

Time : 3 Hours

Max. Marks : 720

Important Instructions :

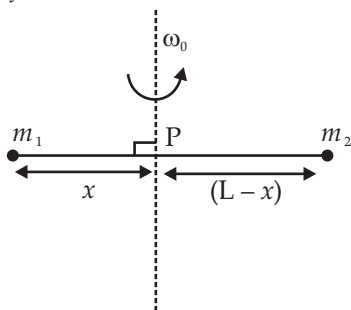
1. The test is of 3 hours duration and test contains 180 questions. Each question carries 4 marks. For each correct response, the candidate will get 4 marks.
2. For each incorrect response, one mark will be deducted from the total scores.

PHYSICS

1. The cylindrical tube of a spray pump has radius R , one end of which has n fine holes, each of radius r . If the speed of the liquid in the tube is v , the speed of the ejection of the liquid through the holes is

- (a) $\frac{vR^2}{n^2r^2}$ (b) $\frac{vR^2}{nr^2}$
 (c) $\frac{vR^2}{n^3r^2}$ (d) $\frac{v^2R}{nr}$

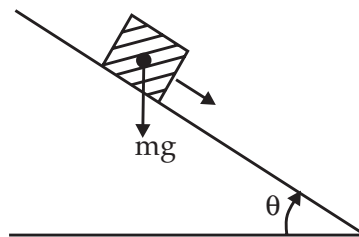
2. Point masses m_1 and m_2 are placed at the opposite ends of a rigid rod of length L and negligible mass. The rod is to be set rotating about an axis perpendicular to it. The position of point P on this rod through which the axis should pass, so that the work required to set the rod rotating with angular velocity ω_0 is minimum, is given by



- (a) $x = \frac{m_1L}{m_1 + m_2}$ (b) $x = \frac{m_1}{m_2}L$
 (c) $x = \frac{m_2}{m_1}L$ (d) $x = \frac{m_2L}{m_1 + m_2}$

3. A proton and an alpha particle both enter a region of uniform magnetic field B , moving at right angles to the field B . If the radius of circular orbits for both the particles is equal and the kinetic energy acquired by proton is 1 MeV, the energy acquired by the alpha particle will be
 (a) 4 MeV (b) 0.5 MeV (c) 1.5 MeV (d) 1 MeV

4. A plank with a box on it at one end is gradually raised about the other end. As the angle of inclination with the horizontal reaches 30° , the box starts to slip and slides 4.0 m down the plank in 4.0 s. The coefficients of static and kinetic friction between the box and the plank will be, respectively



- (a) 0.6 and 0.6 (b) 0.6 and 0.5
 (c) 0.5 and 0.6 (d) 0.4 and 0.3

5. An ideal gas is compressed to half its initial volume by means of several processes. Which of the process results in the maximum work done on the gas ?

- (a) Adiabatic (b) Isobaric
 (c) Isochoric (d) Isothermal

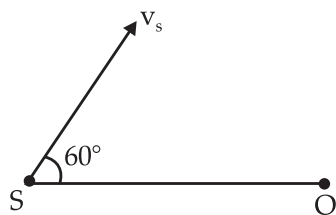
6. A ball is thrown vertically downwards from a height of 20 m with an initial velocity v_0 . It collides with the ground, loses 50% of its energy in collision and rebounds to the same height. The initial velocity v_0 is (Take, $g = 10 \text{ ms}^{-2}$)

- (a) 14 ms^{-1} (b) 20 ms^{-1}
 (c) 28 ms^{-1} (d) 10 ms^{-1}

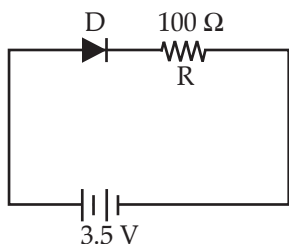
7. In the spectrum of hydrogen, the ratio of the longest wavelength in the Lyman series to the longest wavelength in the Balmer series is

- (a) $\frac{4}{9}$ (b) $\frac{9}{4}$ (c) $\frac{27}{5}$ (d) $\frac{5}{27}$

8. A source of sound S emitting waves of frequency 100 Hz and an observer O are located at some distance from each other. The source is moving with a speed of 19.4 ms^{-1} at an angle of 60° with the source observer line as shown in the figure. The observer is at rest. The apparent frequency observed by the observer (velocity of sound in air 330 ms^{-1}), is **Out of Syllabus**



- (a) 100 Hz (b) 103 Hz (c) 106 Hz (d) 97 Hz
9. If dimensions of critical velocity v_c of a liquid flowing through a tube are expressed as $[\eta^x \rho^y r^z]$, where η , ρ and r are the coefficient of viscosity of liquid, density of liquid and radius of the tube respectively, then the values of x , y and z are given by
- (a) 1, -1, -1 (b) -1, -1, 1
(c) -1, -1, -1 (d) 1, 1, 1
10. 4.0 g of gas occupies 22.4 L at NTP. The specific heat capacity of the gas at constant volume is $5.0 \text{ JK}^{-1} \text{ mol}^{-1}$. If the speed of sound in this gas at NTP is 952 ms^{-1} , then the heat capacity at constant pressure is (Take gas constant $R = 8.3 \text{ JK}^{-1} \text{ mol}^{-1}$)
- (a) $8.0 \text{ JK}^{-1} \text{ mol}^{-1}$ (b) $7.5 \text{ JK}^{-1} \text{ mol}^{-1}$
(c) $7.0 \text{ JK}^{-1} \text{ mol}^{-1}$ (d) $8.5 \text{ JK}^{-1} \text{ mol}^{-1}$
11. If vectors $\vec{A} = \cos \omega t \hat{i} + \sin \omega t \hat{j}$ and $\vec{B} = \cos \frac{\omega t}{2} \hat{i} + \sin \frac{\omega t}{2} \hat{j}$ are functions of time, then the value of t at which they are orthogonal to each other
- (a) $t = \frac{\pi}{4\omega}$ (b) $t = \frac{\pi}{2\omega}$
(c) $t = \frac{\pi}{\omega}$ (d) $t = 0$
12. In the given figure, a diode D is connected to an external resistance $R = 100 \Omega$ and an e.m.f of 3.5 V. If the barrier potential developed across the diode is 0.5 V, the current in the circuit will be

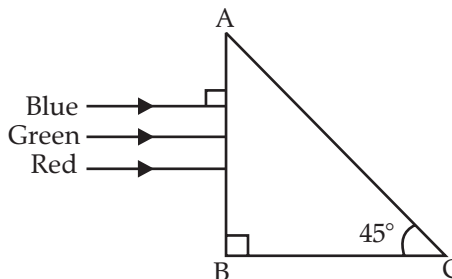


- (a) 30 mA (b) 40 mA
(c) 20 mA (d) 35 mA
13. If potential (in volts) in a region is expressed as $V(x, y, z) = 6xy - y + 2yz$, the electric field (in N/C) at point (1, 1, 0) is
- (a) $-(3\hat{i} + 5\hat{j} + 3\hat{k})$ (b) $-(6\hat{i} + 5\hat{j} + 2\hat{k})$
(c) $-(2\hat{i} + 3\hat{j} + \hat{k})$ (d) $-(6\hat{i} + 9\hat{j} + \hat{k})$
14. A remote sensing satellite of earth revolves in a circular orbit at a height of $0.25 \times 10^6 \text{ m}$ above the surface of earth. If earth's radius is $6.38 \times 10^6 \text{ m}$ and $g = 9.8 \text{ ms}^{-2}$, then the orbital speed of the satellite is

- (a) 7.76 kms^{-1} (b) 8.56 kms^{-1}
(c) 9.13 kms^{-1} (d) 6.67 kms^{-1}
15. Two metal wires of identical dimensions are connected in series. If σ_1 and σ_2 are the conductivities of the metal wires respectively, the effective conductivity of the combination is
- (a) $\frac{2\sigma_1\sigma_2}{\sigma_1 + \sigma_2}$ (b) $\frac{\sigma_1 + \sigma_2}{2\sigma_1\sigma_2}$
(c) $\frac{\sigma_1 + \sigma_2}{\sigma_1\sigma_2}$ (d) $\frac{\sigma_1\sigma_2}{\sigma_1 + \sigma_2}$
16. A satellite S is moving in an elliptical orbit around the earth. The mass of the satellite is very small as compared to the mass of the earth. Then,
- (a) the angular momentum of S about the centre of the earth changes in direction, but its magnitude remains constant.
(b) the total mechanical energy of S varies periodically with time.
(c) the linear momentum of S remains constant in magnitude.
(d) the acceleration of S is always directed towards the centre of the earth.
17. Two particles A and B, move with constant velocities \vec{v}_1 and \vec{v}_2 . At the initial moment, their position vectors are \vec{r}_1 and \vec{r}_2 respectively. The condition for particles A and B for their collision is
- (a) $\frac{\vec{r}_1 - \vec{r}_2}{|\vec{r}_1 - \vec{r}_2|} = \frac{\vec{v}_2 - \vec{v}_1}{|\vec{v}_2 - \vec{v}_1|}$ (b) $\vec{r}_1 \cdot \vec{r}_2 = \vec{v}_1 \cdot \vec{v}_2$
(c) $\vec{r}_1 \times \vec{v}_1 = \vec{r}_2 \times \vec{v}_2$ (d) $\vec{r}_1 - \vec{r}_2 = \vec{v}_1 \times \vec{v}_2$
18. Two stones of masses m and $2m$ are whirled in horizontal circles, the heavier one in a radius $\frac{r}{2}$ and the lighter one in radius r . The tangential speed of lighter stone is n times that of the value of heavier stone when they experience same centripetal forces. The value of n is
- (a) 2 (b) 3 (c) 4 (d) 1
19. A parallel plate air capacitor has capacity C , distance of separation between plates is d and potential difference V is applied between the plates. Force of attraction between the plates of the parallel plate air capacitor is
- (a) $\frac{C^2 V^2}{2d}$ (b) $\frac{CV^2}{2d}$ (c) $\frac{CV^2}{d}$ (d) $\frac{C^2 V^2}{2d^2}$
20. The position vector of a particle \vec{R} as a function of time is given by $\vec{R} = 4 \sin(2\pi t) \hat{i} + 4 \cos(2\pi t) \hat{j}$ where \vec{R} is in meter, t is in seconds and \hat{i} and \hat{j} denote unit vectors along x and y -directions, respectively. Which one of the following statements is wrong for the motion of particle?
- (a) Acceleration vector is along $-\vec{R}$.
(b) Magnitude of acceleration vector is $\frac{v^2}{R}$, where v is the velocity of particle.
(c) Magnitude of the velocity of particle is 8 m/s.

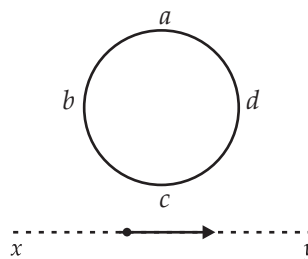
- (d) Path of the particle is a circle of radius 4 m.
21. A series R-C circuit is connected to an alternating voltage source. Consider two situations
1. When capacitor is air filled.
2. When capacitor is mica filled.
Current through resistor is i and voltage across capacitor is V then
(a) $V_a < V_b$ (b) $V_a > V_b$
(c) $i_a > i_b$ (d) $V_a = V_b$
22. A string is stretched between fixed points separated by 75.0 cm. It is observed to have resonant frequencies of 420 Hz and 315 Hz. There are no other resonant frequencies between these two. The lowest resonant frequency for this strings is
(a) 155 Hz (b) 205 Hz (c) 10.5 Hz (d) 105 Hz
23. The coefficient of performance of a refrigerator is 5. If the temperature inside freezer is -20°C , the temperature of the surroundings to which it rejects heat is
(a) 31°C (b) 41°C (c) 11°C (d) 21°C
24. A photoelectric surface is illuminated successively by monochromatic light of wavelength λ and $\frac{\lambda}{2}$. If the maximum kinetic energy of the emitted photoelectrons in the second case is 3 times that in the first case, the work function of the surface of the material is (h = Planck's constant, c = speed of light)
(a) $\frac{hc}{2\lambda}$ (b) $\frac{hc}{\lambda}$ (c) $\frac{2hc}{\lambda}$ (d) $\frac{hc}{3\lambda}$
25. In an astronomical telescope in normal adjustment a straight black line of length L is drawn on inside part of objective lens. The eye-piece forms a real image of this line. The length of this image is l . The magnification of the telescope is
(a) $\frac{L}{l} + 1$ (b) $\frac{L}{l} - 1$ (c) $\frac{L+1}{L-1}$ (d) $\frac{L}{l}$
26. Two slits in Youngs experiment have widths in the ratio 1 : 25. The ratio of intensity at the maxima and minima in the interference pattern $\frac{I_{\max}}{I_{\min}}$ is
(a) $\frac{9}{4}$ (b) $\frac{121}{49}$ (c) $\frac{49}{121}$ (d) $\frac{4}{9}$
27. Two vessels separately contain two ideal gases A and B at the same temperature, the pressure of A being twice that of B. Under such conditions, the density of A is found to be 1.5 times the density of B. The ratio of molecular weight of A and B is
(a) $\frac{2}{3}$ (b) $\frac{3}{4}$ (c) 2 (d) $\frac{1}{2}$
28. A circuit contains an ammeter, a battery of 30 V and a resistance $40.8\ \Omega$ all connected in series. If the ammeter has a coil of resistance $480\ \Omega$ and a shunt of $20\ \Omega$, then reading in the ammeter will be
(a) 0.5 A (b) 0.25 A (c) 2 A (d) 1 A
29. The value of coefficient of volume expansion of glycerin is $5 \times 10^{-4}\ \text{K}^{-1}$. The fractional change in the density of glycerin for a rise of 40°C in its temperature is

- (a) 0.015 (b) 0.020 (c) 0.025 (d) 0.010
30. The heart of a man pumps 5 L of blood through the arteries per minute at a pressure of 150 mm of mercury. If the density of mercury be $13.6 \times 10^3\ \text{kg/m}^3$ and $g = 10\ \text{m/s}^2$, then the power of heart in watt is
(a) 1.70 (b) 2.35 (c) 3.0 (d) 1.50
31. A beam of light consisting of red, green and blue colours is incident on a right angled prism. The refractive index of the material of the prism for the above red, green and blue wavelength are 1.39, 1.44 and 1.47, respectively.



The prism will

- (a) separate the blue colour part from the red and green colours.
(b) separate all the three colours from one another.
(c) not separate the three colours at all.
(d) separate the red colour part from the green and blue colours.
32. A rectangular coil of length 0.12 m and width 0.1 m having 50 turns of wire is suspended vertically in a uniform magnetic field of strength $0.2\ \text{Wb/m}^2$. The coil carries a current of 2 A. If the plane of the coil is inclined at an angle of 30° with the direction of the field, the torque required to keep the coil in stable equilibrium will be
(a) 0.15 Nm (b) 0.20 Nm
(c) 0.24 Nm (d) 0.12 Nm
33. An electron move on a straight line path XY as shown. The $abcd$ is a coil adjacent in the path of electron. What will be the direction of current, if any induced in the coil?

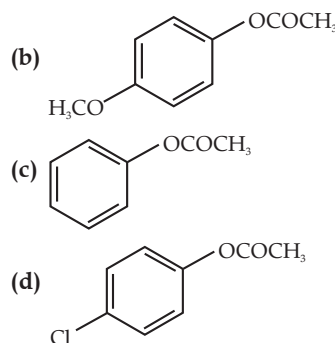
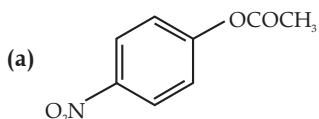


- (a) $abcd$
(b) $adcb$
(c) The current will reverse its direction as the electron goes past the coil.
(d) No current induced
34. A nucleus of uranium decays at rest into nuclei of thorium and helium. Then,
(a) the helium nucleus has more kinetic energy than the thorium nucleus.
(b) the helium nucleus has less momentum than the thorium nucleus.

- (c) the helium nucleus has more momentum than the thorium nucleus.
 (d) the helium nucleus has less kinetic energy than the thorium nucleus.
35. A force $\vec{F} = \alpha\hat{i} + 3\hat{j} + 6\hat{k}$ is acting at a point $\vec{r} = 2\hat{i} - 6\hat{j} - 12\hat{k}$. The value of α for which angular momentum about origin is conserved is
 (a) -1 (b) 2 (c) zero (d) 1
36. Water rises to a height 'h' in capillary tube. If the length of capillary tube above the surface of water is made less than 'h', then
 (a) water rises upto the tip of capillary tube and then starts overflowing like a fountain.
 (b) water rises upto the top of capillary tube and stays there without overflowing.
 (c) water rises upto a point a little below the top and stays there.
 (d) water does not rise at all.
37. A particle is executing a simple harmonic motion. Its maximum acceleration is α and maximum velocity is β . Then, its time period of vibration will be
 (a) $\frac{\beta^2}{\alpha^2}$ (b) $\frac{\alpha}{\beta}$ (c) $\frac{\beta^2}{\alpha}$ (d) $\frac{2\pi\beta}{\alpha}$
38. The energy of the EM waves is of the order of 15 K eV. To which part of the spectrum does it belong?
 (a) X-rays (b) Infrared rays
 (c) Ultraviolet rays (d) γ -rays
39. Light of wavelength 500 nm is incident on a metal with work function 2.28 eV. The de-Broglie wavelength of the emitted electron is
 (a) $< 2.8 \times 10^{-10}$ m (b) $< 2.8 \times 10^{-9}$ m
 (c) $\geq 2.8 \times 10^{-9}$ m (d) $\leq 2.8 \times 10^{-12}$ m
40. At the first minimum adjacent to the central maximum of a single slit diffraction pattern, the phase difference between the Huygen's wavelet from the edge of the slit and the wavelet from the midpoint of the slit is
 (a) $\frac{\pi}{4}$ radian (b) $\frac{\pi}{2}$ radian
 (c) π radian (d) $\frac{\pi}{8}$ radian
41. On a frictionless surface, a block of mass M moving at speed v collides elastically with another block of same mass M which is initially at rest. After collision the first block moves at an angle θ to its initial direction and has a speed $\frac{v}{3}$. The second block's speed after the collision is
 (a) $\frac{2\sqrt{2}}{3}v$ (b) $\frac{3}{4}v$ (c) $\frac{3}{\sqrt{2}}v$ (d) $\frac{\sqrt{3}}{2}v$
42. A potentiometer wire of length L and a resistance r are connected in series with a battery of e.m.f E_0 and a resistance r_1 . An unknown e.m.f E is balanced at a length l of the potentiometer wire. The e.m.f E will be given by Out of Syllabus
 (a) $\frac{LE_0r}{lr_1}$ (b) $\frac{E_0r}{(r+r_1)} \cdot \frac{l}{L}$
 (c) $\frac{E_0l}{L}$ (d) $\frac{LE_0r}{(r+r_1)l}$
43. The Young's modulus of steel is twice that of brass. Two wires of same length and of same area of cross-section, one of steel and another of brass are suspended from the same roof. If we want the lower ends of the wires to be at the same level, then the weights added to the steel and brass wires must be in the ratio of
 (a) 1 : 2 (b) 2 : 1 (c) 4 : 1 (d) 1 : 1
44. The input signal given to a CE amplifier having a voltage gain of 150 is $V_i = 2 \cos\left(15t + \frac{\pi}{3}\right)$. The corresponding output signal will be Out of Syllabus
 (a) $300 \cos\left(15t + \frac{\pi}{3}\right)$ (b) $75 \cos\left(15t + \frac{2\pi}{3}\right)$
 (c) $2 \cos\left(15t + \frac{5\pi}{3}\right)$ (d) $300 \cos\left(15t + \frac{4\pi}{3}\right)$
45. An automobile moves on a road with a speed of 54 km h^{-1} . The radius of its wheels is 0.45 m and the moment of inertia of the wheel about its axis of rotation is 3 kg m^2 . If the vehicle is brought to rest in 15 s, the magnitude of average torque transmitted by its brakes to the wheel is
 (a) 6.66 kg $m^2 s^{-2}$ (b) 8.58 kg $m^2 s^{-2}$
 (c) 10.86 kg $m^2 s^{-2}$ (d) 2.86 kg $m^2 s^{-2}$

CHEMISTRY

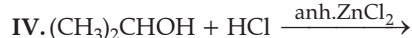
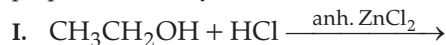
46. In which of the following pairs, both the species are not isostructural?
 (a) $SiCl_4, PCl_4^+$ (b) Diamond, carbide
 (c) NH_3, PH_3 (d) XeF_4, XeO_4
47. Which one of the following esters gets hydrolysed most easily under alkaline conditions?



48. Reaction of phenol with chloroform in the presence of dilute sodium hydroxide finally introduces which one of the following functional group ?

(a) $-\text{CH}_2\text{Cl}$ (b) $-\text{COOH}$
(c) $-\text{CHCl}_2$ (d) $-\text{CHO}$

49. Which of the following reaction(s) can be used for the preparation of alkyl halides ?

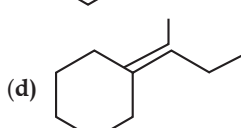
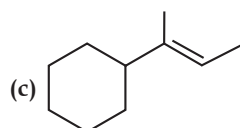
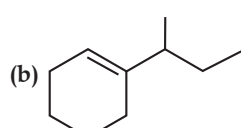
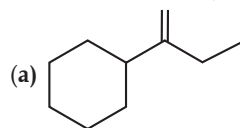
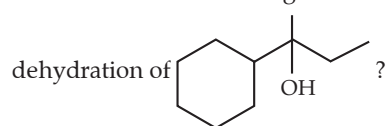


(a) I, III and IV (b) I and II
(c) Only IV (d) III and IV

50. In an $\text{S}_{\text{N}}1$ reaction on chiral centres there is

(a) 100% racemisation.
(b) inversion more than retention leading to partial racemisation.
(c) 100% retention.
(d) 100% inversion.

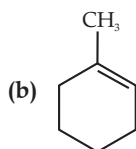
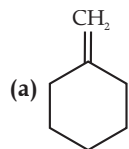
51. Which of the following is not the product of



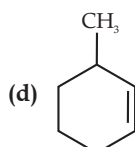
52. On heating which of the following releases CO_2 most easily ?

(a) K_2CO_3 (b) Na_2CO_3
(c) MgCO_3 (d) CaCO_3

53. In the reaction with HCl , an alkene reacts in accordance with the Markovnikoff's rule, to give a product 1-chloro-1-methyl-cyclohexane. The possible alkane/es is/are



(c) (a) and (b)



54. Number of possible isomers for the complex $[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$ will be (en = ethylenediamine)

(a) 2 (b) 1 (c) 3 (d) 4

55. A gas such as carbon monoxide would be most likely to obey the ideal gas law at

(a) high temperatures and low pressures.
(b) low temperatures and high pressures.
(c) high temperatures and high pressures.
(d) low temperatures and low pressures.

56. If Avogadro number N_A , is changed from $6.022 \times 10^{23} \text{ mol}^{-1}$ to $6.022 \times 10^{20} \text{ mol}^{-1}$ this would change

(a) the definition of mass in units of grams.
(b) the mass of one mole of carbon.
(c) the ratio of chemical species to each other in a balanced equation.
(d) the ratio of elements to each other in a compound.

57. Gadolinium belongs to $4f$ series. It's atomic number is 64. Which of the following is the correct electronic configuration of gadolinium ?

(a) $[\text{Xe}]4f^66d^2$ (b) $[\text{Xe}]4f^95s^{-1}$
(c) $[\text{Xe}]4f^75d^16s^2$ (d) $[\text{Xe}]4f^65d^26s^2$

58. What is the pH of the resulting solution when equal volumes of 0.1 M NaOH and 0.01 M HCl are mixed ?

(a) 12.65 (b) 2.0 (c) 7.0 (d) 1.04

59. Decreasing order of stability of O_2 , O_2^- , O_2^+ and O_2^{2-} is

(a) $\text{O}_2^+ > \text{O}_2 > \text{O}_2^- > \text{O}_2^{2-}$

(b) $\text{O}_2^{2-} > \text{O}_2^- > \text{O}_2 > \text{O}_2^+$

(c) $\text{O}_2 > \text{O}_2^+ > \text{O}_2^{2-} > \text{O}_2^-$

(d) $\text{O}_2^- > \text{O}_2^{2-} > \text{O}_2^+ > \text{O}_2$

60. The correct statement regarding defects in the crystalline solid is

Out of Syllabus

(a) Schottky defects have no effect on the density of crystalline solids.

(b) Frenkel defects decreases the density of crystalline solids.

(c) Frenkel defect is a dislocation defect.

(d) Frenkel defect is found in halides of alkaline metals.

61. Which of the following statements is not correct for a nucleophile ?

(a) Nucleophile is a Lewis acid.

(b) Ammonia is a nucleophile.

(c) Nucleophiles attack low electron density sites.

(d) Nucleophiles are not electron seeking.

62. The hybridisation involved in complex $[\text{Ni}(\text{CN})_4]^{2-}$ is (Atomic number of Ni = 28)

(a) dsp^2 (b) sp^3 (c) d^2sp^2 (d) d^2sp^3

63. The stability of +1 oxidation state among Al, Ga, In and Tl increases in the sequence

(a) $\text{Ga} < \text{In} < \text{Al} < \text{Tl}$ (b) $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$

(c) $\text{Tl} < \text{In} < \text{Ga} < \text{Al}$ (d) $\text{In} < \text{Tl} < \text{Ga} < \text{Al}$

64. The sum of coordination number and oxidation number of the metal M in the complex $[\text{M}(\text{en})_2(\text{C}_2\text{O}_4)]\text{Cl}$ (where, en is ethylenediamine) is

(a) 9 (b) 6 (c) 7 (d) 8

65. Which of the statements given below is incorrect ?

(a) Cl_2O_7 is an anhydride of perchloric acid.

(b) O_3 molecule is bent.

(c) ONF is isoelectronic with NO_2 .

(d) OF_2 is an oxide of fluorine.

66. In the extraction of copper from its sulphide ore, the metal finally obtained by the reduction of cuprous oxide with

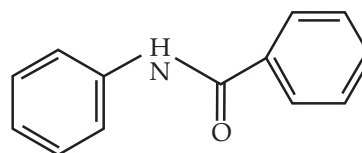
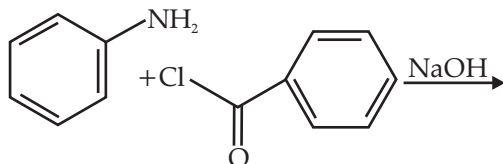
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- (a) iron (II) sulphide (b) carbon monoxide
(c) copper (I) sulphide (d) sulphur dioxide
67. Which one of the following pairs of solution is not an acidic buffer ?
(a) HClO_4 and NaClO_4
(b) CH_3COOH and CH_3COONa
(c) H_2CO_3 and Na_2CO_3
(d) H_3PO_4 and Na_3PO_4
68. Assuming complete ionisation, same moles of which of the following compounds will require the least amount of acidified KMnO_4 for complete oxidation?
(a) FeSO_4 (b) FeSO_3
(c) FeC_2O_4 (d) $\text{Fe}(\text{NO}_2)_2$
69. The number of structural isomers possible from the molecular formula $\text{C}_3\text{H}_9\text{N}$ is
(a) 4 (b) 5 (c) 2 (d) 3
70. 20.0 g of a magnesium carbonate sample decomposes on heating to give carbon dioxide and 8.0 g magnesium oxide. What will be the percentage purity of magnesium carbonate in the sample ? (Atomic weight of Mg = 24)
(a) 75 (b) 96 (c) 60 (d) 84
71. Two possible stereo-structures of $\text{CH}_3\text{CHOH.COOH}$, which are optically active, are called
(a) diastereomers. (b) atropisomers.
(c) enantiomers. (d) mesomers.
72. The heat of combustion of carbon to CO_2 is -393.5 kJ/mol . The heat released upon the formation of 35.2 g of CO_2 from carbon and oxygen gas is
(a) -315 kJ (b) $+315 \text{ kJ}$ (c) -630 kJ (d) -3.15 kJ
73. The rate constant of the reaction $\text{A} \rightarrow \text{B}$ is 0.6×10^{-3} mole per second. If the concentration of A is 5 M then concentration of B after 20 min is
(a) 1.08 M (b) 3.60 M (c) 0.36 M (d) 0.72 M
74. The formation of the oxide ion $\text{O}^{2-}(\text{g})$, from oxygen atom requires first an exothermic and then an endothermic step as shown below,
 $\text{O}(\text{g}) + \text{e}^- \rightarrow \text{O}^-(\text{g}); \quad \Delta_f H^\circ = -141 \text{ kJ mol}^{-1}$
 $\text{O}^-(\text{g}) + \text{e}^- \rightarrow \text{O}^{2-}(\text{g}); \quad \Delta_f H^\circ = +780 \text{ kJ mol}^{-1}$
Thus, process of formation of O^{2-} in gas phase is unfavourable even though O^{2-} is isoelectronic with neon. It is due to the fact that
(a) electron repulsion outweighs the stability gained by achieving noble gas configuration.
(b) O^- ion has comparatively smaller size than oxygen atom.
(c) oxygen is more electronegative.
(d) addition of electron in oxygen results in large size of the ion.
75. What is the mass of precipitate formed when 50 mL of 16.9% solution of AgNO_3 is mixed with 60 mL of 5.8% NaCl solution ?
(Ag = 107.8, N = 14, O = 16, Na = 23, Cl = 35.5)
(a) 28 g (b) 3.5 g (c) 7 g (d) 14 g
76. Which is the correct order of increasing energy of the listed orbitals in the atom of titanium ?
(a) $3s \ 4s \ 3p \ 3d$ (b) $4s \ 3s \ 3p \ 3d$
(c) $3s \ 3p \ 3d \ 4s$ (d) $3s \ 3p \ 4s \ 3d$
77. Reaction of a carbonyl compound with one of the following reagents involves nucleophilic addition followed by the elimination of water. The reagent is
(a) a Grignard reagent.
(b) hydrazine in presence of feebly acidic solution.
(c) hydrocyanic acid.
(d) sodium hydrogen sulphite.
78. The variation of the boiling point of the hydrogen halides is in the order $\text{HF} > \text{HI} > \text{HBr} > \text{HCl}$. What explains the higher boiling point of hydrogen fluoride ?
(a) The electronegativity of fluorine is much higher than for other elements in the group.
(b) There is strong hydrogen bonding between HF molecules.
(c) The bond energy of HF molecules is greater than other hydrogen halides.
(d) The effect of nuclear shielding is much reduced in fluorine which polarises the HF molecule.
79. The name of complex ion, $[\text{Fe}(\text{CN})_6]^{3-}$ is
(a) hexacyanoiron (III) ion.
(b) hexacyanoferrate (III) ion.
(c) tricyanoferrate (III) ion.
(d) hexacyanidoferrate (III) ion.
80. Method by which aniline cannot be prepared is
(a) hydrolysis phenyl isocyanide with acidic solution.
(b) degradation of benzamide with bromine in alkaline solution.
(c) reduction of nitrobenzene with H_2/Pd in ethanol.
(d) potassium salt of phthalimide treated with chlorobenzene followed by the hydrolysis with aqueous NaOH solution.
81. If the equilibrium constant for
 $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$ is K, the equilibrium constant for $\frac{1}{2} \text{N}_2(\text{g}) + \frac{1}{2} \text{O}_2(\text{g}) \rightleftharpoons \text{NO}(\text{g})$ will be
(a) $\frac{1}{K^2}$ (b) $\frac{1}{2} K$ (c) K (d) K^2
82. Strong reducing behaviour of H_3PO_2 is due to
(a) presence of one $-\text{OH}$ group and two $\text{P}-\text{H}$ bonds.
(b) high electron gain enthalpy of phosphorus.
(c) high oxidation state of phosphorus.
(d) presence of two $-\text{OH}$ groups and one $\text{P}-\text{H}$ bond.
83. 2, 3-dimethyl-2-butene can be prepared by heating which of the following compounds with a strong acid ?
(a) $(\text{CH}_3)_2\text{CH}-\text{CH}=\text{CH}_2$
 $\quad \quad \quad |$
 $\quad \quad \quad \text{CH}_3$
(b) $(\text{CH}_3)_3\text{C}-\text{CH}=\text{CH}_2$
(c) $(\text{CH}_3)_2\text{C}=\text{CH}-\text{CH}=\text{CH}_2$
(d) $(\text{CH}_3)_2\text{CH}-\text{CH}_2-\text{CH}=\text{CH}_2$
84. Aqueous solution of which of the following compounds is the best conductor of electric current ?
(a) Acetic acid, $\text{C}_2\text{H}_4\text{O}_2$
(b) Hydrochloric acid, HCl
(c) Ammonia, NH_3
(d) Fructose, $\text{C}_6\text{H}_{12}\text{O}_6$
85. The vacant space in bcc lattice cell is Out of Syllabus
(a) 26% (b) 48% (c) 23% (d) 32%
86. What is the mole fraction of the solute in a 1.00 m aqueous solution ?
(a) 0.177 (b) 1.770 (c) 0.0354 (d) 0.0177

87. The oxidation of benzene by V_2O_5 in the presence of air produces
 (a) benzoic anhydride. (b) maleic anhydride.
 (c) benzoic acid. (d) benzaldehyde.
88. Caprolactum is used for the manufacture of

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- (a) nylon-6 (b) teflon
 (c) terylene (d) nylon-6, 6
89. The following reaction,



is known by the name

- (a) Friedel-Crafts reaction.
 (b) Perkins reaction.
 (c) Acetylation reaction.
 (d) Schotten-Baumann reaction.
90. The number of water molecules is maximum in
 (a) 18 molecules of water. (b) 1.8 g of water.
 (c) 18 g of water. (d) 18 moles of water.

BIOLOGY

91. Read the different components from I to IV in the list given below and tell the correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem

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- I. Secondary cortex
 II. Wood
 III. Secondary phloem
 IV. Phellem

The correct order is

- (a) III, IV, II, I (b) I, II, IV, III
 (c) IV, I, III, II (d) IV, III, I, II
92. Chromatophores take part in
 (a) photosynthesis. (b) growth.
 (c) movement. (d) respiration.
93. Which of the following joints would allow no movement?
 (a) Fibrous joint (b) Cartilaginous joint
 (c) Synovial joint (d) Ball and socket joint
94. The wheat grain has an embryo with one large, shield-shaped cotyledon known as
- (a) epiblast. (b) coleorrhiza.
 (c) scutellum. (d) coleoptile.
95. A gene showing co-dominance has
 (a) one allele dominant on the other.
 (b) alleles tightly linked on the same chromosome.
 (c) alleles that are recessive to each other.
 (d) both alleles independently expressed in the heterozygote.
96. Which of the following structure is not found in a prokaryotic cell?
 (a) Nuclear envelope (b) Ribosome
 (c) Mesosome (d) Plasma membrane
97. The term "linkage" was coined by
 (a) TH Morgan (b) T Boveri
 (c) G Mendel (d) W Sutton
98. The imperfect fungi which are decomposers of litter and help in mineral cycling belongs to
 (a) Deuteromycetes (b) Basidiomycetes
 (c) Phycomycetes (d) Ascomycetes
99. Match of the columns and identify the correct option.

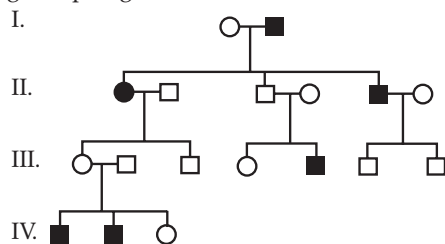
Column I		Column II	
A.	Thylakoids	1.	Disc-shaped sacs in Golgi apparatus
B.	Cristae	2.	Condensed structure of DNA
C.	Cisternae	3.	Flat membranous sacs in stroma
D.	Chromatin	4.	Infoldings in mitochondria

Codes

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 4 | 3 | 1 | 2 |
| (b) | 3 | 4 | 1 | 2 |
| (c) | 3 | 1 | 4 | 2 |
| (d) | 3 | 4 | 2 | 1 |
100. Select the wrong statement.
 (a) The viroids were discovered by DJ Ivanowski.
 (b) WM Stanely showed that viruses could be crystallised.
 (c) The term '*contagium vivum fluidum*' was coined by MW Beijerinck.
 (d) Mosaic disease in tobacco and AIDS in human being is caused by viruses.
101. During biological nitrogen fixation, inactivation of nitrogenase by oxygen poisoning is prevented by
 (a) leghaemoglobin. (b) xanthophyll.
 (c) carotene. (d) cytochrome.
102. The species confined to a particular region and not found elsewhere is termed as
 (a) keystone. (b) alien.
 (c) endemic. (d) rare.
103. Which one of the following hormones is not involved in sugar metabolism?
 (a) Cortisone (b) Aldosterone
 (c) Insulin (d) Glucagon
104. Which of the following is not a function of the skeletal system?
 (a) Production of erythrocytes.
 (b) Storage of minerals.
 (c) Production of body heat.
 (d) Locomotion.

105. Which one of the following is not applicable to RNA ?
 (a) Complementary base pairing.
 (b) 5' phosphoryl and 3' hydroxyl ends.
 (c) Heterocyclic nitrogenous bases.
 (d) Chargaff's rule.
106. Which one is a wrong statement ?
 (a) *Archegonia* are found in Bryophyta, Pteridophyta and Gymnosperms.
 (b) *Mucor* has biflagellate zoospores.
 (c) Haploid endosperm is a typical feature of gymnosperms.
 (d) Brown algae have chlorophyll-*a* and *c*, and fucoxanthin.
107. A childless couple can be assisted to have a child through a technique called GIFT. The full form of this technique is
 (a) Gamete Inseminated Fallopian Transfer.
 (b) Gamete Intra Fallopian Transfer.
 (c) Gamete Internal Fertilisation and Trans-fer.
 (d) Germ Cell Internal Fallopian Transfer.
108. The wings of a bird and the wings of an insect are
 (a) homologous structures and represent divergent evolution.
 (b) analogous structures and represent convergent evolution.
 (c) phylogenetic structures and represent divergent evolution.
 (d) homologous structures and represent convergent evolution.
109. Golden rice is a genetically modified crop plant where the incorporated gene is meant for biosynthesis of
 (a) vitamin-B. (b) vitamin-C.
 (c) omega 3. (d) vitamin-A.
110. Outbreeding is an important strategy of animal husbandry because it
 (a) help in accumulation of superior genes.
 (b) is useful in producing purelines of animals.
 (c) is useful in overcoming inbreeding depression.
 (d) exposes harmful recessive genes that are eliminated by selection.
111. Which one of the following hormones though synthesised elsewhere, is stored and released by the master gland ?
 (a) Antidiuretic hormone.
 (b) Luteinizing hormone.
 (c) Prolactin.
 (d) Melanocyte stimulating hormone.
112. An association of individuals of different species living in the same habitat and having functional interaction is
 (a) ecological niche. (b) biotic community.
 (c) ecosystem. (d) population.
113. Which of the following both pairs have correct combination ?
 (a) Gaseous nutrient cycle Carbon and nitrogen
 Sedimentary nutrient cycle Sulphur and phosphorus
 (b) Gaseous nutrient cycle Carbon and Sulphur
 Sedimentary nutrient cycle Nitrogen and phosphorus
 (c) Gaseous nutrient cycle Nitrogen and sulphur
 Sedimentary nutrient cycle Carbon and phosphorus
 (d) Gaseous nutrient cycle Sulphur and phosphorus
 Sedimentary nutrient cycle Carbon and nitrogen
114. Identify the correct order of organisation of genetic material from largest to smallest.
 (a) Chromosome, gene, genome, nucleotide
 (b) Genome, chromosome, nucleotide, gene
 (c) Genome, chromosome, gene, nucleotide
 (d) Chromosome, genome, nucleotide, gene
115. A jawless fish, which lays eggs in fresh water and whose ammocoetes larvae after metamorphosis return to the ocean is
 (a) *Eptatretus*. (b) *Myxine*.
 (c) *Neomyxine*. (d) *Petromyzon*.
116. Industrial melanism is an example of
 (a) Neo Darwinism. (b) Natural selection.
 (c) Mutation. (d) Neo Lamarckism.
117. Cell wall is absent in
 (a) *Aspergillus*. (b) *Funaria*.
 (c) *Mycoplasma*. (d) *Nostoc*.
118. The chitinous exoskeleton of arthropods is formed by the polymerisation of
 (a) keratin sulphate and chondroitin sulphate.
 (b) D-glucosamine.
 (c) N-acetyl glucosamine.
 (d) lipoglycans.
119. Filiform apparatus is the characteristic feature of
 (a) generative cell. (b) nucellar embryo.
 (c) aleurone cell. (d) synergids.
120. In angiosperms, microsporogenesis and megasporogenesis
 (a) occur in anther.
 (b) form gametes without further divisions.
 (c) involve meiosis.
 (d) occur in ovule.
121. Metagenesis refers to
 (a) the presence of different morphic forms.
 (b) alternation of generation between asexual and sexual phases of an organism.
 (c) occurrence of a drastic change in form during post-embryonic development.
 (d) the presence of a segmented body and parthenogenetic mode of reproduction.
122. Which of the following immunoglobulins does constitute the largest percentage in human milk ?
 (a) IgD (b) IgM (c) IgA (d) IgG
123. Destruction of the anterior horn cells of the spinal cord would result in the loss of
 (a) sensory impulses.
 (b) voluntary motor impulses.
 (c) commissural impulses.
 (d) integrating impulses.
124. The cutting of DNA at specific locations became possible with the discovery of
 (a) restriction enzymes. (b) probes.
 (c) selectable markers. (d) ligases.

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



- (a) Autosomal dominant. (b) X-linked recessive.
(c) Autosomal recessive. (d) X-linked dominant.
126. A colour blind man marries a woman with normal sight who has no history of colour blindness in her family. What is the probability of their grandson being colour blind ?
(a) 0.5 (b) 1 (c) Nil (d) 0.25
127. Flowers are unisexual in
(a) pea. (b) cucumber.
(c) china rose. (d) onion.
128. Roots play insignificant role in absorption of water in
(a) sunflower. (b) *Pistia*.
(c) pea. (d) wheat.
129. Balbiani rings are sites of
(a) lipid synthesis.
(b) nucleotide synthesis.
(c) polysaccharide synthesis.
(d) RNA and protein synthesis.
130. Which of the following pairs is not correctly match?
- | Mode of reproduction | Example |
|----------------------|--------------------|
| (a) Offset | Water hyacinth |
| (b) Rhizome | Banana |
| (c) Binary fission | <i>Sargassum</i> |
| (d) Conidia | <i>Penicillium</i> |
131. Ectopic pregnancies are referred to as
(a) pregnancies with genetic abnormality.
(b) implantation of embryo at site other than uterus.
(c) implantation of defective embryo in the uterus.
(d) pregnancies terminated due to the hormonal imbalance.
132. Choose the wrong statement.
(a) *Penicillium* is multicellular and produces antibiotics.
(b) *Neurospora* is used in the study of biochemical genetics.
(c) Morels and truffles are poisonous mushrooms.
(d) Yeast is unicellular and useful in fermentation.
133. The function of the gap junction is to
(a) Perform cementing to keep neighbouring cells together.
(b) facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules.
(c) separate two cells from each other.
(d) stop substance from leaking across a tissue.
134. Axile placentation is present in
(a) dianthus. (b) lemon.
(c) pea. (d) *Argemone*.

135. Which of the following are not membrane bound ?
(a) Vacuoles (b) Ribosomes
(c) Lysosomes (d) Mesosomes
136. In his classic experiments on pea plants, Mendel did not use
(a) seed colour. (b) pod length.
(c) seed shape. (d) flower position.
137. During ecological succession
(a) the gradual and predictable change in species composition occurs in a given area.
(b) the establishment of a new biotic community is very fast in its primary phase.
(c) the numbers and types of animals remain constant.
(d) the changes lead to a community that is near equilibrium with the environment and is called pioneer community.
138. The body cells in cockroach discharge their nitrogenous waste in the haemolymph mainly in the form of
(a) ammonia. (b) potassium urate.
(c) urea. (d) calcium carbonate.
139. Which of the following biomolecules does have a phosphodiester bond ?
(a) Fatty acids in a diglyceride.
(b) Monosaccharides in a polysaccharide.
(c) Amino acids in a polypeptide.
(d) Nucleic acids in a nucleotide.
140. The UN conference of Parties on climate change in the year 2012 was held at
(a) Durban. (b) Doha. (c) Lima. (d) Warsaw.
141. Arrange the following events of meiosis in correct sequences
I. Crossing over
II. Synapsis
III. Terminalisation of chiasmata
IV. Disappearance of nucleolus
(a) II, I, IV, III (b) II, I, III, IV
(c) I, II, III, IV (d) II, III, IV, I
142. Root pressure develops due to
(a) active absorption.
(b) low osmotic potential in soil.
(c) passive absorption.
(d) increase in transpiration.
143. Which one of the following animals has two separate circulatory pathways ?
(a) Frog (b) Lizard (c) Whale (d) Shark
144. Which of the following events is not associated with ovulation in human female ?
(a) Decrease in estradiol
(b) Full development of Graafian follicle
(c) Release of secondary oocyte
(d) LH surge
145. Most animals that live in deep oceanic water are
(a) primary consumers.
(b) secondary consumers.
(c) tertiary consumers.
(d) detritivores.
146. If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidence ?
(a) Fibrinogen in plasma (b) Serum albumins
(c) Haemocytes (d) Serum globulins

147. The structures that help some bacteria to attach to rocks and/or host tissues are
 (a) rhizoids. (b) fimbriae.
 (c) mesosomes. (d) holdfast.
148. Increase in concentration of the toxicant at successive trophic levels is known as
 (a) biomagnification. (b) biodeterioration.
 (c) biotransformation. (d) biogeochemical cycling.
149. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum
 (a) coelenterata. (b) porifera.
 (c) mollusca. (d) protozoa.
150. The oxygen evolved during photosynthesis comes from water molecules. Which one of the following pairs of elements involved in this reaction ?
 (a) Manganese and chlorine.
 (b) Manganese and potassium.
 (c) Magnesium and molybdenum.
 (d) Magnesium and chlorine.
151. The primary dentition in human differs from permanent dentition in not having one of the following type of teeth
 (a) canine. (b) premolars.
 (c) molars. (d) incisors.
152. Coconut water from a tender coconut is
 (a) immature embryo.
 (b) free nuclear endosperm.
 (c) innermost layers of the seed coat.
 (d) degenerated nucellus.
153. Which of the following layers in an antral follicle is acellular ?
 (a) Granulosa (b) Theca internal
 (c) Stroma (d) Zona pellucida
154. The introduction of tDNA into plants involves
 (a) infection of the plant by *Agrobacterium tumefaciens*.
 (b) altering the pH of soil, heat-shocking the plants.
 (c) exposing the plants to cold for a brief period.
 (d) allowing the plant roots to stand in water.
155. In which group of organisms the cell walls form two thin overlapping shells which fit together ?
 (a) Chrysophytes (b) Euglenoids
 (c) Dinoflagellates (d) Slime moulds
156. Human urine is usually acidic because
 (a) the sodium transporter exchanges one hydrogen ion for each sodium ion, in peritubular capillaries.
 (b) excreted plasma proteins are acidic.
 (c) potassium and sodium exchange generates acidity.
 (d) hydrogen ions are actively secreted into the filtrate.
157. In photosynthesis, the light-independent reactions takes place at
 (a) thylakoid lumen. (b) photosystem I.
 (c) photosystem II. (d) stromal matrix.
158. In mammalian eye, the 'fovea' is the center of the visual field, where
 (a) high density of cones occur, but has no rods.
 (b) the optic nerve leaves the eye.
 (c) only rods are present.
 (d) more rods than cones are found.
159. The DNA molecule to which the gene of interest is integrated for cloning is called
 (a) transformer. (b) vector.
 (c) template. (d) carrier.
160. Pick up the wrong statement.
 (a) Cell wall is absent in Animalia.
 (b) Protista have photosynthetic and hetero-trophic modes of nutrition.
 (c) Some fungi are edible.
 (d) Nuclear membrane is present in Monera.
161. Among China rose, mustard, brinjal, potato, guava, cucumber, onion and tulip, how many plants have superior ovary ?
 (a) Five (b) Six (c) Three (d) Four
162. Name the pulmonary disease in which alveolar surface area involved in gaseous exchange is drastically reduced due to damage in the alveolar walls.
 (a) Pleurisy (b) Emphysema
 (c) Pneumonia (d) Asthma
163. A column of water within xylem vessels of tall trees does not break under its weight because of
 (a) dissolved sugars in water.
 (b) tensile strength of water.
 (c) lignification of xylem vessels.
 (d) positive root pressure.
164. Acid rain is caused by increase in the atmospheric concentration of
 (a) SO_2 and NO_2 (b) SO_3 and CO
 (c) CO_2 and CO (d) O_3 and dust
165. The enzyme that is not present is *succus entericus* is
 (a) maltase. (b) nucleases.
 (c) nucleosidase. (d) lipase.
166. In which of the following interaction both partners are adversely affected ?
 (a) Competition (b) Predation
 (c) Parasitism (d) Mutualism
167. Match the following list of microbes and their importance
- | | | | |
|----|------------------------------------|----|---|
| A. | <i>Saccharomyces cerevisiae</i> | 1. | Production of immuno suppressive agents |
| B. | <i>Monascus purpureus</i> | 2. | Ripening of Swiss cheese |
| C. | <i>Trichoderma polysporum</i> | 3. | Commercial production of ethanol |
| D. | <i>Propionibacterium sharmanii</i> | 4. | Production of blood-cholesterol lowering agents |
- Codes**
- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 3 | 4 | 1 | 2 |
| (b) | 4 | 3 | 2 | 1 |
| (c) | 4 | 2 | 1 | 3 |
| (d) | 3 | 1 | 4 | 2 |
168. A pleiotropic gene
 (a) is expressed only in primitive plants.
 (b) is a gene evolved during Pliocene.
 (c) controls a trait only in combination with another gene.
 (d) controls multiple traits in an individual.

169. A protoplast is a cell
(a) without plasma membrane.
(b) without nucleus.
(c) undergoing division.
(d) without cell wall.
170. Which of the following are most suitable indicators of SO_2 pollution in the environment ?
(a) Lichens (b) Conifers (c) Algae (d) Fungi
171. Grafted kidney may be rejected in a patient due to
(a) humoral immune response.
(b) cell-mediated immune response.
(c) passive immune response.
(d) innate immune response.
172. Which one of the following fruits is parthenocarpic ?
(a) Brinjal (b) Apple
(c) Jackfruit (d) Banana
173. Which of the following diseases is caused by a protozoan ?
(a) Syphilis (b) Influenza
(c) Babesiosis (d) Blastomycosis
174. In human females, meiosis-II is not completed until
(a) puberty. (b) fertilisation.
(c) uterine implantation. (d) birth.
175. Male gametophyte in angiosperms produces
(a) two sperms and a vegetative cell.
(b) single sperm and a vegetative cell.
(c) single sperm and two vegetative cells.
(d) three sperms.
176. Doctors use stethoscope to hear the sounds produced during each cardiac cycle. The second sound is heard when
(a) AV valves open up.
(b) Ventricular valve vibrate due to gushing in of blood from atria.
(c) Semilunar valves close down after the blood flows into vessels from ventricles
(d) AV node receives signal from SA node.
177. Auxin can be bioassayed by
(a) *Avena* coleoptile curvature.
(b) hydroponics.
(c) potometer.
(d) lettuce hypocotyl elongation.
178. Satellite DNA is important because it
(a) codes for proteins needed in cell cycle.
(b) shows high degree of polymorphism in population and also the same degree of polymorphism in an individual, which is heritable from parents to children.
(c) does not code for proteins and is same in all members of the population.
(d) codes for enzymes needed for DNA replication.
179. Cellular organelles with membranes are
(a) nuclei, ribosomes and mitochondria.
(b) chromosomes, ribosomes and endoplasmic reticulum.
(c) endoplasmic reticulum, ribosomes and nuclei.
(d) lysosomes, Golgi apparatus and mitochondria.
180. Eutrophication of water bodies leading to killing of fishes is mainly due to non-availability of
(a) food.
(b) light.
(c) essential minerals.
(d) oxygen.

Booklet Batch RollNumber

(A) 10+1 (S) 0 0 0 0 0 0 0 0 0 0
 (B) 10-2 (V) 1 1 1 1 1 1 1 1 1 1
 (C) 10-3 (A) 2 2 2 2 2 2 2 2 2 2
 (D) Crash (C) 3 3 3 3 3 3 3 3 3 3
 (E) 4 4 4 4 4 4 4 4 4 4
 (F) Paper 5 5 5 5 5 5 5 5 5 5
 (G) 6 6 6 6 6 6 6 6 6 6
 (H) Paper 1 (1) 7 7 7 7 7 7 7 7 7 7
 (I) Paper 2 (2) 8 8 8 8 8 8 8 8 8 8
 (J) 9 9 9 9 9 9 9 9 9 9

Name

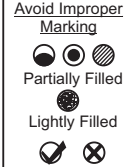
Test Date

Invigilator's Signature

Student's Signature

Certified that all the entries in this section have been properly filled by the student

The OMR Sheet will be computer checked. Fill the circles completely and dark enough for proper detection. Use ballpen (black or blue) for marking.



Test Center Code

0 0
1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9

1 (a) (b) (c) (d)	6 (a) (b) (c) (d)	11 (a) (b) (c) (d)	16 (a) (b) (c) (d)	21 (a) (b) (c) (d)	26 (a) (b) (c) (d)
2 (a) (b) (c) (d)	7 (a) (b) (c) (d)	12 (a) (b) (c) (d)	17 (a) (b) (c) (d)	22 (a) (b) (c) (d)	27 (a) (b) (c) (d)
3 (a) (b) (c) (d)	8 (a) (b) (c) (d)	13 (a) (b) (c) (d)	18 (a) (b) (c) (d)	23 (a) (b) (c) (d)	28 (a) (b) (c) (d)
4 (a) (b) (c) (d)	9 (a) (b) (c) (d)	14 (a) (b) (c) (d)	19 (a) (b) (c) (d)	24 (a) (b) (c) (d)	29 (a) (b) (c) (d)
5 (a) (b) (c) (d)	10 (a) (b) (c) (d)	15 (a) (b) (c) (d)	20 (a) (b) (c) (d)	25 (a) (b) (c) (d)	30 (a) (b) (c) (d)
31 (a) (b) (c) (d)	36 (a) (b) (c) (d)	41 (a) (b) (c) (d)	46 (a) (b) (c) (d)	51 (a) (b) (c) (d)	56 (a) (b) (c) (d)
32 (a) (b) (c) (d)	37 (a) (b) (c) (d)	42 (a) (b) (c) (d)	47 (a) (b) (c) (d)	52 (a) (b) (c) (d)	57 (a) (b) (c) (d)
33 (a) (b) (c) (d)	38 (a) (b) (c) (d)	43 (a) (b) (c) (d)	48 (a) (b) (c) (d)	53 (a) (b) (c) (d)	58 (a) (b) (c) (d)
34 (a) (b) (c) (d)	39 (a) (b) (c) (d)	44 (a) (b) (c) (d)	49 (a) (b) (c) (d)	54 (a) (b) (c) (d)	59 (a) (b) (c) (d)
35 (a) (b) (c) (d)	40 (a) (b) (c) (d)	45 (a) (b) (c) (d)	50 (a) (b) (c) (d)	55 (a) (b) (c) (d)	60 (a) (b) (c) (d)
61 (a) (b) (c) (d)	66 (a) (b) (c) (d)	71 (a) (b) (c) (d)	76 (a) (b) (c) (d)	81 (a) (b) (c) (d)	86 (a) (b) (c) (d)
62 (a) (b) (c) (d)	67 (a) (b) (c) (d)	72 (a) (b) (c) (d)	77 (a) (b) (c) (d)	82 (a) (b) (c) (d)	87 (a) (b) (c) (d)
63 (a) (b) (c) (d)	68 (a) (b) (c) (d)	73 (a) (b) (c) (d)	78 (a) (b) (c) (d)	83 (a) (b) (c) (d)	88 (a) (b) (c) (d)
64 (a) (b) (c) (d)	69 (a) (b) (c) (d)	74 (a) (b) (c) (d)	79 (a) (b) (c) (d)	84 (a) (b) (c) (d)	89 (a) (b) (c) (d)
65 (a) (b) (c) (d)	70 (a) (b) (c) (d)	75 (a) (b) (c) (d)	80 (a) (b) (c) (d)	85 (a) (b) (c) (d)	90 (a) (b) (c) (d)
91 (a) (b) (c) (d)	96 (a) (b) (c) (d)	101 (a) (b) (c) (d)	106 (a) (b) (c) (d)	111 (a) (b) (c) (d)	116 (a) (b) (c) (d)
92 (a) (b) (c) (d)	97 (a) (b) (c) (d)	102 (a) (b) (c) (d)	107 (a) (b) (c) (d)	112 (a) (b) (c) (d)	117 (a) (b) (c) (d)
93 (a) (b) (c) (d)	98 (a) (b) (c) (d)	103 (a) (b) (c) (d)	108 (a) (b) (c) (d)	113 (a) (b) (c) (d)	118 (a) (b) (c) (d)
94 (a) (b) (c) (d)	99 (a) (b) (c) (d)	104 (a) (b) (c) (d)	109 (a) (b) (c) (d)	114 (a) (b) (c) (d)	119 (a) (b) (c) (d)
95 (a) (b) (c) (d)	100 (a) (b) (c) (d)	105 (a) (b) (c) (d)	110 (a) (b) (c) (d)	115 (a) (b) (c) (d)	120 (a) (b) (c) (d)
121 (a) (b) (c) (d)	126 (a) (b) (c) (d)	131 (a) (b) (c) (d)	136 (a) (b) (c) (d)	141 (a) (b) (c) (d)	146 (a) (b) (c) (d)
122 (a) (b) (c) (d)	127 (a) (b) (c) (d)	132 (a) (b) (c) (d)	137 (a) (b) (c) (d)	142 (a) (b) (c) (d)	147 (a) (b) (c) (d)
123 (a) (b) (c) (d)	128 (a) (b) (c) (d)	133 (a) (b) (c) (d)	138 (a) (b) (c) (d)	143 (a) (b) (c) (d)	148 (a) (b) (c) (d)
124 (a) (b) (c) (d)	129 (a) (b) (c) (d)	134 (a) (b) (c) (d)	139 (a) (b) (c) (d)	144 (a) (b) (c) (d)	149 (a) (b) (c) (d)
125 (a) (b) (c) (d)	130 (a) (b) (c) (d)	135 (a) (b) (c) (d)	140 (a) (b) (c) (d)	145 (a) (b) (c) (d)	150 (a) (b) (c) (d)
151 (a) (b) (c) (d)	156 (a) (b) (c) (d)	161 (a) (b) (c) (d)	166 (a) (b) (c) (d)	171 (a) (b) (c) (d)	176 (a) (b) (c) (d)
152 (a) (b) (c) (d)	157 (a) (b) (c) (d)	162 (a) (b) (c) (d)	167 (a) (b) (c) (d)	172 (a) (b) (c) (d)	177 (a) (b) (c) (d)
153 (a) (b) (c) (d)	158 (a) (b) (c) (d)	163 (a) (b) (c) (d)	168 (a) (b) (c) (d)	173 (a) (b) (c) (d)	178 (a) (b) (c) (d)
154 (a) (b) (c) (d)	159 (a) (b) (c) (d)	164 (a) (b) (c) (d)	169 (a) (b) (c) (d)	174 (a) (b) (c) (d)	179 (a) (b) (c) (d)
155 (a) (b) (c) (d)	160 (a) (b) (c) (d)	165 (a) (b) (c) (d)	170 (a) (b) (c) (d)	175 (a) (b) (c) (d)	180 (a) (b) (c) (d)

ANSWER KEY

1	(b)	31	(d)	61	(a)	91	(c)	121	(b)	151	(b)
2	(d)	32	(b)	62	(a)	92	(a)	122	(c)	152	(b)
3	(d)	33	(c)	63	(b)	93	(a)	123	(b)	153	(d)
4	(b)	34	(a)	64	(a)	94	(c)	124	(a)	154	(a)
5	(a)	35	(a)	65	(d)	95	(d)	125	(c)	155	(a)
6	(b)	36	(b)	66	(d)	96	(a)	126	(d)	156	(d)
7	(d)	37	(d)	67	(a)	97	(a)	127	(b)	157	(d)
8	(b)	38	(a)	68	(a)	98	(a)	128	(b)	158	(a)
9	(a)	39	(b)	69	(a)	99	(b)	129	(d)	159	(b)
10	(a)	40	(c)	70	(d)	100	(a)	130	(c)	160	(d)
11	(c)	41	(a)	71	(c)	101	(a)	131	(b)	161	(b)
12	(a)	42	(b)	72	(a)	102	(c)	132	(c)	162	(b)
13	(b)	43	(b)	73	(d)	103	(b)	133	(b)	163	(b)
14	(a)	44	(d)	74	(a)	104	(c)	134	(b)	164	(a)
15	(a)	45	(a)	75	(c)	105	(d)	135	(b)	165	(b)
16	(d)	46	(d)	76	(d)	106	(b)	136	(b)	166	(a)
17	(a)	47	(a)	77	(b)	107	(b)	137	(a)	167	(a)
18	(a)	48	(d)	78	(b)	108	(b)	138	(b)	168	(d)
19	(b)	49	(a)	79	(d)	109	(d)	139	(d)	169	(d)
20	(c)	50	(b)	80	(d)	110	(c)	140	(b)	170	(a)
21	(b)	51	(b)	81	(a)	111	(a)	141	(b)	171	(b)
22	(d)	52	(c)	82	(a)	112	(b)	142	(a)	172	(d)
23	(a)	53	(c)	83	(b)	113	(a)	143	(c)	173	(c)
24	(a)	54	(c)	84	(b)	114	(c)	144	(a)	174	(b)
25	(d)	55	(a)	85	(d)	115	(d)	145	(d)	175	(a)
26	(a)	56	(b)	86	(d)	116	(b)	146	(d)	176	(c)
27	(b)	57	(c)	87	(b)	117	(c)	147	(b)	177	(a)
28	(a)	58	(a)	88	(a)	118	(c)	148	(a)	178	(b)
29	(b)	59	(a)	89	(d)	119	(d)	149	(b)	179	(d)
30	(a)	60	(c)	90	(d)	120	(c)	150	(a)	180	(d)

Finished Solving the Paper ?

Time to evaluate yourself !

**OSWAAL COGNITIVE
LEARNING TOOLS**

SCAN THE CODE

For elaborate
Solutions