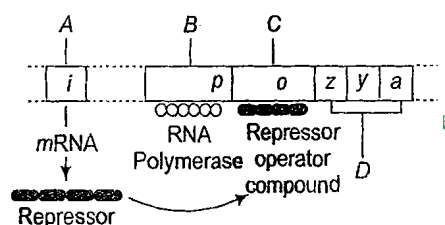
134. Match the column I (name of the organism) the column II (chromosome number in gamete) ( $n$ ) and choose the correct option.

Column I		Column II	
a.	<i>Ophioglossum</i>	(1)	23
b.	Rice	(2)	24
c.	Potato	(3)	12
d.	Man	(4)	630

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

135. Identify A, B, C and D.

- (A) A – Regulatory gene, B – Promoter, C – Operator,  
 D – Structural gene



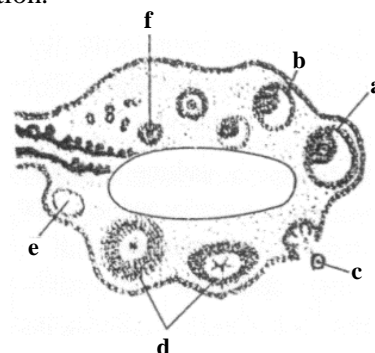


- (B) A – Regulatory gene, B – Promoter, C – Structural gene,  
D – Operator
- (C) A – Regulatory gene, B – Structural gene, C – Promoter,  
D – Operator
- (D) A – Regulatory gene, B – Structural gene, C – Operator gene,  
D – Promoter gene
136. Splicing is the removal of  
(A) exons (B) introns and joining of exons  
(C) exons and introns (D) exons and introns are joined
137. Genetically modified plants have been useful in increasing  
(A) crop yield (B) nutritional value of food  
(C) tolerance against abiotic stresses (D) all of (A), (B) and (C)
138. **Statement 1:** Test cross is used to determine an unknown genotype within one breeding generation.  
**Statement 2:** Test cross is a cross between F1 hybrid and dominant parent.  
(A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.  
(B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.  
(C) Statement 1 is correct and statement 2 is incorrect.  
(D) Both statements 1 and 2 are incorrect.
139. Possible blood groups of offspring when both parents have AB blood group is  
(A) AB only (B) A, B and AB (C) A, B, AB and O (D) A and B only
140. Phenotypic and genotypic ratio is similar in case of  
(A) complete dominance (B) incomplete dominance  
(C) over dominance (D) epistasis.
141. Name a 4-carbon compound among the following  
(A) Oxaloacetic acid (B) Phosphoglyceric acid  
(C) Ribulose biphosphate (D) Phosphoenol pyruvate
142. Ancient mammals enjoyed a release from competition when the dinosaurs became extinct. Should humans ensure that such releases from competition continue to occur for us or for other species?  
(A) No, because it is impossible to predict which species will become dominant if other species become extinct.  
(B) No, because the species that become dominant will cause the extinction of humans.  
(C) Yes, because the organisms that are released from competition will always form more new species than the number that went extinct.  
(D) Yes, because new species that evolve are always better organisms than those that went extinct.
143. The factors involved in the formation of new species are  
(A) isolation and gene flow (B) gene flow and competition  
(C) competition and cloning (D) isolation and variation.
144. Human female primary sex organ has  
(i) primary follicle (ii) graafian follicle (iii) blood vessel (iv) corpus luteum

- (A) (i) and (ii)                      (B) (ii), (iii) and (iv)                      (C) (iii) and (iv)                      (D) (i), (ii), (iii) and (iv)

145. In the given T.S. of human ovary identify a to f and select the correct option.

- (A) a - Secondary follicle, b - Tertiary follicle with antrum, c - Ovum,  
d - Corpus luteum, e - Primary follicle, f - Corpus albicans  
(B) a - Graafian follicle, b - Tertiary follicle with antrum, c - Ovum,  
d - Corpus spongiosum, e - Primary follicle, f - Corpus albicans  
(C) a - Graafian follicle, b - Tertiary follicle with antrum, c - Ovum,  
d - Corpus albicans, e - Primary follicle, f - Corpus luteum  
(D) a - Graafian follicle, b - Tertiary follicle with antrum, c - Ovum,  
d - Corpus luteum, e - Corpus albicans, f - Primary follicle



146. "When two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent of the other pair of characters". The statement explains which of the following laws/principles of Mendel?

- (A) Principle of paired factors                      (B) Principle of dominance  
(C) Law of segregation                      (D) Law of independent assortment

147. Fungi show sexual reproduction by all of the following processes except

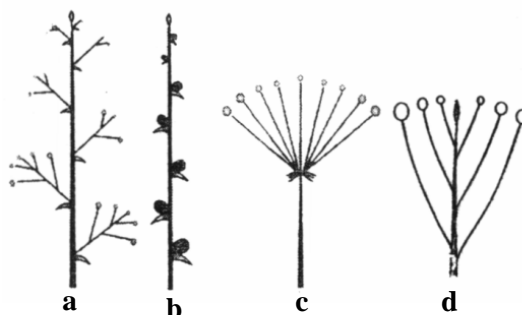
- (A) oospores                      (B) ascospores                      (C) basidiospores                      (D) zoospores

148. Major photosynthetic pigments in green algae are

- (A) Chl a and b                      (B) Chl a, c and fucoxanthin  
(C) Chl a, d and phycoerythrin                      (D) Chl a and c.

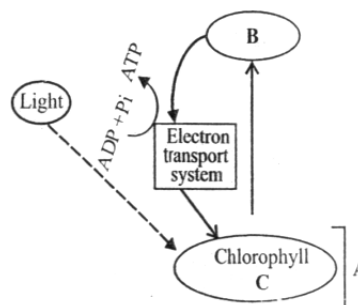
149. The given figure shows some types of inflorescences. Select the option that correctly identifies them.

	a	b	c	d
(A)	Panicle	Spike	Corymb	Catkin
(B)	Spike	Panicle	Corymb	Catkin
(C)	Panicle	Catkin	Umbel	Spike
(D)	Panicle	Spike	Umbel	Corymb



150. Study the given flow chart of cyclic photophosphorylation and select the correct answer for A, B and C.

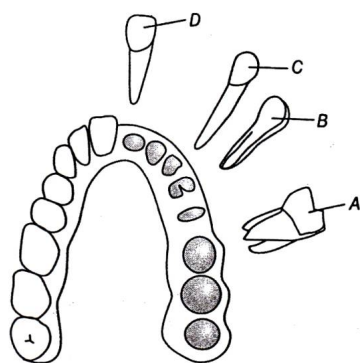
	A	B	C
(A)	PS I	$e^-$ acceptor Cytochrome	P680
(B)	PS I	$e^-$ acceptor	P700
(C)	PS II	Cytochrome	P700
(D)	PS II	Cytochrome	P680



151. IUDs prevent pregnancy by

- (A) inhibiting physiological and morphological uterine changes required for implantation

- (B) increasing phagocytosis of spermatozoa within uterus  
 (C) suppressing motility of sperms as well as their fertilizing capacity  
 (D) all of (A), (B) and (C)
152. Biological Oxygen Demand (BOD) is a measure of  
 (A) industrial wastes poured into water bodies  
 (B) extent to which water is polluted with organic compounds  
 (C) amount of carbon monoxide inseparably combined with haemoglobin  
 (D) amount of oxygen needed by green plants during night.
153. The Montreal Protocol refers to  
 (A) persistent organic pollutants  
 (B) global warming and climate change  
 (C) substances that deplete the ozone layer  
 (D) biosafety of genetically modified organisms
154. Minamata disease was caused due to the consumption of  
 (A) sea food containing lot of cadmium  
 (B) fish contaminated with mercury  
 (C) oysters with lot of pesticide  
 (D) sea food contaminated with selenium
155. When a bacteriophage, in its lytic phase, carries some of the partially digested bacterial chromosome with it to another host cell, the process is called  
 (A) generalised transpiration  
 (B) conjugation  
 (C) transformation  
 (D) specialised transduction
156. The biggest constraint of plant breeding is  
 (A) availability of desirable gene in the crop and its wild relatives  
 (B) infrastructure  
 (C) trained manpower  
 (D) transfer of genes from unrelated sources
157. Mycorrhiza does not help the host plant in  
 (A) enhancing its phosphorus uptake capacity  
 (B) increasing its tolerance to drought  
 (C) enhancing its resistance to root pathogens  
 (D) increasing its resistance to insects.
158. Fill in the blank with suitable option. \_\_\_\_\_ 'a' \_\_\_\_\_ produced by bacterium *Streptococcus* and modified by genetic engineering is used as a clot buster for removing clots from the blood vessels of patients who have undergone myocardial infarction leading to heart attack.  
 (A) Lipase  
 (B) Streptokinase  
 (C) Cyclosporin A  
 (D) Antibiotic streptomycin
159. The given schematic diagram depicts heterodont teeth and it's thecodont arrangement. Find the correct labelling for A-D from the options given below.



- (A) A-Incisor, B-Canine, C-Premolar, D-Molar      (B) A-Molar, B-Premolar, C-Canine, D-Incisor  
 (C) A-Incisors, B-Premolar, C-Canine, D-Molar      (D) A-Molar, B-Premolar, C-Incisor, D-Canine

160. The checkpoint in cell cycle plays important role in  
 (A) repairing DNA damage      (B) apoptosis inhibition  
 (C) assessing DNA damage      (D) inhibiting cell damage
161. Select the true statement regarding excretion in humans.  
 (A) Glucose and amino acids are reabsorbed in PCT by simple diffusion.  
 (B) DCT is impermeable to water.  
 (C) On an average, 25-30 gm of urea is excreted out per day.  
 (D) Maximum reabsorption occurs in the loop of Henle.
162. The H-zone in the skeletal muscle fibre is due to  
 (A) the central gap between actin filaments extending through myosin filaments in the A-band  
 (B) extension of myosin filaments in the central portion of the A-band  
 (C) the absence of myofibrils in the central portion of A-band  
 (D) the central gap between myosin filaments in the A-band.
163. The action of insulin is represented by  
 (A) increase in blood glucose level by stimulating glucagon production.  
 (B) decrease in blood glucose level by forming glycogen.  
 (C) increase in blood glucose level by promoting cellular uptake of glucose.  
 (D) increase in blood glucose level by hydrolysis of glycogen.
164. The source of somatostatin is same as that of  
 (A) thyroxine and calcitonin      (B) insulin and glucagon  
 (C) somatotropin and prolactin      (D) vasopressin and oxytocin
165. The plant part which consists of two generations, one within the other, is  
 (A) germinated pollen grain      (B) embryo  
 (C) unfertilised ovule      (D) seed
166. Select evidences which do not favour the Lamarckian concept of inheritance of acquired characters.  
 (A) Absence of limbs in snakes      (B) Melanization in peppered moth  
 (C) Presence of webbed toes in aquatic birds      (D) Lack of pigment in cave-dwelling animals
167. The relationship in an ecosystem can be depicted in  
 (A) pyramid of energy      (B) pyramid of biomass

(C) pyramid of numbers

(D) all of (A), (B) and (C)

168. Recent reports of acid rains in big industrial cities are due to the effect of atmospheric pollution by excessive release of

(A)  $\text{NH}_3$  by coal gas industries

(B)  $\text{NO}_2$  and  $\text{SO}_2$  by burning of fossil fuels

(C)  $\text{CO}_2$  by incomplete combustion of carbon fuel

(D)  $\text{CO}_2$  by burning of coal/wood, cutting of forests.

169. Both apical meristems and intercalary meristems are \_\_\_\_\_ meristems.

(A) primary

(B) secondary

(C) lateral

(D) both (B) and (C)

170. Read the following statements and select the correct ones.

(i) In simple cuboidal epithelium nuclei are rounded and lie in the centre of the cells.

(ii) Non-keratinized epithelium is highly impermeable to water.

(iii) Yellow elastic fibrocartilage makes cartilage flexible.

(iv) Areolar tissue forms a shock absorbing cushion around the eye balls and kidneys.

(A) (i) and (iii)

(B) (i) and (ii)

(C) (iii) and (iv)

(D) (ii) and (iv)

171. The type of ribosomes found in prokaryotes is

(A) 80S type

(B) 70S type

(C) 30S type

(D) 50S type.

172. The quaternary structure of proteins is due to

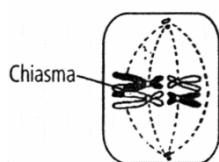
(A) formation of peptide bonds between amino acids

(B) coiling of one polypeptide chain

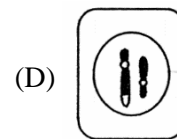
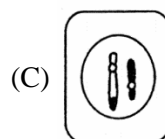
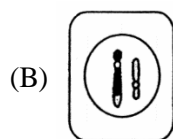
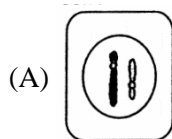
(C) folding of one coiled polypeptide chain

(D) linking together of two or more polypeptide chains.

173. Consider the given cell at metaphase-I stage undergoing normal meiosis.



Which of the following gametes will not be formed from this cell?



#### Assertion and Reason

(A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.

(B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion.

(C) If the assertion is true but the reason is false

(D) If both the assertion and reason are false

174. **Assertion:** Coconut tree is distributed in coastal areas over a large part of the world.

**Reason:** Coconut fruit can float and get dispersed over thousands of kilometers before losing viability.

175. **Assertion:** Presence of pneumatophores is a special adaptation of hydrophytes.  
**Reason:** Pneumatophores are positively geotropic shoots that have lenticels and help in gaseous exchange.
176. **Assertion:** Cartilage (protein matrix) and bone (calcium matrix) are rigid connective tissues.  
**Reason:** Blood is a connective tissue in which plasma is the matrix.
177. **Assertion:** In cells engaged in active secretion, as in pancreas, the rough endoplasmic reticulum is well developed.  
**Reason:** Ribosomes attached to endoplasmic reticulum are actively engaged in protein synthesis
178. **Assertion:** Many plants are propagated vegetatively even though they bear seeds.  
**Reason:** Potatoes multiply by tubers and apple by cutting.
179. **Assertion:** In some species of Asteraceae and poaceae seeds are formed without fertilisation.  
**Reason:** Formation of fruit without fertilisation is called parthenocarpy.
180. **Assertion:** Mammary glands are exocrine glands  
**Reason:** Mammary glands do not have ducts.

\* \* \*