27/08/2025

Code-B_Phase-2

Aakash
Medical|IIT-JEE|Foundations

Corporate Office : AESL, 3rd Floor, Incuspaze Campus-2, Plot No. 13, Sector-18, Udyog Vihar, Gurugram, Haryana - 122015, *Ph.*+91-1244168300

MM : 720

NCERT Booster Test Series for NEET-2026_RM(P2)_NBTS-01B

Time : 180 Min.

Topics Covered:
Physics: Units & Measurements, Motion in a Straight Line, Motion in a Plane, Laws of Motion, Work, Energy & Power, System of Particles & Rotational Motion
Chemistry: Some Basic Concepts of Chemistry, Structure of Atom, Classification of Elements and Periodicity in Properties, Chemical Bonding and Molecular Structure
Botany: Cell : The Unit of Life, Cell Cycle & Cell Division, The Living World, Biological Classification
Zoology: Structural Organisation in Animals– Animal Tissues, Biomolecules, Breathing & Exchange of Gases, Body Fluids & Circulation

General Instructions :
Duration of Test is 3 hrs.
The Test consists of 180 questions. The maximum marks are 720.
There are four parts in the question paper consisting of Physics, Chemistry, Botany and Zoology having 45 questions in each part of equal weightage.
Each question carries +4 marks. For every wrong response, –1 mark shall be deducted from the total score. Unanswered/unattempted questions will be given no marks.
Use blue/black ballpoint pen only to darken the appropriate circle.
Mark should be dark and completely fill the circle.
Dark only one circle for each entry.
Dark the circle in the space provided only.
Rough work must not be done on the Answer sheet and do not use white fluid or any other rubbing material on the Answer sheet.

PHYSICS

1. In equation $y = x^2 \cos^2 2\pi \frac{\beta t}{\alpha}$, the units of x, α, β are m, s^{-1} and $(m\,s^{-1})^{-1}$ respectively. The units of y and γ are

(1) $m^2, m\,s^{-2}$

(2) $m, m\,s^{-1}$

(3) m^2, m

(4) $m, m\,s^{-2}$

2. If length and breadth of a rectangle are l = (10.0 ± 0.2) m and b = (15.0 ± 0.9) m, then maximum percentage error in its area is

(1) 2%

(2) 4%

(3) 8%

(4) 6%

3. Consider the given statements
Statement A: Measured value by any measuring instrument has some error.
Statement B: A measurement can have more accuracy and less precision and vice-versa.
Statement C: The magnitude of the difference between the true value of the quantity and the individual measured value is called relative error of measurement.
Choose the correct option.

(1) Only statement A is true

(2) Only statement B is true

(3) Both statements A and C are true

(4) Both statements A and B are true

4. A student measured the diameter of a small steel ball using a screw gauge of least count 0.002 cm. The main scale reading is 6 mm and 28 divisions of circular scale coincides with the reference level. If screw gauge has a zero error of – 0.006 cm, the correct diameter of ball is

(1) 0.529 cm

(2) 0.661 cm

(3) 0.662 cm

(4) 0.665 cm

5. If momentum [P], area [A] and time [T] are taken as fundamental quantities, then the dimensional formula for energy is

(1) $[PA^{1/2}T^{-1}]$

(2) $[P^{-1}A^{1/2}T^{1}]$

(3) $[P^{-1}A^{-1/2}T^{1}]$

(4) $[P^{-1}A^{1/2}T^{-1}]$

6. A torque meter is calibrated to reference standards of mass, length and time, each with 3% error. After calibration, the measured torque with this torque meter will have maximum percentage error of (Unit of torque is N m)

(1) 10%

(2) 15%

(3) 20%

(4) 25%

7. A car travels the half of distance of its journey with a speed of 40 km/h and the second half of the distance with speed v. If the average speed of car is 48 km/h then the value of v is

(1) 62 km/h

(2) 44 km/h

(3) 60 km/h

(4) 56 km/h

8. Two trains P and Q each of length 100 m are moving on parallel tracks at 72 kmph and 90 kmph respectively in the same direction. Initially Q is 1 km behind P. Time after which Q completely overtakes P is

(1) 245 minute

(2) 4 minute

(3) 4 second

(4) 4 hour

9. A boat takes two hours to travel 8 km down and 8 km up the river when the water is still. How much time will boat take to make the same trip when the water is flowing at the rate of 4 km/h?

(1) 2 hour

(2) 2 hour 20 minute

(3) 3 hour

(4) 2 hour 40 minute

10. A ball projected from ground vertically upward is at same height at time t_1 and t_2. The speed of projection of ball is [Neglect the effect of air resistance]

(1) $g[t_2 - t_1]$

(2) $\frac{g[t_1 + t_2]}{2}$

(3) $\frac{g[t_2 - t_1]}{2}$

(4) $g[t_1 + t_2]$

11. The position of a particle along x-axis at time t is given by $x = 1 + t - t^2$. The distance travelled by the particle in first 2 seconds is

(1) 1 m

(2) 2 m

(3) 2.5 m

(4) 3 m

12. An elevator of cabin height 1.2 m starts ascending with acceleration 2 m/s^2. One second after the start a loose bolt starts falling from the ceiling. The time after which bolt will hit the floor of elevator is (g = 10 m/s^2)

(1) $\frac{1}{\sqrt{5}}$ s

(2) $\frac{\sqrt{5}}{5}$ s

(3) 5 s

(4) $\frac{1}{\sqrt{2}}$ s

13. The maximum acceleration or deceleration that a train may have is a. The minimum time in which the train can get from one station to the next station at a distance S is

(1) $\sqrt{\frac{2S}{a}}$

(2) $\frac{1}{2}\sqrt{\frac{S}{a}}$

(3) $2\sqrt{\frac{S}{a}}$

(4) $\sqrt{\frac{S}{a}}$

14. Consider the following statements regarding a vector $\vec{P}$.

(a) Multiplication of vector $\vec{P}$ with a positive scalar will change the direction.

(b) Multiplication of vector $\vec{P}$ with a negative scalar will change the direction.

(c) Rotation of vector $\vec{P}$ by angle θ will change the direction.

(d) Translation of vector $\vec{P}$ will change its magnitude.

Based on above statements, the correct statement is

(1) Only (b)

(2) Only (c)

(3) Both (b) and (c)

(4) Both (c) and (d)

15. Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion (A) : For unit vectors $\hat{i}$ and $\hat{j}$, $\left(\hat{i}+\hat{j}\right)=1$

Reason (R) : Sum of two unit vectors is also a unit vector.

(1) Both (A) and (R) are true and (R) is the correct explanation of (A)

(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

16. Centripetal acceleration is

(1) A constant vector

(2) A constant scalar

(3) A magnitude changing vector

(4) A direction changing vector having constant magnitude

17. Consider the two statements related to circular motion in usual notations.

Statement I : In non-uniform circular motion $\vec{\omega}$, $\vec{v}$ and $\vec{a}$ are always mutually perpendicular.

Statement II : In uniform circular motion $\vec{v}$, $\vec{r}$ and $\vec{a}$ are always mutually perpendicular.

(1) Both statements are true

(2) Both statements are false

(3) Statement I is true but statement II is false

(4) Statement II is true but statement I is false

18. For the equation of trajectory of a projectile, $y=\sqrt{3}x-\frac{gx^2}{2}$ (y and x are in metre), the angle of projection (from the horizontal) and the speed of projection respectively are [y is vertically upwards]

(1) 30°, 1 m/s

(2) 60°, 2 m/s

(3) 60°, 1 m/s

(4) 30°, 2 m/s

19. A projectile is projected with speed 20 m/s at 60° with horizontal. Its horizontal range is

(1) $10\sqrt{2}$ m

(2) $20\sqrt{3}$ m

(3) $\frac{20}{\sqrt{3}}$ m

(4) $10\sqrt{3}$ m

20. Two vectors, $\vec{P}=2\hat{i}-\hat{j}+3\hat{k}$ and $\vec{Q}=-\hat{i}-\hat{j}-\hat{k}$, are added. A vector having magnitude equal to the magnitude of resultant vector and parallel to the $\vec{Q}$ is

(1) $-3\hat{i}-3\hat{j}-3\hat{k}$

(2) $-\sqrt{3}\hat{i}-\sqrt{3}\hat{j}-\sqrt{3}\hat{k}$

(3) $2\sqrt{3}\hat{i}-\sqrt{3}\hat{j}+3\sqrt{3}\hat{k}$

(4) $-\frac{\hat{i}}{\sqrt{3}}-\frac{\hat{j}}{\sqrt{3}}-\frac{\hat{k}}{\sqrt{3}}$

21. In a circular motion, the angle between the acceleration and velocity may be

(1) 90°

(2) Acute

(3) Obtuse

(4) All of these

22. The coefficient of static friction between a block and an inclined plane is $\sqrt{3}$. The angle of repose is

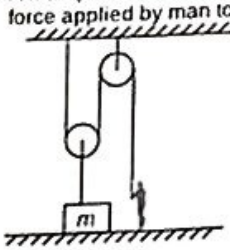
(1) 30°

(2) 60°

(3) 45°

(4) 53°

23. A man pulls the string as shown in figure, then the minimum force applied by man to just lift the block will be



(1) mg

(2) $\frac{mg}{4}$

(3) $\frac{mg}{2}$

(4) $2mg$

24. Consider the following statements.
Statement A : Coefficient of friction between any two bodies in contact depends on the nature of material of the surfaces in contact.
Statement B : Kinetic friction is a self-adjusting force.
Based upon above information, pick the correct option.

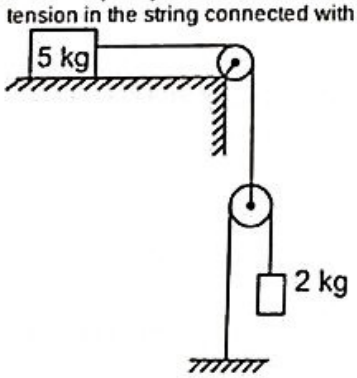
(1) Statement A is true but B is false

(2) Statement A is false but B is true

(3) Both the statements are true

(4) Both the statements are false

25. If all the pulleys are massless and strings are ideal then tension in the string connected with 2 kg block is



(1) 12 N

(2) $\frac{100}{13}$ N

(3) 200 N

(4) Zero

26. A machine gun fires 10 bullets per second with speed 10 m/s. If mass of each bullet is 300 gm, then the force required to keep the gun stationary is

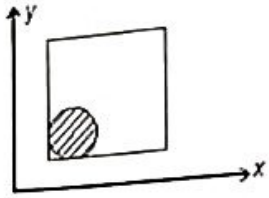
(1) 40 N

(2) 10 N

(3) 20 N

(4) 30 N

27. A solid sphere of mass 2 kg is resting inside a hollow cube as shown in the figure given below. The cube is moving in a horizontal plane with velocity $\vec{v} = \left(3t\hat{i} + 4t\hat{j}\right)\ ms^{-1}$, where t is in seconds. The sphere is at rest with respect to the cube. The magnitude of force exerted by the cube on the sphere is



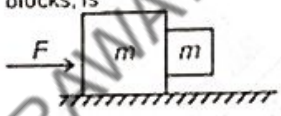
(1) 5 N

(2) 7 N

(3) 10 N

(4) 14 N

28. The system of two blocks as shown in figure, below is pushed by a horizontal force F on a smooth horizontal surface. The coefficient of friction between blocks is μ. The minimum force F required to prevent slipping between the blocks, is



(1) $\frac{2mg}{\mu}$

(2) $\frac{5mg}{2\mu}$

(3) $\frac{3mg}{2\mu}$

(4) $\frac{3}{2}\mu mg$

29. A parabolic bowl with its bottom at origin has the shape, $y = \frac{x^2}{20}$, where x and y are in metre.The maximum height at which a small mass m can be placed on the bowl without slipping is (coefficient of static friction $\mu = 0.5$ and $g = 10\ m/s^2$)

(1) 1.25 m

(2) 2.5 m

(3) 1.0 m

(4) 2.0 m

30. The speed of a body revolving in a vertical circle of radius 'r' at the lowest point is $\sqrt{5gr}$. The tension in the string at the upper most position will be

(1) mg

(2) $3\ mg$

(3) $5\ mg$

(4) Zero

31. In a perfectly elastic collision between two masses m_1 and m_2 in one dimension, energy transfer is maximum when (m_2 is at rest initially)

(1) $m_1 = 2m_2$

(2) $m_1 << m_2$

(3) $m_1 >> m_2$

(4) $m_1 = m_2$

32. A spring of spring constant 500 N/m is stretched initially by 5 cm from unstretched position. Then work required to stretch it further by another 5 cm is

(1) 1.25 J

(2) 2.5 J

(3) 1.875 J

(4) 6.25 J

33. A scooter of 40 kg mass moving with velocity 36 km/h collides with another scooter of 60 kg mass and moving with velocity 18 km/h in same direction. After collision the two scooters stick together, the velocity of the scooters after collision is (in m/s)

(1) 140.4

(2) 25.2

(3) 7

(4) 4

34. Efficiency of a water pump is 80% and it lifts 25 kg water per second to 8 m height. The power consumed by pump is

(1) 2.5 kW

(2) 2.0 kW

(3) 1.6 kW

(4) 2.4 kW

35. The potential energy of a particle at position x is given by $U = (x^2 - 4x + 2)\ J$, where x is in meter. The equilibrium position of the particle will be

(1) $x = 2$ m

(2) $x = 0$

(3) $x = 1$ m

(4) $x = 3$ m

36. The potential energy of mass m is given by $U = \frac{1}{2}kx^2$ for $x < 0$ and $U = 0$ for $x \geq 0$. Considering only conservative forces, if total mechanical energy of the particle is E, its speed at $x = \sqrt{\frac{2E}{k}}$ is

(1) Zero

(2) $\sqrt{\frac{2E}{m}}$

(3) $\sqrt{\frac{5E}{m}}$

(4) $\sqrt{\frac{3E}{2m}}$

37. Assume the aerodynamic drag force on a car is proportional to its speed. If the power output from the engine is doubled, then maximum speed of the car

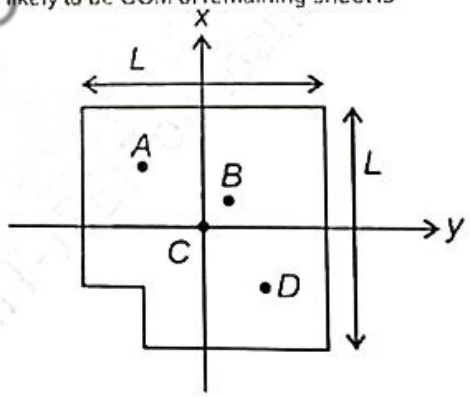
(1) Is unchanged

(2) Increases by a factor of $\sqrt{2}$

(3) Is also doubled

(4) Increases by a factor of four

38. A uniform square sheet of side L is placed in xy plane with its centre at origin. Now a square section of size $\frac{L}{4}$ is removed from the sheet as shown. The point which is more likely to be COM of remaining sheet is



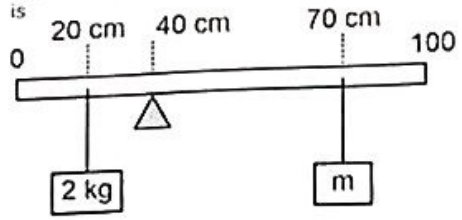
(1) A

(2) B

(3) C

(4) D

39. A uniform rod of length 100 cm and mass 400 g is balanced on a wedge placed at 40 cm mark. A mass of 2 kg is suspended from the rod at 20 cm and another unknown mass m is suspended from the rod at 70 cm as shown in the figure. Value of mass 'm' such that the rod is in equilibrium, is



(1) 3.4 kg

(2) 1.8 kg

(3) 2.8 kg

(4) 1.2 kg

40. A thin circular ring of mass M and radius R is rotating in a horizontal plane about an axis passing through its centre and perpendicular to its plane with angular velocity 'ω'. If a disc of same radius but half mass is placed gently on the ring co-axially, then the new angular velocity of the system is

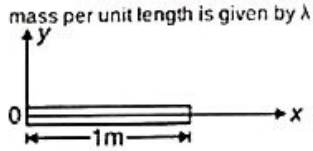
(1) $\frac{3}{4}\omega$

(2) $\frac{2}{3}\omega$

(3) $\frac{4}{3}\omega$

(4) ω

41. The centre of mass of the straight rod given below if its mass per unit length is given by $\lambda = (3x)$ kg m^{-1}, will be at



(1) $x = \frac{1}{2}$ m

(2) $x = \frac{2}{3}$ m

(3) $x = \frac{3}{4}$ m

(4) $x = 1$ m

42. If two vector is given as $\vec{A} = \hat{i} - 2\hat{j} + 6\hat{k}$ and $\vec{B} = \hat{i} - 2\hat{j} + \hat{k}$, then the vector product $(\vec{A} \times \vec{B})$ will be equal to

(1) $5\hat{i} + 10\hat{j}$

(2) $5\hat{i} - 10\hat{j}$

(3) $10\hat{i} + 5\hat{j}$

(4) $10\hat{i} - 5\hat{j}$

43. A particle of mass 2 kg moving along line $y = 2x + 1$ with speed 20 m/s. Find angular momentum of the particle about origin.

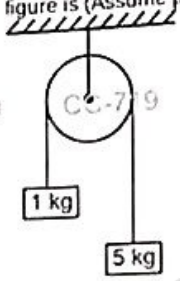
(1) $6\sqrt{5}$ kg m^2 s^{-1}

(2) $5\sqrt{5}$ kg m^2 s^{-1}

(3) $8\sqrt{5}$ kg m^2 s^{-1}

(4) $4\sqrt{5}$ kg m^2 s^{-1}

44. The acceleration of centre of mass of system shown in the figure is (Assume pulley and strings are ideal)



(1) $\frac{2g}{9}$

(2) Zero

(3) $\frac{4g}{9}$

(4) g

45. Column-I states some conservation laws in mechanics while Column-II states some events. Match the laws from Column-I with the events from Column-II in which they holds good and choose the correct option.

	Column-I		Column-II
(A)	Law of conservation of linear momentum	(P)	Ballet dancer dancing on smooth floor
(B)	Law of conservation of mechanical energy	(Q)	Recoiling of gun in case of firing
(C)	Law of conservation of angular momentum	(R)	Body falling freely under gravity

(1) (A) → (P), (B) → (R), (C) → (Q)

(2) (A) → (Q), (B) → (P), (C) → (R)

(3) (A) → (Q), (B) → (R), (C) → (P)

(4) (A) → (R), (B) → (P), (C) → (Q)

CHEMISTRY

46. If a 20 watt bulb emits monochromatic light of wavelength 1980 nm then the number of photons emitted per second by the bulb will be ($h = 6.6 \times 10^{-34}$ Js)

(1) 6×10^{21}

(2) 4×10^{18}

(3) 2×10^{20}

(4) 8×10^{22}

47. The pair of molecules which have see-saw shape is

(1) XeF_4 and SF_4

(2) XeO_2F_2 and SF_4

(3) $XeOF_4$ and XeF_4

(4) XeO_2F_2 and XeF_4

48. Consider the following sets of quantum number

	n	l	m	s
(a)	2	1	0	$+\frac{1}{2}$
(b)	3	2	1	$-\frac{1}{2}$
(c)	4	4	2	$+\frac{1}{2}$
(d)	3	1	−2	$+\frac{1}{2}$
(e)	5	2	3	$-\frac{1}{2}$

The set of quantum numbers which are not possible are

(1) (a), (b) and (d) only

(2) (b), (c) and (e) only

(3) (c), (d) and (e) only

(4) (b), (c), (d) and (e) only

49. Which of the given molecules has the highest percentage of *d*-character in the hybrid orbital of central atom?

(1) SF_6

(2) XeF_6

(3) XeF_4

(4) BrF_5

50. Electronic configuration of most electronegative element is

(1) $1s^2 2s^2 2p^5$

(2) $1s^2 2s^2 2p^6 3s^2 3p^4$

(3) $1s^2 2s^2 2p^6 3s^2 3p^5$

(4) $1s^2 2s^2 2p^3$

51. Consider the following statements

(a) Bohr's theory can be applied to Be^{3+} ion

(b) Lyman series of hydrogen atom falls in ultraviolet region

(c) Angular momentum of electron in third Bohr orbit is $\frac{3h}{\pi}$

The correct statements are

(1) (a) and (c) only

(2) (a) and (b) only

(3) (a), (b) and (c)

(4) (b) and (c) only

52. 14.0 g of N_2 has same number of molecules as in

(1) 32 g of O_2

(2) 2 g of H_2

(3) 32 g of CH_4

(4) 22 g of CO_2

53. Number of σ-bonds and π-bonds in the given molecule respectively are

$CH_3 - CH = CH - C \equiv C - CHO$

(1) 12 and 3

(2) 14 and 3

(3) 12 and 4

(4) 13 and 4

54. Orbital angular momentum of the electron present in a 3*d* orbital is

(1) Zero

(2) $2\sqrt{3}\,\hbar$

(3) $\sqrt{2}\,\hbar$

(4) $\sqrt{6}\,\hbar$

55. Consider the following statements.

(i) PCl_5 has trigonal bipyramidal shape.

(ii) The equatorial bonds in PCl_5 are longer than those of the axial bonds.

(iii) 90° bond angle (Cl – P – Cl) in PCl_5 is absent.

Choose the incorrect statement.

(1) (i) only

(2) (ii) and (iii) only

(3) (ii) only

(4) (i), (ii) and (iii)

56. Consider the following statements about cathode rays
(a) The characteristics of cathode rays depend upon the nature of the gas present in cathode ray tube.
(b) These rays start from cathode and move towards the anode.
(c) Television picture tubes are cathode ray tubes.
The correct statement(s) is/are

(1) (a) and (b) only

(2) (b) and (c) only

(3) (a), (b) and (c)

(4) (c) only

57. According to VSEPR theory, the repulsive interaction of electron pairs decreases in the order of

(1) Lone pair – Lone pair > Bond pair – Bond pair > Bond pair – Lone pair

(2) Bond pair – Bond pair > Bond pair – Lone pair > Lone pair – Lone pair

(3) Lone pair – Lone pair > Lone pair – Bond pair > Bond pair – Bond pair

(4) Bond pair – Lone pair > Lone pair – Lone pair > Bond pair – Bond pair

58. XeF_2 has same shape as

(1) H_2O

(2) SO_2

(3) $I_3^{\ominus}$

(4) BF_3

59. Radius of second Bohr orbit of He^+ is

(1) 1.06 Å

(2) 0.53 Å

(3) 1.59 Å

(4) 0.79 Å

60. Number of angular nodes and radial nodes in 5*p* orbital are

(1) 1 and 3

(2) 1 and 4

(3) 2 and 3

(4) 2 and 4

61. Match the column I containing diatomic molecules with the respective type of bonds present in them.

Column I	Column II
(a) B_2	(i) 2 π bonds only
(b) N_2	(ii) 1 σ and 1 π bond
(c) C_2	(iii) 1 σ and 2 π bonds
(d) O_2	(iv) 1 π bond only

Choose the correct option.

(1) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

(2) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

(3) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

(4) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

62. Number of molecules of oxygen present in 56 L of air at STP is (Given: Air contains 20% oxygen by volume)

(1) 1.2×10^{24}

(2) 4.2×10^{25}

(3) 6.02×10^{24}

(4) 3.01×10^{23}

63. Which of the following given statements about resonance is incorrect?

(1) Resonance stabilises the molecule

(2) Energy of any canonical structure is always less than that of resonance hybrid

(3) Resonance averages the bond characteristics as a whole

(4) The canonical forms have similar energy and position of nuclei

64. Octet rule is not violated in

(1) SCl_2

(2) NO_2

(3) PCl_5

(4) SF_6

65. An organic compound contains carbon, hydrogen and oxygen. Its elemental analysis gave C, 38.71% and H, 9.67%. The empirical formula of the compound would be

(1) CH_3O

(2) CH_4O

(3) CHO

(4) CH_2O

66. From 220 mg of CO_2. 10^{21} molecules of CO_2 are removed. Number of remaining molecules of CO_2 will be

(1) 3.011×10^{21}

(2) 2.011×10^{21}

(3) 1.011×10^{21}

(4) 6.022×10^{21}

67. If a particle of mass 2 mg is moving with a velocity of 600 ms^{-1} then the de-Broglie wavelength of the moving particle will be ($h = 6.6 \times 10^{-34}$ Js)

(1) 5.5×10^{-34} m

(2) 5.5×10^{-31} m

(3) 1.2×10^{-32} m

(4) 1.2×10^{-33} m

68. What mass of 90% pure $CaCO_3$ will be required to neutralise 40 mL of 0.5 M HCl solution according to the following reaction?
$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$

(1) 2.28 g

(2) 4.56 g

(3) 3.22 g

(4) 1.11 g

69. Consider the following two statements.
Statement I: Magnitude of H-bonding is maximum in solid state and minimum in gaseous state.
Statement II: Intermolecular H-bonding is present in o-nitrophenol molecule.
In the light of above statements choose the **correct** option.

(1) Both statement I and statement II are correct

(2) Both statement I and statement II are incorrect

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

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

70. If the mass percentage of Mg in a biomolecule is 0.2%, then the minimum possible molecular weight of biomolecule will be

(1) 24000 u

(2) 36000 u

(3) 12000 u

(4) 48000 u

71. Average atomic mass of an element (A) having two isotopes ^{10}A and ^{12}A with percentage abundance 80% and 20% respectively is

(1) 10.8 u

(2) 10.4 u

(3) 11.4 u

(4) 11.8 u

72. Correct order of ionization enthalpy is

(1) Li < Be < B < C < N < O

(2) B < Be < Li < O < C < N

(3) Li < B < Be < C < N < O

(4) Li < B < Be < C < O < N

73. Select the **incorrect** statement regarding Dalton's atomic theory

(1) Matter consists of indivisible atoms

(2) All atoms of a given element have identical properties

(3) Compounds are formed when atoms of different elements combine in fixed ratio

(4) Atoms are created or destroyed in chemical reactions

74. The ratio of energy of photons of 200 nm wavelength radiation to that of 800 nm radiation is

(1) 1 : 2

(2) 4 : 1

(3) 8 : 1

(4) 2 : 1

75. Which among the following species does not contain 180° bond angle?

(1) XeF_2

(2) H_2S

(3) C_2H_2

(4) XeF_4

76. Element with highest negative electron gain enthalpy is

(1) Cl

(2) F

(3) O

(4) S

77. Given below are the two statements.
Statement I: In OF_2 molecule, oxidation state of oxygen is +2.
Statement II: In Na_2O, the oxidation state of oxygen is –2.
In the light of above statements, choose the correct answer.
(1) Both statement I and statement II are correct
(2) Both statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct

78. Match the elements given in column-I with their electronic configuration given in column-II.

Column-I	Column-II
a. V	(i) $[Ar]3d^5 4s^2$
b. Sc	(ii) $[Ar]3d^3 4s^2$
c. Mn	(iii) $[Ar]3d^6 4s^2$
d. Fe	(iv) $[Ar]3d^1 4s^2$

Choose the correct option.
(1) a(ii), b(iv), c(iii), d(i)
(2) a(iv), b(ii), c(i), d(iii)
(3) a(iv), b(ii), c(iii), d(i)
(4) a(ii), b(iv), c(i), d(iii)

79. Total number of electrons present in 10 g of O_2^{2-} ion is approximately
(1) 5.6 N_A
(2) 6.4 N_A
(3) 4.5 N_A
(4) 5 N_A

80. Choose the species with different magnetic behaviour and same number of electrons in antibonding molecular orbital.
(1) N_2^+ and C_2^-
(2) N_2 and O_2^{2+}
(3) N_2^+ and C_2^{2-}
(4) O_2 and C_2

81. Which one of the following is a metalloid?
(1) P
(2) Ga
(3) Be
(4) Ge

82. Suppose the elements X and Y combine to form two compounds XY and X_2Y_3. When 0.1 mol of XY weighs 10 g and 0.05 mole of X_2Y_3 weighs 12 g, then the atomic weights of X and Y respectively are
(1) 50, 50
(2) 20, 80
(3) 60, 40
(4) 30, 70

83. During change of C_2 to C_2^- ion, the electron adds on to which one of the following orbitals?
(1) σ orbital
(2) π orbital
(3) π* orbital
(4) σ* orbital

84. Which of the following species has correct order of covalent bond length?
(1) C – C > C – O > C – H > O – H
(2) C – C > C – O > O – H > C – H
(3) C – O > C – C > C – H > O – H
(4) C – O > C – C > O – H > C – H

85. Match the given Column I and Column II.

Column I (Element)	Column II (Atomic number)
(a) Mendelevium	(i) 104
(b) Nobelium	(ii) 103
(c) Lawrencium	(iii) 102
(d) Rutherfordium	(iv) 101

Choose the correct match.
(1) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
(2) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
(3) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
(4) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

86. Element with atomic number 44 belongs to
(1) Group-7 and 6^{th} period
(2) Group-6 and 5^{th} period
(3) Group-8 and 5^{th} period
(4) Group-9 and 6^{th} period

87. The inert gas which has highest value of electron gain enthalpy is
(1) Xe
(2) Rn
(3) Ar
(4) Ne

88. Given below are the two statements
Statement I : Azimuthal quantum number defines the three-dimensional shape of the orbital.
Statement II : For *f* orbital the value of Azimuthal quantum number (*l*) is 4.
In light of above statements, choose the correct answer

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

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

(3) Both statement I and statement II are correct

(4) Both statement I and statement II are incorrect

89. Given below are the two statements
Statement I : Heisenberg's uncertainty principle rules out the existence of definite paths or trajectories of electrons and other similar particles.
Statement II : The effect of Heisenberg's uncertainty principle is significant both for the motion of microscopic objects as well as macroscopic objects.
In light of above statements, choose the correct answer

(1) Both statement I and statement II are correct

(2) Both statement I and statement II are incorrect

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

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

90. Consider the following statements:
Statement I: Ethanol is soluble in water.
Statement II: Ethanol forms intramolecular hydrogen bond.
In the light of above statements, choose the correct answer from the options given below.

(1) Both statement I and statement II are correct

(2) Both statement I and statement II are incorrect

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

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

BOTANY

91. The subunits of structure which is the site of protein synthesis in prokaryotes are

(1) 50S and 30S

(2) 60S and 40S

(3) 50S and 60S

(4) 30S and 40S

92. The structure of centriole differs from cilia as the former
a. Has cartwheel like appearance
b. Has 9 + 2 arrangement of axonemal microtubules
c. Is involved in the formation of spindle microtubules
d. Has central proteinaceous region called hub
e. Is surface structure involved in cell motility
The correct ones are

(1) a, c and e only

(2) b, d and e only

(3) a, c and d only

(4) a, d and e only

93. Which of the following events marks the start of the metaphase?

(1) Movement of chromosomes to the spindle equator

(2) Begining of condensation of chromatin material

(3) Complete disintegration of the nuclear envelope

(4) Duplication of centrosome

94. The function of fimbriae in bacteria is

(1) To help in attaching to host tissue or to rocks

(2) Motility

(3) DNA replication

(4) Secretion process

95. The chromosomes that have satellite

(1) Lack primary constriction

(2) Have secondary constriction

(3) Do not undergo replication

(4) Are always telocentric

96. Golgi body is involved mainly in

(1) Muscle contraction

(2) Forming precursors of enzymes of mitochondria

(3) Synthesis of steroids

(4) Packaging and transport of materials

97. The membranous extensions found in cytoplasm of cyanobacteria and purple bacteria that contain pigments are

(1) Mesosomes

(2) Glycocalyx

(3) Polysomes

(4) Chromatophores

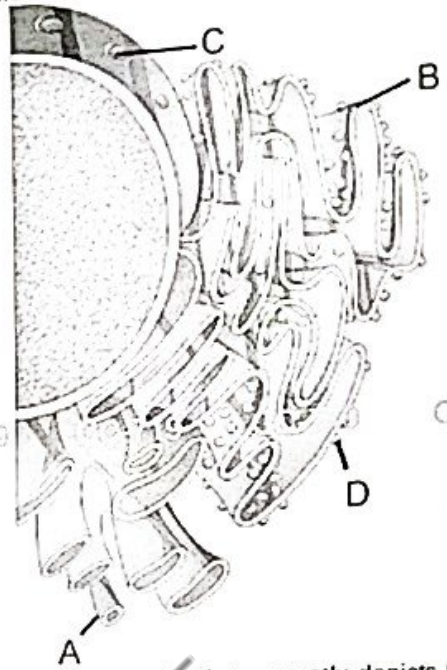
98. In *Amoeba*, the contractile vacuole is/can
(1) Usually formed by engulfing the food particles
(2) Occupy upto 90% of the cell volume
(3) Important for osmoregulation and excretion
(4) Provide buoyancy to the cell

99. Choose the **incorrectly** matched pair.
(1) Schwann – Presence of cell wall is unique character of the plant cells
(2) Schleiden – Reported that cells had a thin outer layer *i.e.* plasma membrane
(3) Rudolf Virchow – Explained that cells divide and new cells are formed from pre-existing cells.
(4) Schwann – Proposed the hypothesis that the bodies of animals and plants are composed of cells and products of cells

100. Anaphase I of meiosis is different from anaphase of mitosis, as it shows
(1) Alignment of chromosomes at the equator
(2) Separation of homologous chromosomes towards the opposite poles
(3) Separation of sister chromatids towards the opposite poles
(4) Attachment of spindle fibres from opposite poles to the kinetochores of sister chromatids

101. Mitochondria and chloroplast are not included in the endomembrane system because
(1) They are double membrane bound organelles
(2) They are involved in the production of energy in the cell
(3) They have smaller ribosomes as compared to other organelles
(4) Their functions are not coordinated with other endomembrane organelles

102. Observe the following figure.



Select the option that **correctly** depicts the labels given in the figure.
(1) Label A – It is extensive and continuous with the outer membrane of the nucleus.
(2) Label B – It synthesises lipid-like steroidal hormones in animal cells
(3) Label C – It provides the passage through which movement of RNA and protein molecules takes place in both directions between the nucleus and the cytoplasm.
(4) Label D – It is a glycolipid.

103. In plants, secondary cell wall is formed
(1) Inside the cell membrane
(2) Towards the outerside of the primary cell wall
(3) Between the primary cell wall and plasma membrane
(4) Between the primary cell walls of two adjacent cells

104. The quasi-fluid nature of plasma membrane is due to
(1) Proteins
(2) Phospholipids
(3) Oligosaccharides
(4) Transmembrane proteins

105. If a diploid plant cell carries 16 chromosomes. What will be the number of tetrads during its pachytene stage?
(1) 16
(2) 8
(3) 32
(4) 4

106. Find the correct match.

(1)	Metacentric chromosome	–	Centromere forming two unequal arms of chromosome
(2)	Telocentric chromosome	–	Centromere close to its end
(3)	Acrocentric chromosome	–	Terminal centromere
(4)	Sub-metacentric chromosome	–	Centromere slightly away from middle

(1) (1)

(2) (2)

(3) (3)

(4) (4)

107. How many cycles of nuclear division and DNA replication, respectively occur for one meiotic division?

(1) Two, two

(2) One, two

(3) Two, one

(4) Three, two

108. Arrange the following events of meiosis in **correct** sequence:
(a) Formation of X-shaped structures.
(b) Sister chromatids remain associated at their centromeres.
(c) Formation of dyad of cells.
(d) Chromosomes start pairing together.

(1) (a), (b), (c), (d)

(2) (d), (b), (a), (c)

(3) (a), (d), (b), (c)

(4) (d), (a), (b), (c)

109. Interphase

(1) Involves DNA replication

(2) Constitute less than 50% duration of the cell cycle

(3) Is the phase of actual cell division

(4) Does not include RNA formation

110. A cell in quiescent stage is

(1) Non-proliferating

(2) Metabolically inactive

(3) Actively dividing

(4) A meristematic cell in plants

111. Read the following statements and mark them as true (T) or false(F)
a. *Euglena* is a chemosynthetic autotroph.
b. Body of slime mould, move along decaying twigs and leaves, engulfing organic material.
c. In members of basidiomycetes, sexual spores are endogenously produced in the basidiocarps.
d. Viroids are found to be free RNA and cause potato spindle tuber disease.
Select the **correct** answer from following options.

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

(1) (1)

(2) (2)

(3) (3)

(4) (4)

112. Properties of tissues are

(1) Identical as that of its constituent cells

(2) Similar to the properties of cellular organelles of constituent cells

(3) The result of interaction among the constituent cells

(4) The result of interaction among the molecular components comprising the organelle

113. Family which includes genera *Felis* and *Panthera* is

(1) Muscidae

(2) Felidae

(3) Canidae

(4) Convolvulaceae

114. The phase of actual cell division is called

(1) Interphase

(2) M-phase

(3) G_1 phase

(4) S-phase

115. Read the following Assertion (A) and Reason (R) statements and select the **correct** option.
Assertion (A): Meiotic division involves recombination of genetic material.
Reason (R): Crossing over occurs between sister chromatids of homologous chromosomes during meiosis I.

(1) Both (A) and (R) are true and (R) is the correct explanation of (A)

(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

116. Choose the **correct** sequence w.r.t. stages of karyokinesis

(1) Prophase → Telophase → Anaphase → Metaphase

(2) Prophase → Anaphase → Metaphase → Telophase

(3) Prophase → Metaphase → Telophase → Anaphase

(4) Prophase → Metaphase → Anaphase → Telophase

117. The best stage to study morphology of chromosomes is

(1) Prophase

(2) Anaphase

(3) Metaphase

(4) Telophase

118. Syncytium formation is due to

(1) Failure of karyokinesis after cytokinesis

(2) Failure of cytokinesis after karyokinesis

(3) Failure of both karyokinesis and cytokinesis

(4) Occurrence of cytokinesis after karyokinesis

119. Bivalent chromosomes clearly appear as tetrads in

(1) Leptotene

(2) Zygotene

(3) Diplotene

(4) Pachytene

120. Most of the cell organelles duplicate in

(1) M phase

(2) G_1 phase

(3) G_2 phase

(4) S phase

121. Systematics differs from taxonomy as it includes

(1) Classification

(2) Nomenclature

(3) Identification

(4) Phylogeny

122. Match column I with column II and select the **correct** option.

	Column I		Column II
a.	Diakinesis	(i)	Formation of synaptonemal complex
b.	Pachytene	(ii)	Appearance of recombination nodules
c.	Diplotene	(iii)	Terminalisation of chiasmata
d.	Zygotene	(iv)	Dissolution of synaptonemal complex

(1) a(iii), b(ii), c(i), d(iv)

(2) a(iii), b(ii), c(iv), d(i)

(3) a(ii), b(iii), c(iv), d(i)

(4) a(iv), b(i), c(ii), d(iii)

123. Which of the following is not **true** about binomial nomenclature?

(1) Biological names are generally taken from Latin language

(2) Biological names are printed in italics

(3) First word denotes the specific epithet

(4) When handwritten, biological name is separately underlined

124. Read the following statements (A - D)
(a) Cyanobacteria are unicellular, colonial or filamentous algae.
(b) Fungi show a great diversity in morphology and habitat.
(c) Only the morphology of the mycelium and mode of spore formation are the basis for the division of the kingdom fungi into various classes.
(d) Bladderwort and venus fly trap are parasitic plants.
Select the **correct** set of statements from the options given below.

(1) Only (a), (b) and (c)

(2) Only (a) and (b)

(3) Only (b), (c) and (d)

(4) Only (c) and (d)

125. Read the following assertion (A) and reason (R) statements and select the correct option.
Assertion (A) : In the five kingdom classification of Whittaker, there is no mention of lichens and viruses.
Reason (R): Whittaker did not consider those organisms that have a cell structure.

(1) Both (A) and (R) are true and (R) is the correct explanation of (A)

(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(3) (A) is true but (R) is false

(4) (A) is false but (R) is true

126. Select the **mismatched** pair.

(1) Viruses – Inert crystalline structure outside living cell

(2) Viroids – Free RNA

(3) Prions – Abnormally folded protein

(4) Lichens – Grow well in polluted areas

127. Which of the given characters is shown by all members of protozoa?

(1) Unicellular

(2) Autotrophic nutrition

(3) Presence of flagella

(4) Silica shells

128. Select the **mismatched** pair.

(1) Order - Primata

(2) Genus - *Mangifera*

(3) Class - Poales

(4) Family - Canidae

129. In which of the following aspects *Mycoplasma* and bacteria are similar?

(1) Both have chlorophyll a

(2) Both have cilia

(3) Both have single stranded DNA

(4) Both lack nuclear envelope

130.

Identify the organism in the above figure and select the **incorrect** statement for the class to which it belongs.

(1) The vegetative reproduction is common by fragmentation

(2) The sex organs are absent, but plasmogamy is brought about by the fusion of two vegetative cells of different strains

(3) Karyogamy and meiosis results in the production of meiospores

(4) The asexual spores are produced endogenously on the conidiophores

131. Viruses could be crystallised and crystals consist largely of proteins, was shown by

(1) W.M. Stanley

(2) Dmitri Ivanowsky

(3) T.O. Diener

(4) M.W. Beijerinck

132. Match the column I with column II and select the **correct** option.

Column I	Column II
a. Methanogens	(i) Photoautotrophic
b. Halophiles	(ii) Guts of ruminants
c. Thermoacidophiles	(iii) Heterotrophic
d. Cyanobacteria	(iv) Hot water springs

(1) a(ii), b(iii), c(i), d(iv)

(2) a(ii), b(iii), c(iv), d(i)

(3) a(iii), b(ii), c(i), d(iv)

(4) a(iii), b(ii), c(iv), d(i)

133. Which of the following statements is **not** true for chrysophytes?

(1) They include diatoms and dinoflagellates

(2) Most of them are photosynthetic

(3) They are found in fresh water as well as in marine environments

(4) They float passively in water current

134. Select the type of genetic material which is found in TMV

(1) ssRNA

(2) dsDNA

(3) ssDNA

(4) dsRNA

135. Worker honey bees do **not** show

(1) Growth

(2) Reproduction

(3) Metabolism

(4) Consciousness

ZOOLOGY

136. Select the **correct** option to complete the analogy.
Ciliated epithelium : Lining of bronchioles :: Simple columnar epithelium : _____

(1) Lining of proximal convoluted tubules

(2) Wall of blood vessels

(3) Moist surface of buccal cavity

(4) Lining of small intestine

137. Select the **correct** pair.

(1) Tight junction – Stops leakage across tissue

(2) Gap junction – Act as cementing material between neighbouring cells

(3) Tight junction – Interdigitate to facilitate communication between cells for rapid transfer of ions

(4) Adhering junction – Connects the cytoplasm of adjoining cells

138. Choose the **odd** one w.r.t. the products of glands released through tubes or ducts.

(1) Earwax

(2) Milk

(3) Mucus

(4) Insulin

139. Fusiform ends and uninucleate condition is **not** the characteristic feature of muscle fibres present in the wall of

(1) Stomach

(2) Small intestine

(3) Arteries

(4) Human heart

140. Read the given statements.
(a) Tendons and ligaments are examples of dense irregular connective tissue.
(b) Fibre secreting cells are absent in fluid connective tissue.
(c) Presence of lamellae is common to both limb bones and cartilage in the tip of nose.
(d) Most of the cartilages in vertebrates embryos are replaced by bones in adults.
Select the option with **correct** statements.

(1) (a) and (b)

(2) (b) and (d)

(3) (c) and (d)

(4) (a), (b) and (c)

141. Consider the following statements.
(a) The intercellular material is solid and pliable, resisting compression
(b) Cells are enclosed in small cavities called lacunae within the matrix secreted by them
(c) The tissue interacts with smooth muscles to bring about body movements
(d) It is the site of production of blood cells
The statements which are applicable to cartilage include

(1) (a), (b) and (d)

(2) (a), (c) and (d)

(3) (c) and (d)

(4) (a) and (b)

142. **Assertion (A)** : Muscular tissue provides the action that moves the body to adjust to the changes in the environment and to maintain the positions of the various parts of the body.
Reason (R) : Muscle fibres contract and relax in response to stimulation in a non-coordinated fashion.
In the light of above statements, choose the correct option.

(1) Both (A) and (R) are true and (R) is the correct explanation of (A)

(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(3) Both (A) and (R) are false

(4) (A) is true but (R) is false

143. Areolar tissue is characterised by the presence of
(a) Adipocytes
(b) Mast cells
(c) Fibroblasts
(d) Macrophages
Select the correct option.

(1) (a), (b) and (c) only

(2) (b), (c) and (d) only

(3) (a), (b), (c) and (d)

(4) (a), (c) and (d) only

144. Consider the features listed below.
a. A secondary metabolite
b. Cannot hold I_2 molecules
c. Homopolymer of glucose
All the above features are true for

(1) Chitin

(2) Inulin

(3) Starch

(4) Cellulose

145. Select the **mismatch** w.r.t. average composition of cells.

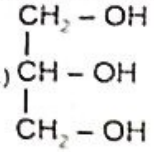
(1) Protein – 10-15%

(2) Lipids – 7%

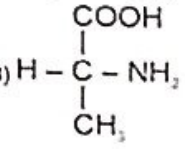
(3) Nucleic acids – 5-7%

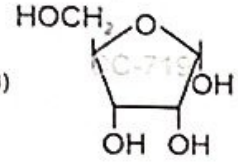
(4) Water – 70-90%

146. Select the **incorrect** match.

(1)  – Trihydroxypropane

(2) $CH_3-(CH_2)_{14}-COOH$ – Saturated fatty acid

(3)  – Simplest amino acid

(4)  – Pentose sugar of RNA

(1) (1)

(2) (2)

(3) (3)

(4) (4)

147. Succinate dehydrogenase is inhibited by which of the following substances, that closely resembles succinate in the structure?

(1) Fumarate

(2) Malonate

(3) Oxalate

(4) Acetate

148. A macromolecule 'X' is a structural homopolymer which is found in the exoskeleton of arthropods.
Monomeric unit of 'X' is

(1) Glucose

(2) N-acetyl glucosamine

(3) N-acetyl galactosamine

(4) Fructose

149. Read the following statements **A** and **B** and select the **correct** option.
Statement-A : The activity of an enzyme can be affected by change in pH and temperature which can alter the tertiary structure of enzymes.
Statement-B : Each enzyme shows its highest activity at a temperature called optimum temperature.

(1) Both statements A and B are incorrect

(2) Statement A is correct and B is incorrect

(3) Both statements A and B are correct

(4) Statement A is incorrect and B is correct

150. Select the **incorrect** statement w.r.t. rate of a reaction.

(1) Rate of a physical or chemical process refers to the amount of product formed per unit time

(2) Rate can also be called velocity if the direction is specified

(3) Rates of physical and chemical processes are influenced by temperature among other factors

(4) A general thumb rule is that rate doubles or decreases by half for every 30°C change in either direction

151. The heterocyclic nitrogenous bases containing double ring in their structure, found in RNA are

(1) Adenine and Guanine

(2) Uracil and Thymine

(3) Cytosine and Thymine

(4) Cytosine and Guanine

152. "All enzymes are proteins". An exception to this is

(1) Ribozyme

(2) Dehydrogenase

(3) Hydrogenase

(4) Lipase

153. Choose the **incorrectly** matched pair

(1) Insulin – Heteropolymeric hormone

(2) Toxin – Curcumin

(3) Chitin – Homopolysaccharide

(4) Lectin – Concanavalin A

154. How many of the following are chemically proteins?

Collagen, Trypsin, Insulin, Antibody, Receptor, GLUT-4

(1) Four

(2) Six

(3) Five

(4) One

155. Biomolecule which **cannot** be considered as a polymer is

(1) RuBisCO

(2) Gingely oil

(3) Glycogen

(4) Cellulose

156. ___X___ is the most abundant protein in the whole biosphere whereas ___Y___ is the most abundant protein in the animal world.
Choose the option that fills the blanks **correctly**.

	X	Y
(1)	RuBisCO	Collagen
(2)	Collagen	Keratin
(3)	Keratin	RuBisCO
(4)	Keratin	Collagen

(1) (1)

(2) (2)

(3) (3)

(4) (4)

157. In a nucleic acid, the bond between the phosphate and hydroxyl group of a sugar is

(1) Peptide bond

(2) Ester bond

(3) Glycosidic bond

(4) Hydrogen bond

158. All α-amino acids contain, all of the following **except**

(1) Carboxyl group

(2) α-Carbon

(3) Hydrogen

(4) Methyl group

159. Arrange the following in increasing order w.r.t. their values in a healthy adult human under normal resting conditions.
A. Tidal volume
B. Residual volume
C. Inspiratory reserve volume
D. Vital capacity

(1) A < C < B < D

(2) A < D < B < C

(3) A < D < C < B

(4) A < B < C < D

160. Read the following statements.
Statement A : Humans cannot directly alter the pulmonary volume.
Statement B : The anatomical setup of human lungs in thorax is such that any change in the volume of the thoracic cavity will be reflected in the lung cavity.
Choose the correct option

(1) Both statements (A) and (B) are incorrect

(2) Only statement (A) is incorrect

(3) Both statements (A) and (B) are correct

(4) Only statement (B) is incorrect

161. **Assertion (A):** Lungs collapse if one performs forceful expiration under normal physiological conditions.
Reason (R): Residual volume is the volume of air usually remaining in lungs but can be expired on forceful expiration.
In the light of above statements, choose the correct option.

(1) (A) is true but (R) is false

(2) Both (A) and (R) are false

(3) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(4) Both (A) and (R) are true and (R) is the correct explanation of (A)

162. Long exposure of dust to workers involved in grinding or stone breaking industries results in

(1) Inflammation of lungs leading to regeneration of muscles of lungs

(2) Inflammation of lungs leading to fibrosis

(3) Rejuvenation of defense mechanism of body

(4) No effect on lungs

163. Select the **incorrect** statement w.r.t. oxygen-haemoglobin dissociation curve in humans

(1) It is sigmoid or 'S' shaped

(2) Low partial pressure of oxygen will shift the curve to right

(3) Low H^+ concentration is favourable for shifting of curve to left

(4) Shifting of curve towards left indicates dissociation of oxygen from Hb

164. How many cellular layer(s) have to be crossed by oxygen to reach the blood present in pulmonary capillaries from alveolar air?

(1) One

(2) Two

(3) Three

(4) Four

165. The value of pO_2 in deoxygenated blood is equal to the value of

(1) pCO_2 in atmospheric air

(2) pO_2 in alveoli

(3) pCO_2 in deoxygenated blood

(4) pCO_2 in oxygenated blood

166. Select the correct set of respiratory volumes/ capacities which cannot be measured by a simple spirometer.

(1) TV, ERV

(2) VC, IRV

(3) FRC, TLC

(4) EC, IC

167. Select the **incorrect** match w.r.t. respiratory structures in different animals.

(1) Gills – Aquatic arthropods

(2) Lungs – Birds

(3) Moist cuticle – Earthworms

(4) Tracheal tubes – Frogs

168. How many structures given in the box below play important roles in humidification and bringing the atmospheric air to the body temperature in humans?

Nasopharynx, Trachea, Bronchi, Alveolar ducts, Terminal bronchioles, Larynx

Choose the **correct** option.

(1) Six

(2) Five

(3) Three

(4) Four

169. Choose the **incorrect** pair w.r.t. transport of gases.

	Gases	Percentage	Transported in/as
(1)	O_2	97%	Oxyhaemoglobin by RBCs
(2)	CO_2	20-25%	Carbamino-haemoglobin by RBCs
(3)	O_2	3%	Dissolved state through plasma
(4)	CO_2	7%	Bicarbonate ions

(1) (1)

(2) (2)

(3) (3)

(4) (4)

170. A healthy adult human breathes 'X' times/minute under normal condition. 'X' is numerically equal to

(1) % of protein present in blood plasma

(2) Amount of haemoglobin in grams present in every 100 mL of blood of a healthy adult human

(3) % of monocytes in total leucocyte count

(4) Number of heart beats per minute of a healthy man

171. In humans, all of the following formed elements are nucleated, **except**

(1) Thrombocytes

(2) Lymphocytes

(3) Eosinophils

(4) Basophils

172. Depolarisation of ventricles in ECG is represented by

(1) P-wave

(2) QRS complex

(3) T-wave

(4) P-R interval

173. Erythroblastosis fetalis is a condition which can be seen in subsequent pregnancies of a

(1) Rh –ve mother having Rh +ve foetus

(2) Rh +ve mother having Rh –ve foetus

(3) Rh –ve mother having Rh – ve foetus

(4) Rh +ve mother having Rh +ve foetus

174. Under normal physiological conditions, the maximum number of action potentials generated by SAN in humans are

(1) 70-75/second

(2) 70-75/minute

(3) 10-12/minute

(4) 60-65/second

175. Which statement is **incorrect** for regulation of cardiac activity?

(1) Normal activity of heart is regulated intrinsically

(2) Medulla oblongata can moderate cardiac functions

(3) Nerve signals through sympathetic nerves decrease the rate of heartbeat

(4) Adrenal medullary hormones can increase the cardiac output

176. The **correct** route through which impulse travels in the heart is

(1) AV node → Bundle of His → SA node → Purkinje fibres

(2) SA node → AV node → Bundle of His → Purkinje fibres

(3) AV node → Purkinje fibre → SA node → Bundle of His

(4) SA node → Bundle of His → AV node → Purkinje fibre

177. If the cardiac output of a person is about 6.3 litres/minute and his stroke volume is 70 mL, then heart rate of the person will be

(1) 100 beats/minute

(2) 90 beats/minute

(3) 80 beats/minute

(4) 70 beats/minute

178. All of the following are correct w.r.t. human RBCs, **except**

(1) Formed in the red bone marrow in the adults

(2) Devoid of nucleus

(3) Contain red-coloured, iron containing complex protein

(4) Biconvex in shape

179. Match the column I with column II.

	Column I		Column II
a.	Heart failure	(i)	Deposition of calcium, fat cholesterol and fibrous tissues in coronary artery
b.	Heart attack	(ii)	Symptom of acute chest pain when not enough oxygen is reaching the heart muscle
c.	Angina pectoris	(iii)	State of heart when it is not pumping blood effectively enough to meet the needs of the body
d.	Atherosclerosis	(iv)	When the heart muscle is suddenly damaged by an inadequate blood supply

Choose the **correct** option.

(1) a(iii), b(iv), c(ii), d(i)

(2) a(iv), b(ii), c(i), d(iii)

(3) a(ii), b(i), c(iv), d(iii)

(4) a(i), b(ii), c(iii), d(iv)

180. Select the **incorrect** match w.r.t. blood vessels.

(1) Tunica intima – An inner lining of simple squamous epithelium

(2) Tunica media – A middle layer of skeletal muscle and elastic fibres

(3) Tunica externa – An external layer of fibrous connective tissue with collagen fibres

(4) Tunica media – Thinner in veins as compared to arteries