



KIIT HIGHER SECONDARY SCHOOL

Entrance Wings

Minor Test-01

Date: 14/08/2025

Do not open this Test Booklet until you are asked to do so.

Important Instructions:

01. The answer sheet is inside this Test Booklet. When you are directed to open the Test Booklet, taken out the answer sheet and fill in the particulars on OFFICE Copy carefully with **blue/black** ball point pen only.
02. The test is of 3 hrs. duration and the Test Booklet contains **180** multiple-choice questions (four options with a single correct answer) from **Physics, Chemistry & Biology (Botany & Zoology)**. 45 questions in each subject and all questions are compulsory
03. Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For each incorrect response, **one mark** will be deducted from the total score. The maximum marks are **720**.
04. Use Blue/Black Ball Point Pen only for writing particulars on this page/making responses on Answer Sheet.
05. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
06. **On completion of the test, the candidate must hand over the Answer sheet (ORIGINAL and OFFICE Copy) to the invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.**
07. **The CODE for this Booklet is MT-01. Make sure that the CODE printed on the Original Copy of the Answer Sheet is the same as that on this Test Booklet.** In case of discrepancy, the candidate should immediately report the matter to the invigilator for replacement of both the Test Booklet and the Answer Sheet.
08. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
09. Use of white fluid for correction is NOT permissible on the Answer Sheet.
10. Each candidate must show on-demand his/her Admit Card to the Invigilator.
11. No candidate, without special permission of the centre Superintendent or Invigilator, would leave his/her seat.
12. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign (with time) the Attendance Sheet twice. **Cases, where a candidate has not signed the Attendance Sheet second time, will be deemed not to have handed over the Answer Sheet and dealt with as an Unfair Means case.**
13. Use of Electronic/Manual Calculator is prohibited.
14. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Room/Hall All cases of unfair means will be dealt with as per the Rules and Regulations of this examination.
15. **No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.**
16. The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

Name of the Candidate (in Capitals): _____

Roll Number: in figures _____

in Words _____

Centre of Examination (in Capitals): _____

Candidate's Signature: _____ Invigilator's Signature _____

Facsimile signature Stamp of Centre Superintendent: _____

Test Syllabus

Physics : Unit and Dimension, Current Electricity

Chemistry : Mole Concept & Chemical Bonding

Biology : Cell: The unit of life, Structural organisation in animal

PHYSICS

01. The drift velocity of electrons in a conducting wire is of the order of 1 mm/s, yet the bulb glows very quickly after the switch is put on because:

- (1) The random speed of electrons is very high, of the order of 10^6 m/s
- (2) The electrons transfer their energy very quickly through collisions
- (3) Electric field is set up in the wire very quickly, producing a current through each cross section, almost instantaneously.
- (4) All of the above.

02. In the presence of an applied electric field (\vec{E}) in a metallic conductor,

- (1) The electrons move in the direction of \vec{E}
- (2) The electrons move in a direction opposite to \vec{E} .
- (3) The electrons may move in any direction randomly, but slowly drift in the direction of \vec{E} .
- (4) The electrons move randomly but slowly drift in a direction opposite to \vec{E} .

03. A current of 4.8 A is flowing in a conductor. The number of electrons passing through any cross section per second is:

- (1) 3×10^{19}
- (2) 76.8×10^{20}
- (3) 7.68×10^{12}
- (4) 3×10^{10}

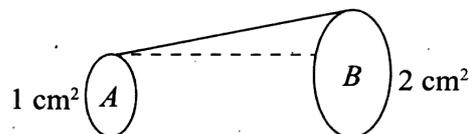
04. Two wires each of radius of cross section r but of different materials are connected together end to end (i.e. in series). If the densities of charge carriers in the two wires are in the ratio 1:4, the drift velocity of electrons in the two wires will be in the ratio.

- (1) 1:2
- (2) 2:1
- (3) 4:1
- (4) 1:4

05. A constant current is passed through a uniform conductor. Any given segment of the conductor will have:

- (1) Net negative charge
- (2) Net positive charge
- (3) Net zero charge
- (4) Net charge proportional to volume segment

06. A solid conductor has a cross section area 1cm^2 and 2cm^2 as shown in the figure. A current of 20A is entering at A. Then:



- (1) Current density at A = current density at B
- (2) Current density at A > current density at B
- (3) Current density at A < current density at B
- (4) None of the above

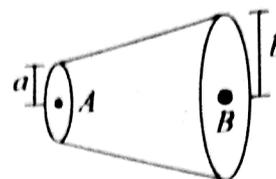
07. An isolated conducting sphere has a 10 cm radius. Two wires are connected at it, one carries a current of 1.000002 A into it and the other carries a current of 1.000000 A out of it. How long would it take for the sphere to increase its potential by 900 V as compared to its initial value?

- (1) 5 ms
- (2) 6 ms
- (3) 7 ms
- (4) None of these

08. Current flowing through a conducting wire is given by $I = (1 + 2t)$, where t is in seconds and current I is in amperes. The charge (in coulombs) flown through the resistor in the interval from $t=0$ to $t=1$ second is:

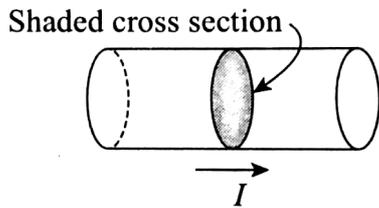
- (1) 3
- (2) 2
- (3) 1
- (4) 0

09. An electric current passes through non-uniform cross section wire made of homogenous and isotropic material. If J_A and J_B be the current densities and E_A and E_B be the electric field intensities at A and B respectively, then:

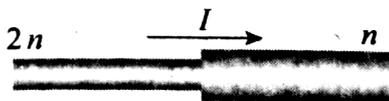


- (1) $j_A > j_B; E_A > E_B$
- (2) $j_A > j_B; E_A < E_B$
- (3) $j_A < j_B; E_A > E_B$
- (4) $j_A < j_B; E_A < E_B$

10. A metal wire of uniform cross sectional area 1mm^2 has a free electron density of $6 \times 10^{28}\text{m}^{-3}$. If the wire is carrying 0.96A current, what is the drift velocity of the free electrons along the wire? (Charge on electron $= 1.6 \times 10^{-19}\text{C}$)
- (1) 1m/s (2) 1cm/s
 (3) 1mm/s (4) 0.1mm/s
11. A current I flows through a cylindrical rod of uniform cross section area A and resistivity ρ . The electric flux through the shaded cross section of rod as shown in figure is:

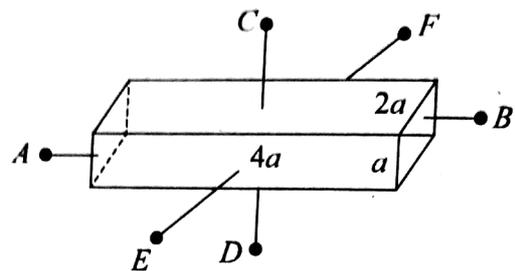


- (1) $\frac{I}{\rho}$ (2) ρI
 (3) $\frac{\rho I}{A}$ (4) $\frac{\rho A}{I}$
12. Two cylindrical rods of uniform cross section area A and $2A$, having free electrons per unit volume $2n$ and n , respectively, are joined in series. A current I flows through them in steady state. Then the ratio of drift velocity of free electron in left rod to drift velocity of electron in the right rod is:



- (1) 1:2 (2) 1:1
 (3) 2:1 (4) 4:1
13. Three copper wires of length and cross sectional area (L, A) , $(2L, \frac{A}{2})$ and $(\frac{L}{2}, 2A)$ are given. Resistance is minimum in:
- (1) Wire of cross section area A
 (2) Wire of cross sectional area $\frac{A}{2}$
 (3) Wire of cross sectional area $2A$
 (4) Same in all the three cases

14. The resistance of wire is $R\text{ohm}$. The wire is stretched to half of its diameter. The resistance of the wire will now be:
- (1) $4R$
 (2) $64R$
 (3) $\frac{R}{4}$
 (4) $16R$
15. A conductor with rectangular cross section has dimension $(a \times 2a \times 4a)$ as shown in figure R resistance across Ab is x , across CD is y and across EF is z . Then:



- (1) $x = y = z$
 (2) $x > y > z$
 (3) $y > z > x$
 (4) $x > z > y$
16. Resistance of wire is 20Ω . If it is stretched upto three times of its length, then its new resistance will be:
- (1) 6.67Ω
 (2) 60Ω
 (3) 120Ω
 (4) 180Ω
17. The length of the resistance wire is increased by 10%. What is the corresponding change in the resistance of wire?
- (1) 10%
 (2) 25%
 (3) 21%
 (4) 9%
18. The color bands on a carbon resistor are observed to be Yellow, Violet, and Orange from left to right. What is the value of the resistance?
- (1) $4.7\text{k}\Omega$
 (2) $47\text{k}\Omega$
 (3) $470\text{k}\Omega$
 (4) $4.7\text{M}\Omega$

19. The resistance of a wire of iron is 10Ω and temperature coefficient of resistivity is $5 \times 10^{-3}/^\circ\text{C}$. At 20°C , it carries 30 milliamperes of current. Keeping constant potential difference between its ends, the temperature of the wire is raised to 120°C . The current (in milliamperes) that flows in the wire at 120°C is nearly:

- (1) 20 (2) 15
(3) 10 (4) 40

20. Two resistances R_1 and R_2 are made of different materials. The temperature coefficient of the material of R_1 is α and of the material is $-\beta$. The resistance of the series combination of R_1 and R_2 will not change with temperature if $\frac{R_1}{R_2}$ equals:

if $\frac{R_1}{R_2}$ equals:

- (1) $\frac{\alpha}{\beta}$
(2) $\frac{\alpha + \beta}{\alpha - \beta}$
(3) $\frac{\alpha^2 + \beta^2}{\alpha\beta}$
(4) $\frac{\beta}{\alpha}$

21. A rectangular sheet of copper is 2.00 mm thick and has surface dimensions $8.0\text{ cm} \times 24\text{ cm}$. If the long edges are joined to form a tube 24 cm in length, find the resistance of the tube (in $\mu\Omega$) between the ends of the tube.

(Resistivity of copper $= 1.6 \times 10^{-8}\Omega\text{m}$)

- (1) 24 (2) 28
(3) 26 (4) 30

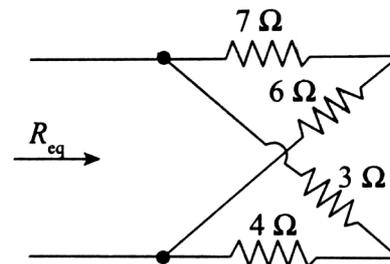
22. The resistance of bulb filament is 100Ω at a temperature of 100°C . If its temperature coefficient of resistance be 0.005 per $^\circ\text{C}$, its resistance will become 200Ω at a temperature of:

- (1) 500°C (2) 200°C
(3) 300°C (4) 400°C

23. A 150m long metal wire connects points A and B. The electric potential at point B is 50 V less than that at point A. If the conductivity of the metal is $60 \times 10^6\text{ ohm/m}$, then magnitude of the current density in the wire is equal to:

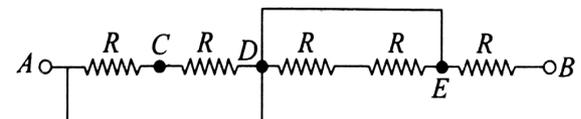
- (1) $11 \times 10^{-4}\text{ A/m}^2$
(2) $5.5 \times 10^{-3}\text{ A/m}^2$
(3) $4 \times 10^7\text{ A/m}^2$
(4) $20 \times 10^6\text{ A/m}^2$

24. In the given network of four resistors, the equivalent resistance is:



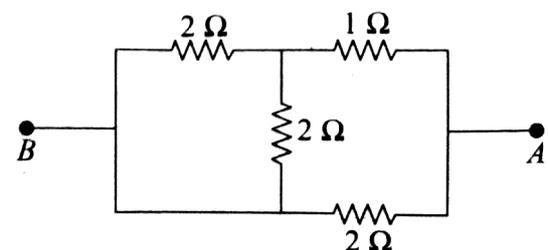
- (1) 20Ω (2) 5.4Ω
(3) 12Ω (4) 4.5Ω

25. In the given circuit, all resistors are of R ohm each. If a wire is connected between C and B, then the ratio of equivalent resistance between Ab of original circuit to new circuit formed is:



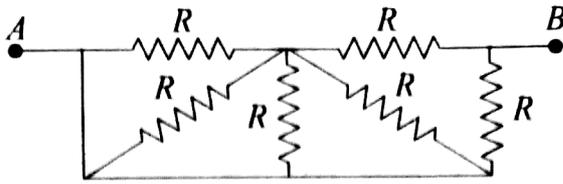
- (1) 1:1 (2) 3:1
(3) 1:3 (4) 1:2

26. In the circuit shown, the equivalent resistance between a points A and B is:



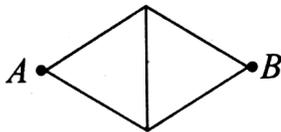
- (1) $\frac{5}{2}\Omega$ (2) $\frac{12}{7}\Omega$
(3) 1Ω (4) $\frac{14}{4}\Omega$

27. The equivalent resistance between the points A and B is:



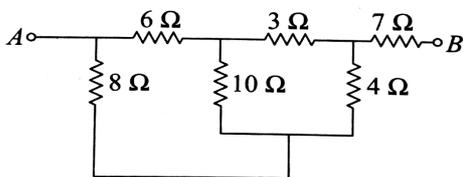
- (1) $\frac{5R}{9}$ (2) $\frac{2R}{3}$
 (3) R (4) None of these

28. A uniform wire of resistance R is stretched uniformly n times and then cut to form five identical wires. These wires are arranged as shown in the figure. The effective resistance between A and B will be:



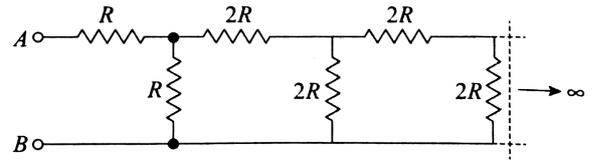
- (1) $\frac{nR}{5}$
 (2) $\frac{R}{5n^2}$
 (3) $\frac{n^2R}{5}$
 (4) $\frac{n^2R}{2}$

29. The equivalent resistance between the points A and B is:



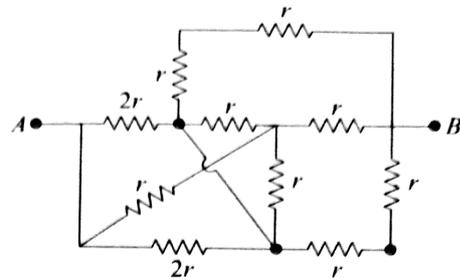
- (1) $\frac{36}{7}\Omega$
 (2) 10Ω
 (3) $\frac{85}{7}\Omega$
 (4) None of these

30. Find the equivalent resistance between A and B in the given circuit.



- (1) $\left(\frac{3-2\sqrt{5}}{2+\sqrt{5}}\right)R$ (2) $\left(\frac{3-2\sqrt{5}}{2-\sqrt{5}}\right)R$
 (3) $\left(\frac{3+2\sqrt{5}}{2-\sqrt{5}}\right)R$ (4) $\left(\frac{3+2\sqrt{5}}{2+\sqrt{5}}\right)R$

31. The equivalent resistance between A and b in the arrangement of resistances as shown is:

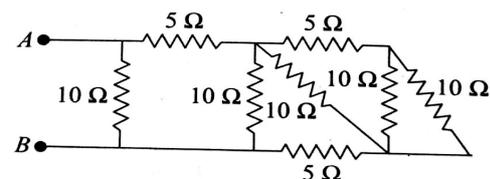


- (1) 4r (2) 3r
 (3) 2.5r (4) r

32. Five resistors are connected in a network. If $R_1 = 10\Omega$, $R_2 = 20\Omega$, $R_3 = 20\Omega$, $R_4 = 40\Omega$ and the central resistor $R_5 = 50\Omega$, calculate the equivalent resistance between points A and B. (Note: Imagine a bridge structure where R_1 , R_2 are the upper arms and R_3 , R_4 are the lower arms, with R_5 connecting the midpoints)

- (1) 10Ω (2) 20Ω
 (3) 30Ω (4) 40Ω

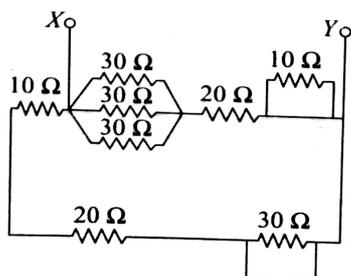
33. Find the equivalent resistance between terminals A and B.



- (1) 2.5Ω
 (2) 5Ω
 (3) 10Ω
 (4) 15Ω

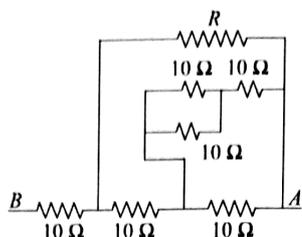


34. Find equivalent resistance between terminals X and Y:



- (1) 5Ω (2) 10Ω
 (3) 15Ω (4) 60Ω

35. For the network of resistance shown in the figure, the equivalent resistance of the network between the points A and B is 18Ω . The value of unknown resistance R is:



- (1) 8Ω (2) 10Ω
 (3) 16Ω (4) 24Ω

36. The unit of power is
 (1) joule (2) joule per second only
 (3) only watt (4) joule per second and watt both

37. The dimensions of physical quantity X in the equation $\text{Force} = \frac{X}{\text{Density}}$ is given by

- (1) $[M^1L^4T^{-2}]$ (2) $[M^3L^{-2}T^{-1}]$
 (3) $[M^2L^{-2}T^2]$ (4) $[M^1L^{-2}T^{-1}]$

38. The physical quantity which has dimensional formula as that of $\frac{\text{Energy}}{\text{Mass} \times \text{Length}}$ is

- (1) force
 (2) power
 (3) pressure
 (4) acceleration

39. In a system of units force (F), acceleration (A) and time (T) are taken as fundamental units, then the dimensional formula of energy is

- (1) $[FA^2T]$ (2) $[FAT^2]$
 (3) $[FA^2T^3]$ (4) $[FAT]$

40. Choose the correct statement(s).
 (i) A dimensionally correct equation may be correct.
 (ii) A dimensionally correct equation may be incorrect.
 (iii) A dimensionally incorrect equation may be correct.
 (iv) A dimensionally incorrect equation may be incorrect

- (1) Only 1 is correct (2) Only 2 is correct
 (3) Only 4 is correct (4) 1, 2 and 4 are correct

41. Which pair has the same dimensions?

- (1) Work and power
 (2) Density and relative density
 (3) Momentum and impulse
 (4) Stress and strain

42. For $10^{(at+3)}$, the dimensions of a is (Here, t = Time)

- (1) $[M^0L^0T^0]$ (2) $[M^0L^0T^1]$
 (3) $[M^0L^0T^{-1}]$ (4) none of these

43. The unit of potential energy is
 (1) $g \text{ cm s}^{-2}$ (2) $g \text{ cm}^2\text{s}^{-2}$
 (3) $g \text{ cm}^2\text{s}^{-1}$ (4) $g \text{ cm s}^{-1}$

44. The equation of state of some gases can be expressed as $\left(P + \frac{a}{V^2}\right)(V - b) = RT$, where P

is the pressure, V is the volume, T is the absolute temperature and a, b and R are constants. The dimensions of a are

- (1) $[ML^5T^{-2}]$ (2) $[ML^{-1}T^{-2}]$
 (3) $[L^3]$ (4) $[L^0]$

45. The equation of a wave is given by

$Y = A \sin \omega \left(\frac{x}{v} - k \right)$, where ω is the angular velocity, x is the displacement and v is the linear velocity. The dimensions of k is
 (1) $[LT]$ (2) $[T]$ (3) $[T^{-1}]$ (4) $[T^2]$

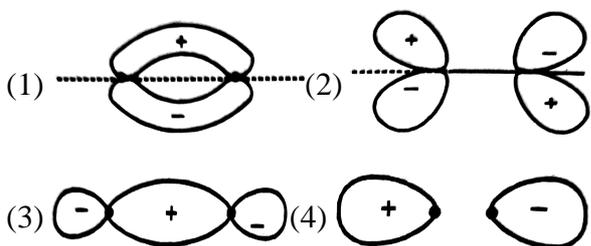


CHEMISTRY

46. The vapour density of a mixture containing NO_2 and N_2O_4 is 38.3 at 27°C .
The mole of NO_2 in 12 mol of mixture is:
(1) 3.3 (2) 4.25 (3) 4.0 (4) 8.0
47. Calculate the mass of Mohr's salt containing $1.5 N_A$ number of total cations when dissolving in water.
(1) 196 g (2) 198 g (3) 392 g (4) 246 g
48. How many gram of CO_2 has same number of molecules of 56 of N_2 ?
(1) 22 g (2) 44 g (3) 88 g (4) 66 g
49. Which of the following option is correct for the gaseous reaction? 'T' stands for True and 'F' stands for false.
 $x\text{X} + y\text{Y} \rightarrow w\text{W} + z\text{Z}$
(I) x mole of X produces w moles of W
(II) x gm of X produces z gram of Z
(III) y molecules of Y reacts with x molecules of X
(IV) y L of Y at STP produces z L of Z
(1) TFFT (2) TTTT
(3) FFFT (4) TFFT
50. Which is the limiting reactant in the following reaction $4\text{A} + \text{B} + 3\text{C} \rightarrow \text{A}_4\text{BC}_3$ if 0.5 mol of A, 0.8 mol of B and 0.6 mol of C reacts?
(1) B and C both (2) A only
(3) A and C both (4) B only
51. 4g of Na_2CO_3 reacts with 2g of HCl to produce salt, carbon dioxide and water. Calculate the amount by which the non limiting reactant is in the excess.
(1) 2.08 g (2) 2.4 g
(3) 1.09 g (4) 1.51 g
52. Crude calcium carbide is produced in an electric furnace by the reaction.
 $\text{CaO} + 3\text{C} \rightarrow \text{CaC}_2 + \text{CO}$
If 1280 kg of crude product is formed, then what should be the volume of CO gas evolved at 25°C and 1.5 atm?
(1) $326 \times 10^3 \text{L}$ (2) 54600 L
(3) $5.26 \times 10^3 \text{L}$ (4) $4.78 \times 10^2 \text{L}$
53. 25.3 g sodium carbonate, Na_2CO_3 , was dissolved in enough water to make 250 mL of solution. If sodium carbonate dissociates completely, molar concentration of Na^+ and carbonate ions are respectively:
(Molar mass of $\text{Na}_2\text{CO}_3 = 106 \text{ g mol}^{-1}$)
(1) 0.9555 M and 1.910 M
(2) 1.910 M and 0.955 M
(3) 1.90 M and 1.090 M
(4) 0.477 M and 0.477 M
54. The number of atoms in 0.1 mol of a triatomic gas is:
(1) 6.026×10^{23} (2) 1.806×10^{23}
(3) 3.600×10^{23} (4) 1.80×10^{23}
55. How many grams of concentrated nitric acid solution should be used to prepare 250 mL of 2.0 M HNO_3 ? The concentrated acid is 70% HNO_3 :
(1) 90.0 g conc. HNO_3 (2) 70.0 g conc. HNO_3
(3) 54.0 g conc. HNO_3 (4) 45.0 g conc. HNO_3
56. 6.02×10^{20} molecules of urea is present in 100 mL of its solution. The concentration of solution is:
(1) 0.01 M (2) 0.001 M
(3) 0.1 M (4) 0.02 M
57. In an experiment it is shown that 10 mL of 0.05 M solution of chloride required 10 mL of 0.1 M solution of AgNO_3 , which of the following will be the formula of the chloride (X stands for the symbol of the element other than chlorine):
(1) X_2Cl (2) X_2Cl_2
(3) XCl_2 (4) XCl_4
58. When 22.4 L of $\text{H}_2(\text{g})$ is mixed with 11.2 L of $\text{Cl}_2(\text{g})$, each at STP, the moles of $\text{HCl}(\text{g})$ formed is equal to:
(1) 1 mole of $\text{HCl}(\text{g})$ (2) 2 moles of $\text{HCl}(\text{g})$
(3) 0.5 mole of $\text{HCl}(\text{g})$ (4) 1.5 mole of $\text{HCl}(\text{g})$
59. 1.0 g of magnesium is burnt with 0.56 g O_2 in a closed vessel. Which reactant is left in excess and how much?
(At wt.: Mg=24; O=16)
(1) Mg, 0.16 g (2) O_2 , 0.16g
(3) Mg, 0.44 g (4) O_2 , 0.28g



60. A mixture of gases contains H_2 and O_2 gases in the ratio of 1:4 (w/w). What is the molar ratio of the two gases in the mixture?
(1) 16:1 (2) 2:1 (3) 1:4 (4) 4:1
61. The number of water molecules in maximum in:
(1) 18 grams of water
(2) 18 moles of water
(3) 18 molecules of water
(4) 1.8 grams of water
62. In 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:
(1) The ratio of chemical species to each other in a balanced equation
(2) The ratio of elements to each other in a compound
(3) The definition of mass in units of grams
(4) The mass of one mole of grams
63. 20.0 g of magnesium carbonate sample decomposes on heating to give carbon dioxide and 8.0 g magnesium oxide. What be the percentage purity of magnesium carbonate in the sample?
(At. wt.: Mg=24)
(1) 60 (2) 84 (3) 75 (4) 96
64. What is the mass of the precipitate formed when 50 mL of 16.9% solution of $AgNO_3$ is mixed with 50 mL of 5.8% $NaCl$ solution?
(Ag = 107.8, N=14, O=16, Na=23, Cl=35.5)
(1) 7g (2) 14 g (3) 28g (4) 3.5g
65. A mixture of 2.3 g formic acid and 4.5 g oxalic acid is treated with conc. H_2SO_4 . The evolved gaseous mixture is passed through KOH pellet. Weight (in g) of the remaining product at STP will be:
(1) 1.4 (2) 3.0
(3) 2.8 (4) 4.4
66. In which case in the number of molecules of water maximum ?
(1) 18 mL of water
(2) 0.18 g of water
(3) 0.00224 L of water vapour at 1 atm and 273 K
(4) 10^{-3} mol of water
67. The number of moles of hydrogen molecule required to produce 20 moles of ammonia through Haber's process is:
(1) 40 (2) 10 (3) 20 (4) 30
68. Which one of the following has maximum number of atoms?
(1) 1g of Li(s) [Atomic mass of Li=7]
(2) 1g of Ag(s) [Atomic mass of Ag=108]
(3) 1g of Mg(s) [Atomic mass of Mg=24]
(4) 1g of $O_{2(g)}$ [Atomic mass of O=16]
69. In one molal solution that contains 0.5 mol of a solute, there is:
(1) 100 mL of solvent (2) 1000 g of solvent
(3) 500 mL of solvent (4) 500 g of solvent
70. What mass of 95% pure $CaCO_3$ will be required to neutralise 50 mL of 0.5 M HCl solution according to the following reaction?
 $CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + 2H_2O(l)$
[Calculate up to second place of decimal point]
(1) 3.65 g (2) 9.50 g
(3) 1.25 g (4) 1.32 g
71. Both BF_3 and NF_3 are covalent compounds. BF_3 is a nonpolar compound but NF_3 is polar. The reason for it is:
(1) Boron is a solid but nitrogen is gas
(2) Atomic size of boron is smaller than nitrogen
(3) Nitrogen is more electronegative than boron
(4) BF_3 is trigonal planar but NF_3 is pyramidal
72. The dipole moment of LiH is 5.75 and its bond length is 1.596 \AA . The percentage of ionic character in LiH is:
(1) 90% (2) 20% (3) 75% (4) 33.33%
73. which of the following combination of atoms A and B forms anti-bonding molecular orbital?
(1) $\frac{\psi_A^2}{\psi_B^2}$ (2) $\psi_A^2 \times \psi_B^2$
(3) $\psi_A + \psi_B$ (4) $\psi_A - \psi_B$
74. The correct decreasing order of bond angles of NO_2^-, NO_2^+ and NO_2 is:
(1) $NO_2^- > NO_2^+ > NO_2$
(2) $NO_2^- > NO_2 > NO_2^+$
(3) $NO_2 > NO_2^- > NO_2^+$
(4) $NO_2^+ > NO_2 > NO_2^-$

75. Which of the following combination s gives the probability of finding of electrons in anti-bonding molecular orbitals?
 (1) $\psi_A^2 + \psi_B^2$ (2) $\psi_A^2 - \psi_B^2$
 (3) $\psi_A^2 + \psi_B^2 + 2\psi_A\psi_B$ (4) $\psi_A^2 + \psi_B^2 - 2\psi_A\psi_B$
76. In $\overset{2}{\text{C}}\text{H}_2\overset{1}{\text{C}}\text{OOH}$ both the carbon atoms are present in _____ and _____ hybrid state respectively:
 (1) sp, sp^2 (2) sp^2, sp^3 (3) sp^2, sp^2 (4) sp^3, sp^3
77. Which of the following sketch for orbital configuration (considering boundary surface only) is correct for orbital type $\pi^* 2p_x$?

78. Total number of sigma, pi bonds, lone pair of electron present in urea is:
 (1) $6\sigma, 1\pi, 3lp$ (2) $8\sigma, 0\pi, 3lp$
 (3) $7\sigma, 1\pi, 5lp$ (4) $7\sigma, 1\pi, 4lp$
79. Formal charge on nitrogen in $\overset{-}{\text{O}} - \overset{\cdot\cdot}{\text{N}} = \overset{\cdot\cdot}{\text{O}}$ is:
 (1) 0 (2) +1 (3) -1 (4) +2
80. Carbon atoms in $\text{C}_2(\text{CN})_4$ are:
 (1) sp hybridized
 (2) sp^2 hybridised
 (3) sp and sp^2 hybridised
 (4) sp, sp^2 and sp^3 hybridised
81. According to M.O.T for O_2^+ :
 (1) B.O. is less than that of O_2 and O_2^+ is paramagnetic
 (2) B.O. is more than that of O_2 and O_2^+ is paramagnetic
 (3) B.O. is less than that of O_2 and O_2^+ is diamagnetic
 (4) B.O. is more than that of O_2 and O_2^+ is diamagnetic
82. Which of the following does not have pyramidal shape?
 (1) SO_3^{2-} (2) NO_3^- (3) NH_3 (4) $\overset{\ominus}{\text{C}}\text{H}_3$
83. Among $\text{KO}_2, \text{AlO}_2^-, \text{BaO}_2$ and NO_2^+ , unpaired electron is present in:
 (1) NO_2^+ and BaO_2 (2) KO_2 and AlO_2^-
 (3) KO_2 only (4) BaO_2 only
84. In which one of the following triplets, all the members are diamagnetic?
 (1) $\text{B}_2, \text{CO}, \text{NO}^+$ (2) $\text{Cu}^+, \text{O}_2^{2-}, \text{O}_2$
 (3) $\text{N}_2^{2-}, \text{O}_2^{+2}, \text{NO}^-$ (4) $\text{O}_3, \text{N}_2^{2+}, \text{N}_2\text{O}$
85. The xenon compound(s) that are isostructural with IBr_2^- and BrO_3^- respectively are:
 (1) Linear XeF_2 and pyramidal XeO_3
 (2) Bent XeF_2 and pyramidal XeO_3
 (3) Bent XeF_2 and planar XeO_3
 (4) Linear XeF_2 and square planar XeO_3
86. Bond order of N_2^+ and CO^+ are respectively:
 (1) 2.5 and 2.5 (2) 3 and 2.5
 (3) 3.5 and 2.5 (4) 2.5 and 3.5
87. Which of the following pair contains isoelectronic and isostructural ions?
 (1) $\text{NO}_3^-, \text{CO}_3^{2-}$ (2) $\text{ClO}_4^-, \text{NO}_3^-$
 (3) $\text{ClO}_3^-, \text{CO}_3^{2-}$ (4) $\text{CO}_3^{2-}, \text{ClO}_4^-$
88. In BrF_3 molecule, the lone pair occupy equatorial position to minimize:
 (1) Lone pair - bond pair repulsion only
 (2) Bond pair - bond pair repulsion only
 (3) Lone pair - lone pair repulsion and lone pair - bond pair repulsion
 (4) Lone pair - lone pair repulsion
89. The pair of species having identical shape is:
 (1) NH_3, BF_3 (2) CO_2, SO_2
 (3) $\text{SO}_3, \text{BrF}_3$ (4) $\text{H}_2\text{O}, \text{H}_2\text{S}$
90. The hybridization of phosphorus in H_3PO_4 and H_3PO_3 respectively is:
 (1) sp^3, sp^3 (2) sp^3, sp^2
 (3) sp^3, sp (4) sp^2, sp^3d

BIOLOGY

91. Select the correct option with respect to cockroaches.
- (1) The fore wings are tegmina which are used in flight.
 - (2) Malpighian tubules convert nitrogenous wastes into urea
 - (3) Males bear short anal styles not present in females
 - (4) Nervous system comprises of a dorsal nerve cord and ten pairs of ganglion
92. What external changes are visible after the last moult of a cockroach nymph?
- (1) Anal cerci develop
 - (2) Both fore wings and hind wings develop
 - (3) Labium develops
 - (4) Mandibles become harder
93. Identify the tissue shown in the diagram and match with its characteristics and its location.



- (1) Skeletal muscle, shows striations and closely attached with the bones of the limbs
 - (2) Smooth muscles, show branching, found in the walls of the heart
 - (3) Cardiac muscles, unbranched muscles, found in the walls of the heart
 - (4) Striated muscles, tapering at both ends, attached with the bones of the ribs
94. Choose the correctly matched pair.
- (1) Tendon-Specialised connective tissue
 - (2) Adipose-Dense connective tissue
 - (3) Areolar tissue-Loose connective tissue
 - (4) Cartilage-Loose connective tissue
95. Choose the correctly matched pair.
- (1) Inner lining of salivary duct - Ciliated epithelium
 - (2) Moist surface of buccal cavity - Glandular epithelium
 - (3) Tubular parts of nephrons - Cuboidal epithelium
 - (4) Inner surface of bronchioles - Squamous epithelium

96. The body cells in cockroach discharge their nitrogenous waste in the haemolymph mainly in the form of:
- (1) Potassium urate
 - (2) Urea
 - (3) Calcium carbonate
 - (4) Ammonia
97. Fill in the blanks and choose the correct option given below.
- (i) The arrangement of axonemal microtubules in flagella is referred to as **A** array.
 - (ii) In flagella, the central tubules are connected by bridges and is enclosed by **B**, which is connected to one of each peripheral doublets by **C**.
 - (iii) The cilium and flagellum emerge from centriole-like structure called the **D**.
 - (iv) Centriole is made up of nine evenly spaced peripheral fibrils of **E** protein.
 - (v) The central part of the proximal region of the centriole is called **F**, which is connected with tubules of peripheral triplets by **G**.
 - (vi) The space between two parallel membranes of nuclear envelope is called **H**.
 - (vii) The nuclear matrix is called as **I**, which contain **J** and chromatin.
 - (viii) Nucleolus is a site for **K** RNA synthesis.
 - (ix) The interphase nucleus has a loose and indistinct network of nucleoprotein fibres called **L**, which contains DNA and some basic protein called **M**.
 - (x) Based on position of **N**, chromosome are metacentric, sub-metacentric, **O** and **P**.
 - (xi) The primary constriction in a structure of chromosome is **Q** and the secondary constriction give small fragment called **R**.
 - (xii) The **S** in the plastid is the site of light reactions and the **T** of dark reaction.
- (1) A- 9+2 array, C-Radial spokes, E-Flagellin, O-Metacentric
 - (2) B-Central Sheath, E-Tubulin, G-Radial Spokes, S-Stroma
 - (3) D-Basal bodies, K-Ribosomal, N-Centromere, P-Telocentric
 - (4) E-Tubulin, F-Hub, R-Satellite, T-Grana
98. Which of the following statements wrongly represents the nature of smooth muscle?
- (1) These muscles are present in the wall of blood vessels
 - (2) These muscle have no striation
 - (3) They are involuntary muscles
 - (4) Communication among the cells is performed by intercalated discs

99. Which of the following statements regarding the nervous system of *Periplaneta americana* is correct?

- (1) The brain is represented by the sub-oesophageal ganglion which supplies nerves to the antennae and compound eyes.
- (2) The nervous system consists of a series of fused, segmentally arranged ganglia joined by paired dorsal longitudinal connectives.
- (3) If the head of a cockroach is cut off, it will still live for as long as one week.
- (4) There are four thoracic ganglia and five abdominal ganglia.

100. Match List-I with List-II.

List-I		List-II	
A	Bronchioles	I	Dense Regular Connective Tissue
B	Goblet cell	II	Loose connective Tissue
C	Tendons	III	Glandular Tissue
D	Adipose Tissue	IV	Ciliated Epithelium

- (1) A-I, B-II, C-III, D-IV
- (2) A-II, B-I, C-IV, D-III
- (3) A-III, B-IV, C-II, D-I
- (4) A-IV, B-III, C-I, D-II

101. **Statement-I:** The alimentary canal of the frog is short.

Statement-II: Frogs are carnivores

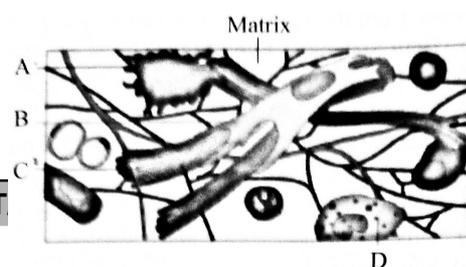
- (1) Both statement I and II are correct
- (2) Both statement I and II are incorrect
- (3) Statement I is correct but II is incorrect
- (4) Statement II is correct but I is incorrect

102. Which of the following statement(s) is/are correct?

- (i) Loose connective tissue contains fibroblasts, macrophages and mast cells
- (ii) Adipose tissue is a type of dense connective tissue located mainly beneath the skin
- (iii) Tendons and ligaments are examples of dense irregular connective tissue
- (iv) Cartilage, bones and blood are various types of specialized connective tissue

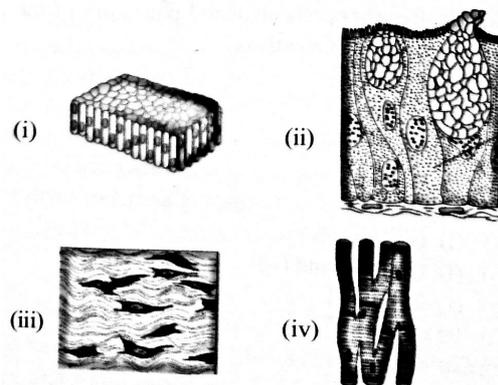
- (1) Only i
- (2) Both i and iv
- (3) Both i and iii
- (4) i, ii and iv

103. Given below is the diagrammatic sketch of a certain type of connective tissue. Identify the parts labelled as A, B, C and D and select the correct answer from the given option.



	Part A	Part B	Part C	Part D
1)	Macrophage	Fibroblast	Collagen fibres	Mast cell
2)	Mast cell	Macrophage	Fibroblast	Collagen fibres
3)	Macrophage	Collagen fibres	Fibroblast	Mast cell
4)	Mast cell	Collagen fibres	Fibroblast	Macrophage

104. The four sketches (i, ii, iii and iv) given below, represent four different types of animal tissues. Which one of these is correctly identified in the options given along with its correct location and function?



	Tissue	Location	Function
1)	(ii) Glandular epithelium	Intestine	Secretion
2)	(iii) Collagen fibres	Cartilage	Attach skeletal muscles to bones
3)	(iv) Smooth muscle tissue	Heart	Heart contraction
4)	(i) Columnar epithelium	Nephron	Secretion and absorption

105. Consider the following four statements (A-D) related to the common frog *Rana tigrina* and select the correct option starting which ones are true (T) and which ones are false (F).

- (A) On dry land it would die due to lack of O_2 . Its mouth is forcibly kept closed for a few days
- (B) It has four-chambered heart
- (C) On dry land it turns uricotelic from ureotelic
- (D) Its life-history is carried out in pond water

	A	B	C	D
1)	T	F	F	T
2)	T	T	F	F
3)	F	F	T	T
4)	F	T	T	F

106. Statement-I: In the heart of frog, the ventricles open into conus arteriosus.

Statement-II: Sinus venosus joins the right atrium.

- (1) Both statement I and II are correct
- (2) Both statement I and II are incorrect
- (3) Statement I is correct but II is incorrect
- (4) Statement II is correct but I is incorrect

107. Statement-I: Fertilisation of frog is external and takes place in water.

Statement-II: In frogs vasa efferentia enter the kidneys and open Bidder's canal.

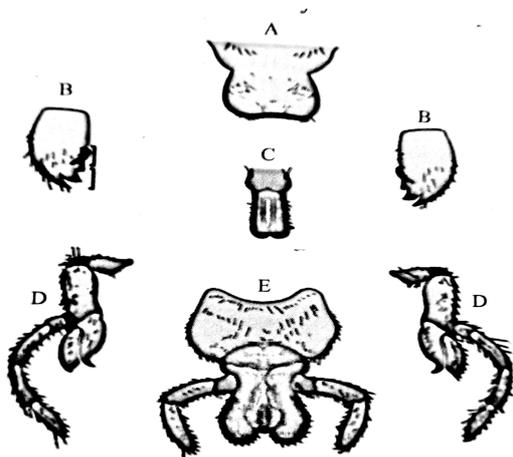
- (1) Both statement I and II are correct
- (2) Both statement I and II are incorrect
- (3) Statement I is correct but II is incorrect
- (4) Statement II is correct but I is incorrect

108. Match the Column-I with Column II and select the correct option using codes given below.

Column-I		Column-II	
A	Simple columnar	I	Wall of heart epithelium
B	Cardiac muscle	II	Bone joint
C	Adipose tissue	III	Inner lining of stomach and intestine
D	Hyaline cartilage	IV	Below the skin of the abdomen, buttocks, thighs and breasts

- (1) A-III, B-I, C-II, D-IV
- (2) A-III, B-IV, C-II, D-I
- (3) A-I, B-III, C-IV, D-II
- (4) A-III, B-I, C-IV, D-II

109. The below figures represent mouth parts of cockroach, marked from A to E. Identify these marked parts.



(1) A-Maxilla, B-Hypopharynx, C-Labium, D-Mandible, E-Labrum

(2) A-Mandible, B-Labium, C-Maxilla, D-Labrum, E-Hypopharynx

(3) A-Labrum, B-Mandible, C-Hypopharynx, D-Maxilla, E-Labium

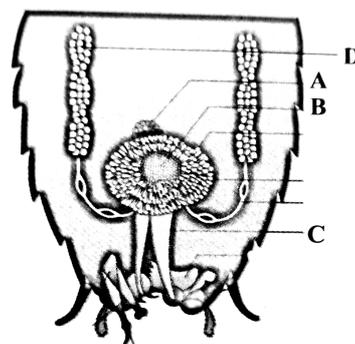
(4) A-Labium, B-Hypopharynx, C-Labrum, D-Maxilla, E-Mandible

110. Statement-I: Tendons attach one bone to another bone.

Statement-II: Ligaments attach skeletal muscles to bones.

- (1) Both statement I and II are correct
- (2) Both statement I and II are incorrect
- (3) Statement I is correct but II is incorrect
- (4) Statement II is correct but I is incorrect

111. Study the given figure of reproductive system of male cockroach having markings A, B, C and D. In which of the labelled parts, sperm are stored?



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

112. Read the statements regarding frog. Which of the statements is/are correct and incorrect?

- (i) The medulla oblongata passes out through foramen of Monro and continues into spinal cord.
 - (ii) Vasa efferentia are 10-12 in number that arise from testes.
 - (iii) Ovaries have no functional connection with kidneys.
 - (iv) Frogs are uricotelic
- (1) Statements (i), (ii) and (iii) are correct while statement (iv) is incorrect
 - (2) Statements (i) and (ii) are correct while statements (iii) and (iv) are incorrect
 - (3) Statements (ii) and (iii) are correct while statements (i) and (iv) are incorrect
 - (4) Statements (ii), (iii) and (iv) are correct while statement (i) is incorrect



Direction (Qs. No. 13-19) These questions consists of two statements, each printed as **Assertion and Reason**. While answering these questions, you are required to choose any one of the following four responses.

(1) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

(2) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.

(3) Assertion is correct but Reason is not correct

(4) Assertion is not correct but Reason is correct

113. **Assertion:** The cell secretes fibres of structural protein in all the connective tissues except blood.
Reason: Neuroglia make up more than one half the volume of neural tissue in our body.

114. **Assertion:** Stomach and intestine of our body are lined by columnar epithelium.
Reason: Columnar epithelium helps in secretion and absorption.

115. **Assertion:** Smooth muscles are involuntary in nature.
Reason: Their functioning cannot be directly controlled.

116. **Assertion:** Fertilised eggs of cockroach are encased in capsules called oothecae.
Reason: Ootheca is a dark reddish to blackish brown capsule.

117. **Assertion:** Presence of connective tissue inside the brain is essential for conduction of nerve impulse.
Reason: Neuroglia cells hold together the nerve cells of brain.

118. **Assertion:** Cockroach shows sexual dimorphism.
Reason: The female cockroach bears a pair of short thread like anal styles.

119. **Assertion:** There is hepatic portal system in frogs.
Reason: Hepatic portal system is venous connection between liver and intestine in frog.

120. Match the column-I with column-II and select the correct answer using the codes given below.

Column-I		Column-II	
A	Neuron	I	Hard and non-pliable
B	Bone	II	Nissl bodies
C	RBC of man	III	Solid and pliable
D	Cartilage	IV	Non-nucleated

(1) A-IV, B-II, C-III, D-I

(2) A-IV, B-I, C-III, D-II

(3) A-IV, B-II, C-I, D-II

(4) A-II, B-I, C-IV, D-III

121. Which of the following is not true of connective tissue?

(i) Connective tissues are most abundant and widely distributed in the body of complex animals.

(ii) They connect and support other tissues.

(iii) They include such diverse tissues as bone, cartilage, tendons, adipose and loose connective tissues.

(iv) They form the internal and external lining of many organs.

(v) In all connective tissues except blood, the cells secrete fibres of structural proteins called collagen or elastin

(1) Only (iv)

(2) Only (v)

(3) (i) and (ii)

(4) (ii) and (v)

122. Statement-I: Cartilage (protein matrix) and bone (calcium matrix) are rigid connective tissue.

Statement-II: Blood is connective tissue in which plasma is the matrix.

(1) Both statement I and II are correct

(2) Both statement I and II are incorrect

(3) Statement I is correct but statement II is incorrect

(4) Statement II is correct but statement I is incorrect

123. Match column-I with column-II and select the correct answer using the codes given below.

Column-I		Column-II	
A	Squamous	I	Intestinal glands
B	Cuboidal	II	Bronchioles
C	Columnar	III	Ovary
D	Ciliated	IV	Blood vessels

(1) A-I, B-II, C-IV, D-III

(2) A-III, B-IV, C-II, D-I

(3) A-IV, B-III, C-II, D-I

(4) A-IV, B-III, C-I, D-II

124. Which muscle fibre taper at both ends (fusiform) and do not show striations?

(1) Skeletal muscle

(2) Cardiac muscle

(3) Both (1) and (2)

(4) Smooth muscle



125. Select the correct statement from the ones given below with respect to *Periplaneta americana*.
(1) Nervous system located dorsally, consists of segmentally arranged ganglia joined by a pair of longitudinal connectives.
(2) Males bear a pair of short thread like anal styles.
(3) There are 16 very long Malpighian tubules present at the junctions of midgut and hindgut.
(4) Grinding of food is carried out only by the mouth parts.
126. How many statements are correct for epithelium?
(i) It provides a covering for some body parts.
(ii) Cells are compactly packed
(iii) Less intercellular material
(iv) Compound epithelium has protective function.
(1) One (2) Three
(3) Two (4) Four
127. Which of the following is incorrect about columnar epithelium?
(i) It is made of tall and slender cells.
(ii) Free surface many have microvilli.
(iii) They are found in stomach and intestine and help in secretion and absorption.
(iv) Ciliated epithelium is mainly present in hollow structure like bronchioles and fallopian tubes/products.
(v) They have apical nuclei
(1) Only (i) (2) Only (iv)
(3) (ii) and (iv) (4) (ii) and (iii)
128. Frog differ from humans in possessing:
(1) Nucleated red blood cells
(2) Thyroid as well as parathyroid
(3) Paired cerebral hemispheres
(4) Hepatic portal system
129. Which of the following is a wrongly matched pair?
(1) Unicellular glandular cells - Goblet cell
(2) Saliva - Exocrine secretion
(3) Fusiform fibres - Smooth muscle
(4) Cartilage - Areolar tissue
130. Which one of the following pairs of structures distinguish a nerve cell from other types of cell?
(1) Vacuoles and Fibres
(2) Flagellum and Mendullary sheath
(3) Nucleus and Mitochondria
(4) Cell body and Dendrites
131. Which of the following statements is not correct regarding neural tissue?
(1) It exerts the greatest control over the body's responsiveness to changing conditions.
(2) Chondrocytes, the unit of neural system are excitable cells.
(3) Neuroglial cells protect and support neurons.
(4) When a neuron is suitable stimulated, an electrical disturbance is generated.
132. Gizzard (proventriculus) in cockroach lies between:
(1) Oesophagus and stomach
(2) Crop and mesenteron
(3) Mesenteron and ileum
(4) Oesophagus and crop
133. Which one of the following is one of the paths followed by air or O_2 during respiration in the adult male *Periplaneta Americana* as it enters the animal body?
(1) Spiracle in metathorax, trachea, tracheoles, oxygen diffuses into the cells.
(2) Mouth, bronchial tube, trachea, oxygen enters cells
(3) Spiracles in prothorax, tracheoles, trachea, oxygen diffuses into cells.
(4) Hypopharynx, mouth, pharynx, trachea, tissues.
134. Which of the following statements is incorrect regarding the anatomy of *periplaneta americana*?
(1) A ring of 6-8 blind tubules called hepatic caecae is present at the junction of foregut and midgut.
(2) The blood vascular system is of the open type with a 13-chambered tubular heart.
(3) The female reproductive system consists of two large ovaries lying laterally in the 2nd to 6th abdominal segments.
(4) Exchange of gases occurs at the tracheoles by the process of active transport.
135. What external changes are visible after the last moult of a cockroach nymph?
(1) Development of anal cerci.
(2) Development of both forewings and hind wings.
(3) Development labium
(4) Mandibles become harder



BIOLOGY

136. Select the incorrect statement about prokaryotic ribosomes:
- (1) 50S and 30S subunits unite to form 70S ribosomes.
 - (2) Polysome/polyribosome consists of many ribosomes only.
 - (3) Ribosomes is the site of protein synthesis.
 - (4) Polysome indicate the synthesis of identical polypeptide in multiple copies.
137. If all the ribosomes of a cell are destroyed:
- (1) Respiration will not take place
 - (2) Photosynthesis will not occur
 - (3) Fat will not be stored
 - (4) Protein will not be formed
138. Which of the following is incorrect?
- (1) Mycoplasma is the smallest cell (0.3 μ)
 - (2) Bacteria are 3 to 5 μ m is size
 - (3) The largest cell is the egg of an ostrich
 - (4) Nerve cells are some of the smallest cells
139. Microtubules, motor proteins, and actin filaments are all part of the:
- (1) Mechanism of photosynthesis that occur in chloroplast.
 - (2) Rough ER in prokaryotic cells
 - (3) Cytoskeleton of eukaryotic cells
 - (4) Process that moves small molecules across cell membranes.
140. Which of the following statements are correct?
- (1) Na⁺ / K⁺ pump is an example of active transport.
 - (2) In plant cells lipid like steroidal hormones are synthesized in SER.
 - (3) In plant cells, the vacuoles can occupy up to 10% of the volume of the cell.
 - (4) Chlorophyll and leucoplast are responsible for trapping light energy essential for photosynthesis.
141. The membrane of the erythrocytes has approximately ____% of proteins and ____% lipids.
- (1) 42, 50 (2) 52, 40
 - (3) 50, 50 (4) 60, 40
142. _____ is the important site of formation of glycoproteins and glycolipids.
- (1) SER (2) Lysosome
 - (3) Golgi apparatus (4) Mitochondria

143. Which one of the following combination is mismatched?
- (1) Glycocalyx - May be capsule or slime layer
 - (2) Pili - help motility
 - (3) Cell wall - Protective, determines shape, prevents from bursting
 - (4) Flagella, pili and fimbria - Surface structures of bacterial cell
144. Explain why the samples having ER, nucleus were belonged to eukaryotic cell and not prokaryotic cell? Because:
- (1) Eukaryotic cell have membrane bound organelles.
 - (2) Eukaryotic cell have non - Membrane bound organelles.
 - (3) Eukaryotic cell are smaller and multiply more rapidly than prokaryotic cells.
 - (4) Eukaryotic cell are larger and multiply more rapidly than prokaryotic cells.
145. In which of the following the cells are held together by a Calcium-pectate layer?
- (1) Primary cell wall (2) Secondary cell wall
 - (3) Middle lamella (4) Tertiary cell wall
146. Statement-I: Ribosomes are non-membrane bound organelles found in the prokaryotic cells only.
Statement-II: Ribosomes are present only in the cytoplasm.
- (1) Both statement I and II are correct
 - (2) Both statement I and II are incorrect
 - (3) Statement I is correct but II is incorrect
 - (4) Statement II is correct and I is incorrect
147. Mitochondrial cristae are sites of:
- (1) Breakdown of macromolecules
 - (2) Protein synthesis
 - (3) Phosphorylation of flavoproteins
 - (4) Oxidation-reduction reactions
148. Enzyme found functional in lysosome is:
- (1) Acid phosphates (2) Basis phosphatase
 - (3) Oxidoreductase (4) Lyases
149. Match the cell organelles given in column-I with cellular processes in column-II and select the correct option from the codes given below.

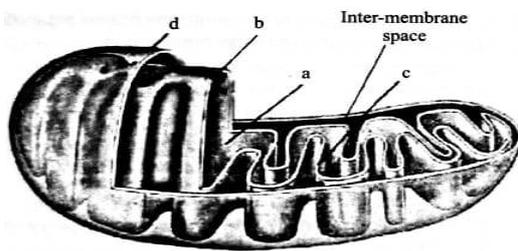
Column-I (Cell organelles)		Column-II (Cellular Processes)	
A	Lysosomes	I	Protein synthesis
B	Ribosomes	II	Hydrolytic activity
C	Smooth endoplasmic reticulum	III	Steroid synthesis
D	Centriole	IV	Formation of spindle

- (1) A-II, B-I, C-III, D-IV
- (2) A-I, B-III, C-IV, D-II
- (3) A-I, B-IV, C-III, D-II
- (4) A-IV, B-III, C-I, D-II

150. What would happen if lysosomes get ruptured in a cell?

- (1) Cell dies
- (2) Cell shrinks
- (3) Cell swell up
- (4) Nothing would happen

151. The figure below shows the structure of a mitochondria with its four parts labelled a, b, c and d. Select the part correctly matched with its function.



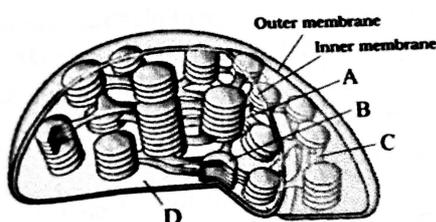
- (a) d (outer membrane) - gives rise to inner membrane by splitting
- (b) b (inner membrane)- forms infolding called cristae.
- (c) c (crista)- possess single circular DNA molecule and ribosomes
- (d) a (matrix)- major site for respiratory chain enzymes

152. The features given below are attributed to:

- (i) It contains water, sap, excretory products and other unwanted materials.
- (ii) It is bound by a single membrane called tonoplast.
- (iii) In plant cells, it can occupy up to 90% of cell volume.
- (iv) Its contain forms cell sap.
- (v) It maintains turgor pressure.

- (1) Lysosome
- (2) Vacuole
- (3) Peroxisome
- (4) Food vacuole

153. Which of the following option correctly match A, B, C and D indicated in the given sectional view of chloroplasts.



(1) a-Thylakoid, B-Stromal lamella, C-Stroma, D-Granum

(2) A-Granum, B-Thylakoid, C-Stromal lamella, D-Stroma

(3) A-Thylakoid, B-Granum, C-Stromal lamella, D-Stroma

(4) A-Granum, B-Thylakoid, C-Stroma, D-Stromal lamella

154. Which of the following pair are correctly matched?

I. Microtubules - Structural components of cilia

II. Centrioles - Store hydrolytic enzymes

III. Amyloplasts - Store oil protein and starch in plants

IV. Ribosome - Lipid synthesis

(1) I, II, III and IV

(2) I, and II

(3) I only

(4) I, II and IV

155. According to widely accepted "Fluid mosaic model" cell membranes are semi-fluid, where lipids and integral proteins can diffuse randomly. In recent years, this model has been modified in several respects. In this regard, which of the following statements is incorrect?

(1) Proteins in cell membranes can travel within the lipid bilayer.

(2) Proteins can also undergo flip-flop movements in the lipid bilayer.

(3) Proteins can remain confined within certain domains of the membrane.

(4) Many proteins remain completely embedded within the lipid bilayer.

156. Nucleolus is:

(1) Rounded structure found in cytoplasm near nucleus.

(2) Rounded structure inside nucleus and having rRNA

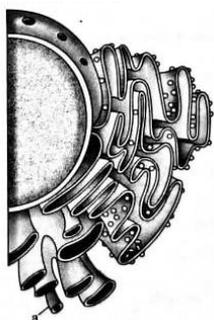
(3) Rod-shaped structure in cytoplasm near the nucleus.

(4) None of the above

157. Select the alternative given correct identification and function of the organelle 'A' in the diagram.



- (1) Endoplasmic reticulum-synthesis of lipids
 (2) Mitochondria-produce cellular energy in the form of ATP
 (3) Golgi body- Provides packaging material
 (4) Lysosomes - secrete hydrolytic enzymes
158. Which one of the following organelle in the figure correctly matches with its function?



- (1) Golgi apparatus, protein synthesis
 (2) Golgi apparatus, formation of glycolipids
 (3) Rough endoplasmic reticulum, protein synthesis
 (4) Rough endoplasmic reticulum, formation of glycoproteins.
159. Match the following and select the correct answer.

Column-I		Column-II	
A	Centriole	I	Infloding in mitochondria
B	Chlorophyll	II	Thylakoids
C	Cristae	III	Nucleic acids
D	Ribozymes	IV	Basal body of cilia or flagella

- (1) A-IV, B-II, C-I, D-III
 (2) A-I, B-II, C-IV, D-III
 (3) A-I, B-III, C-II, D-IV
 (4) A-IV, B-III, C-I, D-II
160. The solid linear cytoskeletal elements having a diameter of 6 nm and made up of single type of monomer are known as:
- (1) Microtubules
 (2) Microfilaments
 (3) Intermediate filaments
 (4) Lamins
161. Nuclear envelope is a derivative of:
- (1) Membrane of Golgi complex
 (2) Microtubules
 (3) Rough endoplasmic reticulum
 (4) Smooth endoplasmic reticulum

162. Match the columns and identify the correct option.

Column-I		Column-II	
A	Thylakoids	I	Disc-shaped sacs in Golgi apparatus
B	Cristae	II	Condensed structure of DNA
C	Cisternae	III	Flat membranous sacs in stroma
D	Chromatic	IV	Infolding in mitochondria

- (1) A-III, B-IV, C-I, D-II
 (2) A-III, B-I, C-IV, D-II
 (3) A-III, B-IV, C-II, D-I
 (4) A-IV, B-III, C-I, D-II
163. Mitochondria and chloroplast are:
- (i) Semi-autonomous organelles
 (ii) Formed by division of pre-existing organelles and they contain DNA but lack protein-synthesising machinery
- Which one of the following option is correct?
- (1) Both (i) and (ii) are correct
 (2) (ii) is true but (i) is false
 (3) (i) is true but (ii) is false
 (4) Both (i) and (ii) are false
164. The organelles that are included in the endomembrane system are:
- (1) Golgi complex, Endoplasmic reticulum, Mitochondria and Lysosomes
 (2) Endoplasmic reticulum, Mitochondria, Ribosomes and Lysosomes
 (3) Endoplasmic reticulum, Golgi complex, Lysosomes and Vacuoles
 (4) Golgi complex, Mitochondria, Ribosomes and Lysosomes
165. Match column-I with column-II.

Column-I		Column-II	
A	Cristate	I	Primary constriction in chromosome
B	Thylakoids	II	Disc-shaped sacs in Golgi apparatus
C	Centromere	III	Infoldings in mitochondria
D	Cisternae	IV	Fattended membranous sacs in stroma of Plastids

- (1) A-II, B-III, C-IV, D-I
- (2) A-IV, B-III, C-II, D-I
- (3) A-I, B-IV, C-III, D-II
- (4) A-III, B-IV, C-I, D-II

166. Given below are two statements:

Statement-I: Mycoplasma can pass through less than 1 micron filter size.

Statement-II: Mycoplasma are bacteria with cell wall.

In the light of the above statements, choose the most appropriate answer from the options given below.

- (1) Both statement I and II are incorrect
- (2) Statement I is correct but II is incorrect
- (3) Statement I is incorrect but II is correct
- (4) Both statement I and II are correct

167. Match column I with column II.

Column-I		Column-II	
A	metacentric	I	Centromere situated close to the end forming one extremely short and one very long arms
B	Acrocentric	II	Centromere at the terminal end of chromosome
C	Sub-metacentric	III	Centromere in the middle forming two equal arms of chromosome
D	Telocentric	IV	Centromere slightly away from the middle forming one shorter arm and one longer arm

- (1) A-I, B-III, C-II, D-IV
- (2) A-II, B-III, C-IV, D-I
- (3) A-I, B-II, C-III, D-IV
- (4) A-III, B-I, C-IV, D-II

168. Read the following statements and choose the correct option.

(i) Cilium / flagellum contains an outer ring of nine doublet microtubules surrounding two singlet microtubules.

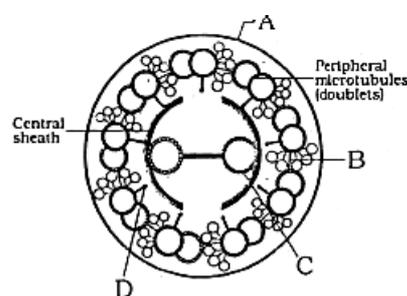
(ii) Cilia are smaller which works like oars, causing the movement of either the cells or surrounding fluid.

(ii) Flagella are comparatively longer and responsible for cell movement.

(iv) Cilia and flagellum are covered with plasma membrane.

- (1) (i) and (ii)
- (2) (i), (ii), (iii) and (iv)
- (3) (i), and (iv)
- (4) (ii) and (iii)

169. The given figure shows the diagrammatic representation of section of cilia or flagella with same parts marked as A, B, C and D. Choose the correct option for labelling of A, B, C and D marked in the figure below.



- (1) A-plasma membrane, B-Interdoublet bridge, C-Central microtubule, D-Radial spoke
- (2) A-Plasma membrane, B-Arm, C-Central microtubule, D-Radial spoke
- (3) A-Plasma membrane, B-Interdoublet bridge, C-Hub, D-Arm
- (4) A-Plasma membrane, B-Interdoublet bridge, C-Hub, D-Arm

170. Statement-I: Peripheral proteins are partially or totally buried in the membrane.

Statement-II: Integral proteins lie on the surface of membrane.

- (1) Both statement I and II are correct
- (2) Both statement I and II are incorrect
- (3) Statement I is correct but II is incorrect
- (4) Statement II is correct but I is incorrect

171. Which one of the following pairs is not correctly matched?

- (1) Cristae - The "Shelves" formed by the folding of the inner membrane of the mitochondrion
- (2) Plasmodesmata - The membrane surrounding the vacuole in plants
- (3) Grana - Membrane bound discs in chloroplasts that contain
- (4) Middle lamella - Layer between adjacent cell walls in plants derived from cell plate



172. Which of the following statements about Golgi body is/are incorrect?
(i) Varied of cisternae are present in a Golgi body.
(ii) Golgi cisternae are concentrically arranged near the nucleus.
(iii) Golgi body shows polarity - cis/proximal/ forming/ concave face near nucleus and trans/ distal/maturing/ convex face.
(iv) The cis and trans faces are interconnected.
(v) Both the face are similar.
(1) Only (iii) and (v) (2) Only (iv)
(3) Only (iv) and (v) (4) Only (iii)
173. Match the following types of vacuoles with their primary functions and identify the correctly matched pair.
(1) Contractile vacuole - Found in Amoeba, important for osmoregulation and excretion.
(2) Sap Vacuole - Found in animal cells, occupies up to 90% of the volume of the cell.
(3) Food vacuole - Found by engulfing food particles, contains only metabolic gases.
(4) Gas vacuole - Found in higher plants, helps in the storage of proteins and lipids
Direction (Qs. No.-174 to 178): These questions consists of two statements, each printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.
(1) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion
(2) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion
(3) Assertion is correct but Reason is not correct
(4) Assertion is not correct but Reason is correct
174. **Assertion:** Pili are nonmotile appendages of bacteria.
Reason: Pili take part in conjugation.
175. **Assertion:** The endomembrane system includes endoplasmic reticulum (ER), Golgi complex, lysosomes and vacuole.
Reason: Mitochondria, chloroplast and peroxisomes are not the part of endomembrane system because their functions are not coordinated with the same.
176. **Assertion:** Mitochondria are called 'power house' of the cell.
Reason: Mitochondria produce cellular energy in the form of ATP.
177. **Assertion:** The arrangement of axonemal microtubules in cilia or flagella is called 9+2 array.
Reason: The axoneme usually has nine pairs of doublets of radially arranged peripheral microtubules, and a pair of centrally located microtubules.
178. **Assertion:** Prokaryotes have a one envelope system.
Reason: There is not even a single membrane that surrounds the prokaryotic cell.
179. Read the following statements and identify the correct options.
(i) The shape of the cells may vary with the functions they perform
(ii) Human RBC is about $7.0\mu\text{m}$ in diameter
(iii) Cytoplasm is the main arena of cellular activities.
(iv) Various chemical reactions occur in cytoplasm to keep the cell in the living state.
(1) All are correct
(2) Only (i) and (ii) are correct
(3) Only (iv) is correct
(4) All are wrong
180. Identify the correct statement regarding the comparison between prokaryotic and eukaryotic cells.
(1) Prokaryotes contain a well-defined nucleus surrounded by a double membrane.
(2) The surface area available for cellular function is generally much higher in eukaryotic cells due to extensive internal membrane systems.
(3) Ribosomes are considered membrane-bound organelles found only in eukaryotes.
(4) Prokaryotic cells possess mitochondria for aerobic respiration, just like eukaryotic cells.



KIIT HIGHER SECONDARY SCHOOL



Minor Test-01 (NEET)-OA

ANSWER KEY

PHYSICS

Question No.	1	2	3	4	5	6	7	8	9	10
Answer	3	4	1	3	3	2	1	2	1	4
Question No.	11	12	13	14	15	16	17	18	19	20
Answer	2	2	3	4	4	4	3	2	1	4
Question No.	21	22	23	24	25	26	27	28	29	30
Answer	1	4	4	4	2	3	1	3	3	4
Question No.	31	32	33	34	35	36	37	38	39	40
Answer	4	2	2	3	3	4	3	4	2	4
Question No.	41	42	43	44	45					
Answer	3	3	2	1	2					

CHEMISTRY

Question No.	46	47	48	49	50	51	52	53	54	55
Answer	3	1	3	1	2	3	1	2	2	4
Question No.	56	57	58	59	60	61	62	63	64	65
Answer	1	3	1	1	4	2	4	2	1	3
Question No.	66	67	68	69	70	71	72	73	74	75
Answer	1	4	1	4	4	4	3	4	4	4
Question No.	76	77	78	79	80	81	82	83	84	85
Answer	2	2	4	2	3	2	2	3	4	1
Question No.	86	87	88	89	90					
Answer	4	1	3	4	1					

BIOLOGY

Question No.	91	92	93	94	95	96	97	98	99	100
Answer	3	2	1	3	3	1	3	4	3	4
Question No.	101	102	103	104	105	106	107	108	109	110
Answer	1	2	1	1	1	1	1	4	3	2
Question No.	111	112	113	114	115	116	117	118	119	120
Answer	2	3	2	1	1	2	4	3	2	4
Question No.	121	122	123	124	125	126	127	128	129	130
Answer	1	4	4	4	2	4	2	1	4	4
Question No.	131	132	133	134	135					
Answer	2	2	1	4	2					

BIOLOGY

Question No.	136	137	138	139	140	141	142	143	144	145
Answer	2	4	4	3	1	2	3	2	1	3
Question No.	146	147	148	149	150	151	152	153	154	155
Answer	2	4	1	1	1	2	2	2	3	2
Question No.	156	157	158	159	160	161	162	163	164	165
Answer	2	2	3	1	2	3	1	3	3	4
Question No.	166	167	168	169	170	171	172	173	174	175
Answer	2	4	2	1	2	2	1	1	2	2
Question No.	176	177	178	179	180					
Answer	1	1	3	1	2					