



Aakash

Medical | IIT-JEE | Foundations

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MOCK TEST for NEET-2025

MM : 720

Test-5

Time : 3 Hrs.

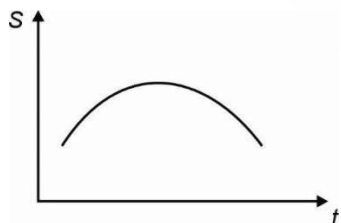
Complete Syllabus of class XI & XII

Instructions :

- (i) Duration of Test is 3 hrs.
- (ii) The Test consists of **180** questions. The maximum marks are **720**.
- (iii) There are four parts in the question paper consisting of Physics, Chemistry, Botany and Zoology having **45** questions in each part of equal weightage.
- (iv) 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.
- (v) 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.
- (vi) Dark the circle in the space provided only.
- (vii) 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. Position-time(S-t) graph of a particle moving in a straight line is shown below.



Speed of the particle is

- (1) Constant
 - (2) First increases then decreases
 - (3) First decreases then increases
 - (4) Continuously increases
2. A stone is released from the top of a tower and it reaches ground in 8 s. Its height from the ground when its speed is 40 m s^{-1} is ($g = 10 \text{ m/s}^2$)
- (1) 80 m
 - (2) 240 m
 - (3) 160 m
 - (4) 120 m

3. An object of mass 3 kg is moving with 36 km/h is acted by a force and its velocity becomes 54 km/h in the same direction of motion. Impulse of the force is

- (1) Zero
- (2) 75 kg m s^{-1}
- (3) 25 kg m s^{-1}
- (4) 15 kg m s^{-1}

4. A piston of cross-sectional area 150 cm^2 is used in a hydraulic lift to exert a force of 10^6 dynes on the water. The cross-sectional area of the other piston is $15 \times 10^5 \text{ cm}^2$. The load it balance is

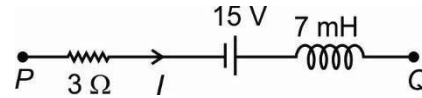
- (1) 10^4 N
- (2) 10^5 N
- (3) 10^3 N
- (4) 10^6 N

5. 2 moles of diatomic gas is contained in a container of volume V has pressure P . Its internal energy is

- (1) $\frac{3}{2}PV$
- (2) $3PV$
- (3) $\frac{5}{2}PV$
- (4) $5PV$

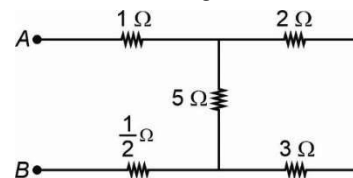
6. Two charges $+3Q$ and $-Q$ are placed at some distance apart. If N is the number of electric field lines originates from $+3Q$, then the number of field lines which terminates at infinity are
- (1) $\frac{N}{3}$ (2) $3N$
 (3) $\frac{2N}{3}$ (4) $\frac{N}{3}$
7. An electron and a proton are moving such that they have same de-Broglie wavelength. Then the kinetic energy of the proton is
- (1) Equal to the kinetic energy of electron
 (2) Greater than the kinetic energy of electron
 (3) Smaller than the kinetic energy of electron
 (4) Infinite
8. If energy of a body moving along x -axis at time ' t ' and position ' x ' is given by $E = \frac{A - x^2}{Bt}$, then the dimensions of $\left[\frac{A}{B}\right]$ will be
- (1) $[ML^2 T^{-1}]$ (2) $[MLT^{-2}]$
 (3) $[M^{-1}L^3 T^{-2}]$ (4) $[M^{-1}L^2 T]$
9. A particle is projected from ground at an angle of 60° from the horizontal with speed 150 m/s. The time (in second) after which the velocity of particle makes an angle 90° with its initial velocity is
- (1) $10\sqrt{3}$ (2) $\sqrt{30}$
 (3) $\sqrt{90}$ (4) $\sqrt{150}$
10. Young's modulus of a metal wire depends upon
- (1) Length of the wire
 (2) Area of cross-section of the wire
 (3) Volume of the wire
 (4) Nature of it's material
11. Four charges, each equal to $-Q$ are placed at the four corners of a regular pentagon and charge q is at its centre. Now a charge $+Q$ is placed on the fifth corner. If r is the distance of centre to each corner then the magnitude of net force on charge q is
- (1) $\frac{2KQq}{r^2}$ (2) $\frac{KQq}{r^2}$
 (3) $\frac{KQq}{2r^2}$ (4) Zero

12. The network shown below is a part of a complete circuit. If a current of 5 A is flowing through it and it is increasing at a rate of 2×10^3 A/s, then magnitude of potential difference between the points P & Q will be



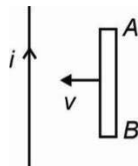
- (1) 20 V (2) 15 V
 (3) 7 V (4) 14 V
13. A hollow conducting sphere of radius R has a charge Q . The electric potential (V) due to the sphere at a distance r from the centre of sphere is
- (1) $V = 0$ for $r < R$ and $V = \frac{Q}{4\pi\epsilon_0 r}$ for $r \geq R$
 (2) $V = \frac{Q}{4\pi\epsilon_0 r}$ for all values of r
 (3) $V = \frac{Q}{4\pi\epsilon_0 R}$ for $r < R$ and $V = \frac{Q}{4\pi\epsilon_0 r}$ for $r \geq R$
 (4) $V = \frac{2Q}{\pi\epsilon_0 r}$ for $r < R$ and $V = \frac{Q}{4\pi\epsilon_0 r}$ for $r \geq R$

14. The equivalent resistance between A and B for the network shown in the figure is



- (1) 2Ω (2) 3Ω
 (3) 4Ω (4) 7Ω
15. To decrease the current sensitivity of a moving coil galvanometer, one can decrease
- (1) Number of turns in coil
 (2) Magnetic field inside it
 (3) Area of its coil
 (4) All of the above
16. Rotational kinetic energy per molecule for a diatomic gas sample kept at temperature T is (k_B is Boltzmann constant)
- (1) $\frac{1}{2}k_B T$ (2) $\frac{3}{2}k_B T$
 (3) $k_B T$ (4) $\frac{5}{2}k_B T$

17. When a sound wave is refracted from air to water, then its
 (1) Wavelength increases
 (2) Frequency decreases
 (3) Wave number increases
 (4) Wave velocity remain unchanged
18. A current carrying long wire and a conducting rod AB are in the same plane. If the rod moves toward the wire with constant speed v as shown, then



- (1) End A will be at lower potential with respect to B
 (2) A and B are at same potential
 (3) End A will be at higher potential with respect to B
 (4) Both end A and B are at zero potential
19. The electric potential $V(x)$ in a region around the origin is given by $V(x) = 4x$ volts. Net electric charge enclosed in a cube of 1 m side with its centre at the origin, will be
 (1) $8\epsilon_0$ (2) $-4\epsilon_0$
 (3) $-8\epsilon_0$ (4) Zero

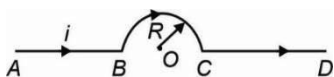
20. In an AC circuit the instantaneous values of emf and current are :

$E = 200 \sin(314t)$ volt and

$I = 10 \sin\left(314t + \frac{\pi}{3}\right)$ amp

The average power consumed in watt is

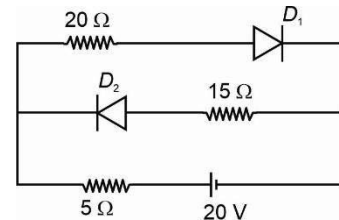
- (1) 2000 (2) 1000
 (3) 1500 (4) 500
21. In the figure shown the magnetic field at the centre (O) of the arc due to the current in section CD will be



- (1) $\frac{\mu_0 i}{2R}$ (2) $\frac{\mu_0 i}{4R}$
 (3) Zero (4) $\frac{\mu_0 i}{8R}$

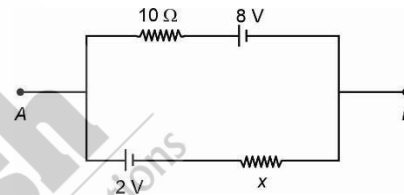
22. Correct volume-temperature relationship for an ideal gas undergoing adiabatic change is ($\gamma = C_p/C_v$)
 (1) $V^{\gamma-1} T^\gamma = \text{constant}$ (2) $VT^\gamma = \text{constant}$
 (3) $V^{\gamma-1} T = \text{constant}$ (4) $V^{1-\gamma} T = \text{constant}$

23. The current I through 20Ω resistor in the circuit given below is



- (1) 0.4 A (2) 0.2 A
 (3) 1 A (4) 0.8 A

24. If $V_A - V_B = 6 \text{ V}$ in the given figure then resistance X will be



- (1) 10Ω (2) 5Ω
 (3) 6Ω (4) 20Ω

25. If the resistance of a galvanometer coil is R , then the shunt resistance required to convert it into an ammeter of range 3 times, will be

- (1) $\frac{R}{4}$ (2) $\frac{R}{2}$
 (3) $4R$ (4) $2R$

26. A body takes 10 minutes to cool from 90°C to 80°C . if the temperature of the surrounding is 20°C . Time taken by it to cool from 80°C to 70°C in same surrounding will be

- (1) 10 minutes (2) 5 minutes
 (3) 11.8 minutes (4) 15.4 minutes

27. The amount of heat required to convert 10 g of ice at 0°C to water at 80°C will be

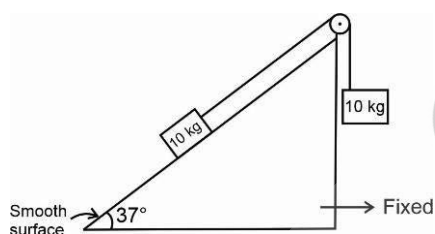
- (1) 800 cal (2) 2400 cal
 (3) 1600 cal (4) 3200 cal

28. If wavelength of given light waves in air and in a medium are 5000 \AA and 2500 \AA respectively, then the critical angle at the interface of medium air is

- (1) 30° (2) 45°
 (3) 60° (4) 37°

29. A simple microscope consists of a convex lens of power + 10 D. If the image is formed at infinity then the magnifying power is
- (1) 3.5
 - (2) 5
 - (3) 4
 - (4) 2.5
30. A ray of light strikes a material's slab at an angle of incidence 53° . If the reflected and refracted rays are perpendicular to each other, then refractive index of the material is
- (1) $\frac{3}{5}$
 - (2) $\frac{4}{3}$
 - (3) $\frac{4}{5}$
 - (4) $\frac{5}{4}$

31. In the figure shown below the wedge is smooth and fix. If the given system is released from rest, then acceleration of the blocks is



- (1) 1 m/s^2
 - (2) 4 m/s^2
 - (3) 3 m/s^2
 - (4) 2 m/s^2
32. A particle performs SHM on x-axis with amplitude A and time period T . If at $t = 0$ particle is at mean position and moving towards positive x-axis, then time taken by it to travel a distance $\frac{A}{2}$ will be
- (1) $\frac{T}{6}$
 - (2) $\frac{T}{4}$
 - (3) $\frac{T}{8}$
 - (4) $\frac{T}{12}$
33. The radius of gyration of a disc of mass 500 g and radius 5 cm about an axis passing through its centre and perpendicular to its plane, is
- (1) 5 cm
 - (2) 2.5 cm
 - (3) 3.54 cm
 - (4) 1.51 cm

34. A system consists of 3 particles each of mass m located at point (1, 2), (2, 3) and (3, 4). The coordinates of the center of mass of system are
- (1) (1, 2)
 - (2) (3, 2)
 - (3) (2, 3)
 - (4) (2, 1)

35. Given below are two statements: one is labelled Assertion (A) and other is labelled as Reason (R).

Assertion (A) : Time varying magnetic field induces electric field.

Reason (R) : Time varying electric field never induces magnetic field.

In the light of the above statements, choose the correct answer.

- (1) Both **A** and **R** are true and **R** is the correct explanation of **A**
- (2) Both **A** and **R** are true and **R** is **NOT** the correct explanation of **A**
- (3) **A** is true but **R** is false
- (4) Both **A** and **R** are false

36. A long straight thin wire is placed along negative z direction starting from origin and it carries a current I . The magnitude of magnetic field at point 'P' having coordinates (0, 0, 5 m) is

- (1) Zero
- (2) $\frac{\mu_0 I}{10\pi}$ T
- (3) $\frac{\mu_0 I}{5\pi}$ T
- (4) $\frac{\mu_0 I}{20\pi}$ T

37. A 10 V ac supply is applied to a circuit consisting of a resistance and an inductive reactance of $5\sqrt{3} \Omega$ in series. If the voltage across the resistor is 5 V, then the current in the inductor is

- (1) 1 A
- (2) 2 A
- (3) 5 A
- (4) $\frac{1}{\sqrt{3}}$ A

38. For an equilateral prism, the condition of minimum deviation is achieved when angle of incidence is equal to 45° . Refractive index of the material of prism is

- (1) $\sqrt{3}$
- (2) $\sqrt{2}$
- (3) $2\sqrt{3}$
- (4) $2\sqrt{2}$

39. Given below are two statements: one is labelled Assertion (A) and other is labelled as Reason (R).

Assertion (A): By de-Broglie hypothesis, $\lambda = \frac{h}{p}$ is

valid for both the electron and the photon.

Reason (R): If the electron has the same wavelength as a photon then they have same energy.

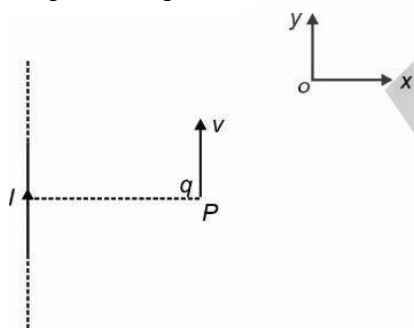
In the light of the above statements, choose the correct answer.

- (1) Both **A** and **R** are true and **R** is the correct explanation of **A**
- (2) Both **A** and **R** are true and **R** is **NOT** the correct explanation of **A**
- (3) **A** is true but **R** is false
- (4) Both **A** and **R** are false

40. The maximum speed of a particle executing SHM is 2 m s^{-1} and maximum acceleration is $\pi \text{ m s}^{-2}$. Its frequency is

- (1) 0.25 s^{-1} (2) 2 s^{-1}
- (3) 4 s^{-1} (4) 0.5 s^{-1}

41. A very long straight wire carries a current I is along y -axis. At the instant when a charge $+q$ at point P has velocity v as shown, the direction of force on the charge is along



- (1) Negative x -axis (2) Positive x -axis
- (3) Negative z -axis (4) Positive z -axis

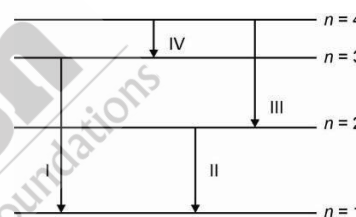
42. In a fusion process, two nuclei A and B fuse to form nucleus C , their binding energies being E_a , E_b and E_c respectively. Then

- (1) $E_c < E_a + E_b$
- (2) $E_c = E_a + E_b$
- (3) $E_c > E_a + E_b$
- (4) $E_c = 2E_a$

43. Name the gate which represents the Boolean expression $y = \bar{A} + \bar{B}$

- (1) NOR (2) NAND
- (3) OR (4) AND

44. The diagram shows the energy levels for an electron transition in a certain amount of hydrogen gas atom. For which transition wavelength of the emitted photon will be minimum?



- (1) I (2) II
- (3) III (4) IV

45. A body has weight 1000 N on the surface of the earth. How much would it weigh at 1600 km above the surface of the earth?

(Given radius of earth is 6400 km and $g = 10 \text{ m s}^{-2}$)

- (1) 760 N (2) 640 N
- (3) 320 N (4) 580 N

CHEMISTRY

46. Match List-I with List-II.

	List-I (Quantum number)		List-II (Orbital)
(a)	$n = 3, l = 2$	(i)	$2p$
(b)	$n = 3, l = 1$	(ii)	$3d$
(c)	$n = 2, l = 1$	(iii)	$3p$
(d)	$n = 4, l = 3$	(iv)	$4f$

Choose the correct answer from the options given below.

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

47. Match List-I with List-II

	List-I Oxide		List-II Nature
(a)	Cl ₂ O ₇	(i)	Basic
(b)	Al ₂ O ₃	(ii)	Acidic
(c)	Na ₂ O	(iii)	Neutral
(d)	N ₂ O	(iv)	Amphoteric

Choose the correct answer from the options given below.

- (1) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
 (2) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)
 (3) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (4) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
48. A first order reaction is 30% complete in 3.32 seconds.

The half life of a reaction is $\left(\log \frac{10}{7} = 0.155\right)$

- (1) 7.65 seconds (2) 5.45 seconds
 (3) 8.95 seconds (4) 6.45 seconds
49. Incorrect statement about the characteristics of interstitial compounds is
- (1) They have higher melting points than parent metals
 (2) They are very hard, some borides approach diamond in hardness
 (3) They retain metallic conductivity
 (4) They are chemically more reactive than parent metals

50. If $\Delta_r H^\circ$ of CaCO₃(s), CaO(s) and CO₂(g) are -1300, -650 and -500 kJ/mol respectively then $\Delta_r H^\circ$ of the reaction will be



- (1) -150 kJ/mol (2) 150 kJ/mol
 (3) -2450 kJ/mol (4) 2450 kJ/mol
51. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Λ_m for weak electrolytes shows a sharp decrease when the electrolytic solution is diluted.

Reason (R): For weak electrolytes degree of dissociation increases with dilution of solution.

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

- (1) Both (A) and (R) are true and (R) is correct explanation of (A)
 (2) Both (A) and (R) are true but (R) is not correct explanation of (A)
 (3) Only (A) is true and (R) is false
 (4) Only (A) is false and (R) is true

52. In which of the following options, the order of arrangement does not agree with the variation of property indicated against it?

- (1) I < Br < F < Cl (negative electron gain enthalpy)
 (2) Cl⁻ < S²⁻ < Ca²⁺ < K⁺ (increasing ionic size)
 (3) B < C < O < N (first ionisation enthalpy)
 (4) C < N < O < F (electronegativity)

53. If radius of third Bohr orbit of the He⁺ ion is 238.05 pm. The radius of third Bohr orbit of Li²⁺ ion is

- (1) 1.587 pm (2) 158.7 Å
 (3) 15.87 pm (4) 158.7 pm

54. Match List-I with List-II

	List-I (Molecules)		List-II (Shape)
(a)	BrF ₅	(i)	Trigonal bipyramidal
(b)	PF ₅	(ii)	Square pyramidal
(c)	SF ₄	(iii)	Square planar
(d)	XeF ₄	(iv)	See-saw

Choose the correct answer from the options given below.

- (1) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
 (2) (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)
 (3) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
 (4) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)
55. Which amongst the following is an **incorrect** statement?
- (1) H₂⁺ has one electron
 (2) Be₂ molecule does not exist
 (3) Bond orders of O₂⁺, O₂, and O₂²⁻ are 1.5, 2.5 and 2 respectively
 (4) C₂ molecule has four electrons in its two degenerate π molecular orbitals
56. Extensive property among the following is
- (1) Internal energy (2) Temperature
 (3) Density (4) Pressure

57. Consider the following statements
- p-nitrophenol is more acidic than phenol.
 - Oxidation of phenol with chromic acid produces a conjugated diketone.
 - In Kolbe's reaction, phenol forms orthohydroxy benzaldehyde.

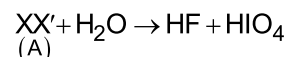
The correct statements are

- (1) (a) and (b) only (2) (b) and (c) only
 - (3) (a) and (c) only (4) (a), (b) and (c)
58. Mark the **incorrect** statement out of the following.
- (1) Group I basic radicals precipitate as chlorides
 - (2) Group II basic radicals precipitate as sulphides
 - (3) Group V basic radicals precipitate as hydroxides
 - (4) Group IV basic radicals precipitate as sulphides

59. The species which will not undergo disproportionation reaction is

- (1) S_8 (2) Cl_2
- (3) P_4 (4) F_2

60. In the following reaction, reactant (A) is



- (1) IF_3 (2) F_2
- (3) IF_5 (4) IF_7

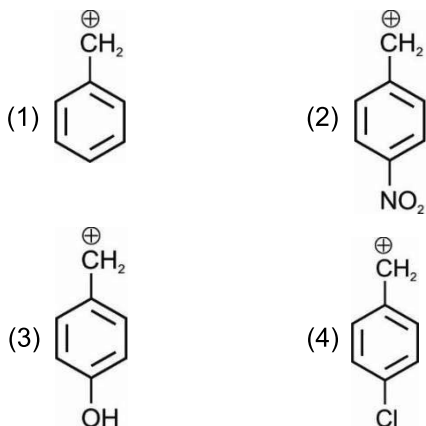
61. Glucose on reaction with bromine water gives

- (1) Gluconic acid (2) Saccharic acid
- (3) Glyceraldehyde (4) Sorbitol

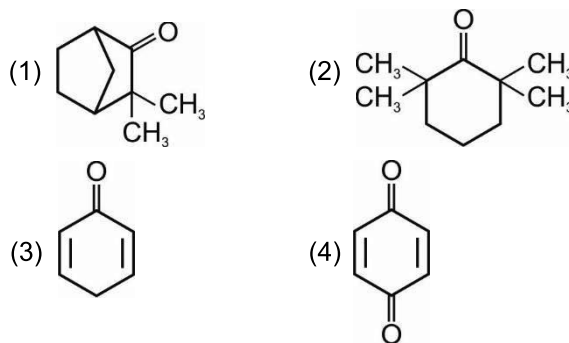
62. Which of the following gives positive Tollens' test but negative Fehling's test?

- (1) HCHO (2) CH_3CHO
- (3) Ph-CHO (4) CH_3COCH_3

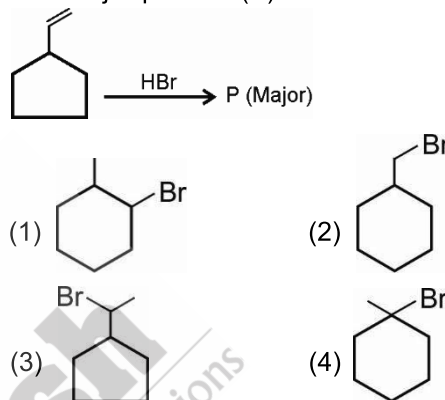
63. The least stable carbocation among the following is



64. Which among the following molecules can exhibit tautomerism?



65. The major product (P) obtained in the reaction is



66. Identify 'X' from the following reaction



- (1) $FeCl_3$ (2) $PbCl_2$
- (3) $ZnCl_2$ (4) $NiCl_2$

67. In Carius method of estimation of halogen, 0.28 g of an organic compound gave 0.2 g of AgBr. The percentage of bromine in the compound is

(Atomic mass of Ag = 108 u, Br = 80 u)

- (1) 38.2% (2) 46.2%
- (3) 30.4% (4) 25.6%

68. 5% (w/v) solution of urea is isotonic with 2% (w/v) solution of a non-electrolyte substance. The molar mass of the substance is

- (1) 180 g/mol
- (2) 24 g/mol
- (3) 120 g/mol
- (4) 30 g/mol

69. Mole fraction of the solvent in a 1.00 molal aqueous solution is nearly

- (1) 0.0982 (2) 0.058
- (3) 0.982 (4) 0.0528

70. Match the reactions given in column-I with the statements given in column-II.

	Column-I		Column-II
a.	Ammonolysis	(i)	Preparation of amines with one carbon atom less than that present in the amide
b.	Gabriel phthalimide synthesis	(ii)	Detection test for primary amines
c.	Hoffmann bromamide degradation reaction	(iii)	Preparation of 1° aliphatic amines
d.	Carbylamine reaction	(iv)	Reaction of alkyl halides with NH ₃

Choose the correct option.

- (1) a(i), b(ii), c(iii), d(iv)
 (2) a(iii), b(iv), c(i), d(ii)
 (3) a(iv), b(iii), c(i), d(ii)
 (4) a(iv), b(i), c(iii), d(ii)
71. The constituents of bronze are
 (1) Cu and Sn (2) Cu and Ag
 (3) Cu and Zn (4) Zn and Ag
72. The correct order of acidic character is
 (1) H₂Te < H₂Se < H₂S < H₂O
 (2) H₂S < H₂O < H₂Se < H₂Te
 (3) H₂Se < H₂Te < H₂O < H₂S
 (4) H₂O < H₂S < H₂Se < H₂Te
73. Consider the following statements.
Statement I: The total entropy change (ΔS_{total}) for the system and surroundings of a spontaneous process is given by

$$\Delta S_{\text{total}} = \Delta S_{\text{system}} + \Delta S_{\text{surr}} > 0$$

Statement II: When a system is in equilibrium, the entropy is maximum, and the change in entropy, $\Delta S = 0$.
 Choose the **correct** option.
 (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 incorrect
 (4) Both statement I and statement II are correct

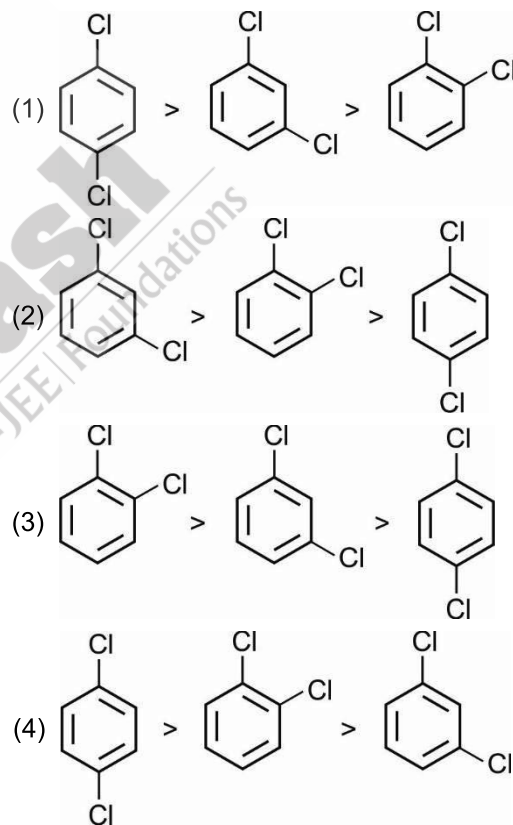
74. The number of moles of KMnO₄ needed to react completely with two moles of iodide ion in acidic medium is

- (1) $\frac{2}{5}$ moles (2) $\frac{1}{5}$ moles
 (3) $\frac{1}{3}$ moles (4) $\frac{2}{3}$ moles

75. The maximum number of ions produced from the complex K₄[Fe(CN)₆] in an aqueous solution is

- (1) 4
 (2) 5
 (3) 6
 (4) 7

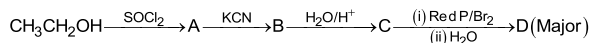
76. The **correct** order of melting point among the following is



77. Which of the following statements is incorrect about diborane?

- (1) The four terminal hydrogen atoms and the two Boron atoms lie in one plane
 (2) The bond length of terminal B–H bond is more than the bond length of bridge B–H bond
 (3) Both the Boron atoms are sp³ hybridised
 (4) The four terminal B–H bonds are two centre two electrons bonds

78. Consider the following reaction,



product D is

- (1) $\text{CH}_3\text{CH}_2\text{-}\overset{\text{O}}{\parallel}\text{C-Br}$
 (2) $\text{CH}_3\text{-}\underset{\text{Br}}{\text{CH}}\text{-COOH}$
 (3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$
 (4) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$

79. Consider the following statements.

Statement I: Primary aliphatic amines react with HNO_2 to give stable diazonium salts.

Statement II: Primary Aromatic amines react with HNO_2 to form diazonium salts at low temperatures (273-278 K).

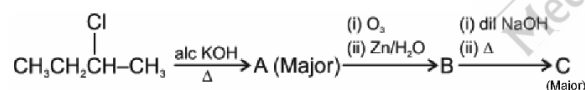
Choose the **correct** option.

- (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 incorrect
 (4) Both statement I and statement II are correct

80. The least acidic compound among the following is

- (1) CH_3COOH
 (2) $\text{C}_6\text{H}_5\text{CH}_2\text{COOH}$
 (3) HCOOH
 (4) $\text{C}_6\text{H}_5\text{COOH}$

81. In the following reaction sequence



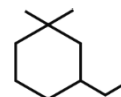
product C is

- (1) But-3-enal
 (2) But-2-enal
 (3) Butan-2-one
 (4) Butanoic acid

82. Which of the following is a free radical substitution reaction?

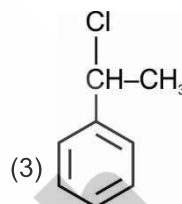
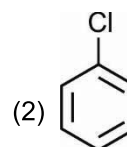
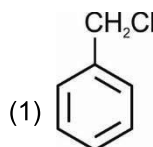
- (1) Propene with $\text{HBr}/(\text{C}_6\text{H}_5\text{CO})_2\text{O}_2$
 (2) Methane with $\text{Br}_2/h\nu$
 (3) Propyne with HgSO_4 and dil. H_2SO_4 at 333 K
 (4) Benzene with CH_3Cl in presence of anhydrous AlCl_3

83. Which of the following options represents correct IUPAC name for the given compound?



- (1) 1-Ethyl-3,3-dimethylcyclohexane
 (2) 3-Ethyl-1,1-diethylcyclohexane
 (3) 1, 1-Dimethyl-3-Ethylcyclohexane
 (4) 3-Ethyl-1, 1-dimethylcyclohexane

84. Which of the following is most reactive toward $\text{S}_{\text{N}}1$ reaction?



- (4) $\text{CH}_3\text{-Cl}$

85. Which of the following statements is correct regarding a solution of two components A and B exhibiting negative deviation from ideal behaviour?

- (1) $\Delta_{\text{mix}}H \geq 0$ at constant T and P
 (2) Intermolecular attractive forces between A-A and B-B are stronger than those between A-B
 (3) $\Delta_{\text{mix}}V = 0$ at constant T and P
 (4) Intermolecular attractive forces between A-A and B-B are weaker than those between A-B

86. Consider the following statements.

Statement I: Lead storage battery consists of a lead anode and a grid of lead packed with lead dioxide as cathode.

Statement II: A 38% solution of hydrochloric acid is used as an electrolyte, in lead storage battery.

Choose the **correct** option.

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

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

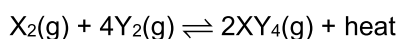
Assertion (A): Picric acid reacts with sodium bicarbonate to give effervescence of carbon dioxide.

Reason (R): Picric acid is a stronger acid than carbonic acid.

In the light of above statements, choose the correct option among the following.

- (1) (A) is true but (R) is false
- (2) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (3) (A) is false but (R) is true
- (4) Both (A) and (R) are true but (R) is not the correct explanation of (A)

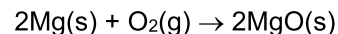
88. For the reversible reaction,



The equilibrium shifts in forward direction

- (1) By increasing concentration of $XY_4(g)$
- (2) By decreasing the pressure
- (3) By decreasing the concentration of $X_2(g)$ and $Y_2(g)$
- (4) By increasing pressure and decreasing temperature

89. In the reaction,



When 1 g of magnesium and 0.32 g of oxygen are made to react to completion

- (1) 0.1 mole of MgO will be produced
- (2) All the magnesium is consumed
- (3) All the oxygen is consumed
- (4) 0.03 moles of Mg(s) left

90. Consider the following statements.

Statement I: The metal carbon bond in metal carbonyls possesses both σ and π character.

Statement II: The M-C π bond is formed by the donation of a pair of electrons from a filled d orbital of metal into the vacant antibonding π^* orbital of carbon monoxide.

Choose the **correct** option.

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

BOTANY

91. Read the following statements and select the **correct** option.

Assertion (A): Ecosystems are not exempted from the second law of thermodynamics.

Reason (R): Flow of energy from sun to producers and then to consumers in an ecosystem is unidirectional.

- (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

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

	Column I		Column II
a.	Axile placentation	(i)	Cabbage
b.	Basal placentation	(ii)	Okra

c.	Parietal placentation	(iii)	Primrose
d.	Free central placentation	(iv)	Wheat

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

93. All of the following features are associated with China rose, **except**

- (1) Endospermic seeds
- (2) Actinomorphic flowers
- (3) Twisted aestivation in calyx
- (4) Pentacarpellary ovary

94. Dicot roots differ from monocot roots

- (1) In having radial vascular bundles
- (2) In having exarch type of arrangement of primary xylem
- (3) In showing secondary growth
- (4) In having root hairs

95. The endoplasmic reticulum
- (1) Consists of parallelly stacked cristae
 - (2) Divides the intracellular space into two distinct compartments
 - (3) Lacks tubules and vesicles
 - (4) Can only be functional at acidic pH
96. Dissolution of synaptonemal complex characterise the stage where
- (1) Nucleolus gets completely disappeared
 - (2) Chiasmata can be visualised
 - (3) Crossing over takes place
 - (4) Formation of tetrad takes place
97. Which of the following is **incorrect** w.r.t. xanthophylls?
- (1) It can absorb light and transfer energy to chlorophyll *a*
 - (2) It enables a wider range of wavelength of incoming light to be utilised
 - (3) It imparts yellow green colour in the chromatogram
 - (4) It protects chlorophyll *a* from photo-oxidation
98. The mobile carrier for transfer of electrons between complex III and IV is
- (1) A small lipid molecule located within the inner membrane
 - (2) Capable of oxidising NADPH
 - (3) Composed of FMN and two copper centres
 - (4) A small protein attached to the outer surface of the inner membrane
99. A sigmoid curve
- (1) Lacks stationary phase
 - (2) Is seen when nutrients are unlimited
 - (3) Can be represented by equation $L_t = L_0 + rt$
 - (4) Is a characteristic of living organism growing in a natural environment
100. β -thalassemia is similar to sickle cell anaemia in all of the following aspects, **except**
- (1) Being an autosomal recessive trait
 - (2) Being controlled by a single gene on chromosome 11
 - (3) Being a disorder associated with haemoglobin molecule
 - (4) Being a quantitative disorder
101. Read the following statements of Assertion (A) and Reason (R) and choose the **correct** option.
- Assertion (A):** Transcription and translation can be coupled in bacteria.
- Reason (R):** In bacteria, mRNA does not need processing and transcription and translation take place in cytosol.
- (1) (A) is true but (R) is false
 - (2) (A) is false but (R) is true
 - (3) Both the statements (A) and (R) are true and (R) is the correct explanation of (A)
 - (4) Both the statements (A) and (R) are true but (R) is not the correct explanation of (A)
102. Choose the **incorrect** statement.
- (1) Exine of the pollen grains is made up of sporopollenin.
 - (2) Pollen grains of many species cause severe allergies.
 - (3) Pollen grains of rice and wheat lose viability within 30 minutes of their release
 - (4) In majority of angiosperms, pollens are shed at three-celled stage.
103. Identify the stages of cell cycle based on the events given below.
- A. Synthesis of nucleotides, ATPs, amino acids, RNAs
- B. Cell doubles its DNA amount
- C. Duplication of mitochondria and chloroplast
- | | A | B | C |
|-----|----------------------|----------------------|----------------------|
| (1) | G ₂ phase | G ₁ phase | M phase |
| (2) | S phase | G ₂ phase | G ₀ phase |
| (3) | G ₀ phase | S phase | G ₁ phase |
| (4) | G ₁ phase | S phase | G ₂ phase |
104. Eukaryotic flagella and cilia are similar to each other as both
- a. Have '9+2' organisation of microtubules
 - b. Are surrounded by membrane
 - c. Help in locomotion
 - d. Give cartwheel appearance with no microtubules in the centre.
- (1) Only a and b
 - (2) Only c
 - (3) Only a and d
 - (4) Only a, b and c

105. Read the following statements and state true (T) or false (F) w.r.t. monocot leaf.
- In monocot leaf, both layers of epidermis are cuticularized.
 - Mesophyll is always differentiated into palisade and spongy parenchyma.
 - Vascular bundles are conjoint and closed.
 - Bulliform cells are found on adaxial surface.
- | | A | B | C | D |
|-----|---|---|---|---|
| (1) | T | F | T | F |
| (2) | T | F | T | T |
| (3) | F | F | T | T |
| (4) | T | F | F | T |
106. Read the following and choose the **incorrect** statement.
- Red algae show oogamous reproduction with complex post-fertilisation development.
 - Funaria* has multicellular and branched rhizoids.
 - Sequoia* is the smallest gymnosperm.
 - Cuscuta* is a parasitic flowering plant.
107. Insectivorous plants trap insects to meet their nitrogen needs, still they are placed in the kingdom Plantae because,
- They are multicellular
 - They are photosynthetic
 - They are eukaryotic
 - They are heterotrophic
- Only a and b
 - Only b
 - Only d
 - Only a, b and c
108. Viroids differ from viruses as the former
- Have genetic material
 - Have capsid
 - Are parasitic
 - Are devoid of protein coat
109. Select the **incorrectly** matched pair
- Microphylls – *Selaginella*
 - Macrophylls – Ferns
 - Leafy stage present – *Funaria*
 - Well-developed vascular tissues – *Marchantia*
110. How many of the given plants has/have zygomorphic flowers?
- Mustard, *Datura*, Chilli, Gulmohur, Bean
- Four
 - Three
 - Two
 - One
111. Read the following statements and select the **correct** option.
- Assertion (A):** Red-green colour blindness occurs in about 8% of males and only about 0.4% of females.
- Reason (R):** The genes that lead to red-green colour blindness are on the X chromosome
- Both (A) and (R) are true and (R) is the correct explanation of (A)
 - Both (A) and (R) are true but (R) is not correct explanation of (A)
 - (A) is true but (R) is false
 - (A) is false but (R) is true
112. Select the **odd** one out w.r.t sex determination in honey bee.
- Males produce sperms by mitosis
 - Unfertilised egg develops as a drone
 - Males do not have father but can have sons
 - Males have half the number of chromosomes than that of a female
113. Which of the following mode of pollination is opted by seagrasses?
- Pollination occurs in submerged condition by water
 - Male flowers are carried by water currents to female flowers at surface of water
 - Pollen grains in the air is trapped by stigma
 - Pollen grains are carried by rodents to the female flowers
114. DNA polymorphism can be defined as
- The mutations occurring only in the coding regions of DNA
 - The mutations that have direct impact on the individual's reproductive ability
 - The allelic sequence variation in which more than one variant at a locus occurs in human population with a frequency greater than 0.01
 - The inheritable mutation that is observed in a population at minimal frequency

115. Repetitive sequences in the human genome
- (1) Can never provide any evidence in tracing human history
 - (2) Shed light on chromosome structure, dynamics and evolution
 - (3) Make up less than 2% of the entire genome
 - (4) Code all types of proteins
116. Repressor gene of *lac* operon
- (1) Binds to the promoter region of the operon and prevents RNA polymerase from transcribing the operon
 - (2) Regulates the operon which is referred to as positive regulation
 - (3) Is activated by interaction with the inducer molecule
 - (4) Is synthesised constitutively
117. Statins produced by *Monascus purpureus*
- (1) Helps in removing clots from the blood vessels of patients who have undergone myocardial infarction
 - (2) Is used in detergent formulations
 - (3) Is used for clarifying bottled juices
 - (4) Acts by competitively inhibiting the enzyme responsible for synthesis of cholesterol
118. Thermoregulation
- (1) Is energetically expensive for many organisms
 - (2) Is seen in green plants
 - (3) Can be easily performed by shrews inhabiting polar regions
 - (4) Is not a prominent property that is responsible for the success of mammals on earth
119. Select the **odd** one out w.r.t hotspots.
- (1) These are regions of accelerated habitat loss
 - (2) These are regions which show low degree of endemism
 - (3) These are regions which show high levels of species richness
 - (4) Currently the biodiversity hotspots in the world are 34.
120. In taxonomical hierarchy, lower the taxa
- (1) Greater is the difficulty of determining the relationship to other taxa at the same level
 - (2) Greater is the number of organisms within the group
 - (3) Greater is the rank in hierarchy
 - (4) More are the characteristics that the members within the taxon share
121. Protein rich layer named pellicle is present in
- (1) Euglenoids
 - (2) Diatoms
 - (3) Bacteria
 - (4) Sac fungi
122. Select the **odd** one w.r.t. organisms showing haplo-diplontic life cycle.
- (1) *Marchantia*
 - (2) *Spirogyra*
 - (3) *Ectocarpus*
 - (4) *Polysiphonia*
123. The supporting root coming out of the lower nodes of the stem is called
- (1) Tap root
 - (2) Stilt root
 - (3) Pneumatophore
 - (4) Primary root
124. Main functioning of the cytoskeleton in a cell includes all, **except**
- (1) Cell division
 - (2) Mechanical support
 - (3) Motility
 - (4) Photophosphorylation
125. Single membranous cell organelle is
- (1) Mitochondria
 - (2) Lysosome
 - (3) Chloroplast
 - (4) Ribosome
126. Mitotic apparatus formation occurs during
- (1) Telophase
 - (2) Anaphase
 - (3) Metaphase
 - (4) Prophase
127. Karyokinesis is not followed by cytokinesis which results into the formation of
- (1) Syncytium
 - (2) Multicelled condition
 - (3) Haploid cells
 - (4) Uninucleate cells
128. Select the **odd** one out w.r.t plant factors affecting photosynthesis
- (1) Orientation of leaves
 - (2) Temperature
 - (3) Amount of chlorophyll
 - (4) Size of leaves
129. The RQ value of tripalmitin is
- (1) 1.0
 - (2) 0.9
 - (3) 0.7
 - (4) 1.4
130. All of the following are the reasons that cause seed dormancy, **except**
- (1) Presence of phenolic acids
 - (2) Presence of immature embryos
 - (3) Presence of nitrates
 - (4) Presence of impermeable and hard seed coat

131. Chromosomal complement of a person affected from phenylketonuria is
 (1) 44 + XXY (2) 44 + XY or 44 + XX
 (3) 44 + XO (4) 44 + XXX
132. In ABO blood grouping system of human beings, maximum possible number of genotypes and phenotypes respectively are
 (1) 6 and 4 (2) 6 and 6
 (3) 4 and 6 (4) 4 and 4
133. During transcription, opening of DNA helix is facilitated by
 (1) DNA helicase (2) DNA polymerase
 (3) DNA ligase (4) RNA polymerase
134. Histones are basic proteins as they are rich in amino acids
 (1) Lysine and Arginine
 (2) Methionine and Arginine
 (3) Methionine and Lysine
 (4) Lysine and Tryptophan
135. Primary sewage treatment process is a
 (1) Physical process
 (2) Chemical process
 (3) Biochemical process
 (4) Physiological process

ZOOLOGY

136. The epithelium which has a limited role in secretion and absorption is present in
 (1) Lining of PCT
 (2) Lining of stomach
 (3) Moist surface of buccal cavity
 (4) Inner lining of bronchioles
137. The beginning of atrial diastole coincides with the
 (1) End of ventricular systole
 (2) Beginning of ventricular diastole
 (3) Beginning of ventricular systole
 (4) Beginning of atrial systole
138. A girl 'X' was walking calmly down the road when all of sudden a snake appeared in front of her. The following physiological changes would have take place in her body, **except**
 (1) Excessive sweating
 (2) Dilation of pupils
 (3) Increase in heart rate
 (4) Decrease in cardiac output
139. Select the **incorrect** statement regarding regulation of respiration in humans.
 (1) Both chemosensitive area and the respiratory rhythm centre are present in medulla oblongata.
 (2) Change in CO₂ and H⁺ concentration can be recognised by receptors present in the aortic arch.
 (3) The role of oxygen in regulation of the respiratory rhythm is most significant.
 (4) Pneumotaxic centre is present in the pons region of the brain.
140. Which of the following is **incorrect** for cloning vector pBR322?
 (1) It has ampicillin resistance gene.
 (2) It has a special sequence called 'ori'.
 (3) It has specific recognition sites for the different restriction enzymes.
 (4) Selection of recombinants is always a single step process while using it.
141. Consider the given statements and select the **correct** option.
Statement (A): Heart of both humans as well as amphibians is neurogenic in nature.
Statement (B): Neural signals through the sympathetic nerve fibres increase the strength of ventricular contraction in humans.
 (1) Both statements (A) and (B) are correct
 (2) Both statements (A) and (B) are incorrect
 (3) Only statement (A) is incorrect
 (4) Only statement (B) is incorrect
142. Select the option that represents **correct** set of bones included under appendicular skeleton of humans.
 (1) Coxal bone, Sternum, Coccyx
 (2) Patella, Ischium, Scapula
 (3) Radius, Ulna, Atlas
 (4) Axis, Malleus, Stapes

143. *Bt* toxin gene has been introduced in plants in order to provide resistance against

- (a) Tobacco budworm and armyworm
- (b) Beetles and corn borers
- (c) Flies and mosquitoes

Choose the **correct** option.

- (1) Only (a) and (b)
- (2) Only (b) and (c)
- (3) Only (a) and (c)
- (4) (a), (b) and (c)

144. The anatomical unit of muscle is

- (1) Muscle fibre
- (2) Sarcomere
- (3) Myosin filament
- (4) Actin filament

145. Choose the **incorrect** statement.

- (1) Sucrose is a disaccharide made up of glucose and fructose.
- (2) Lecithin is a phosphorylated glyceride found in the cell membranes.
- (3) Only peptide bonds are involved in stabilizing tertiary structure of the proteins.
- (4) Lipids are not polymeric compounds.

146. Which of the following is characterised by three-horned face and quadrupedal locomotion?

- (1) *Tyrannosaurus*
- (2) *Triceratops*
- (3) *Stegosaurus*
- (4) *Brachiosaurus*

147. Select the **correct** set of animals that belong to the same phylum.

- (1) *Sycon*, *Spongilla*, *Scoliodon*
- (2) *Physalia*, *Pleurobrachia*, *Pennatula*
- (3) *Columba*, *Canis*, *Ctenoplana*
- (4) *Anopheles*, *Aedes*, *Apis*

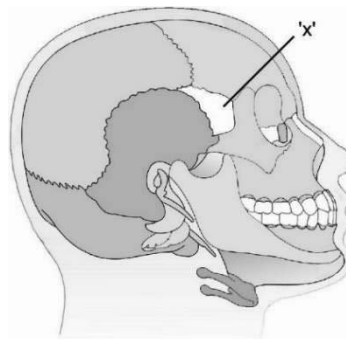
148. How many of the organisms given in the box below are uricotelic in nature?

Reptiles, Birds, Cartilaginous fishes, Aquatic insects, *Hydra*, Land snails

Select the **correct** option.

- (1) Three
- (2) Four
- (3) Five
- (4) Six

149. Which of the following does not hold true for the bone marked as 'x' in the figure given below?



- (1) It is an unpaired bone.
- (2) It is a cranial bone.
- (3) It is a facial bone.
- (4) It is a part of axial skeleton.

150. Which one of the following is **not** found in renal pyramid?

- (1) Collecting ducts
- (2) Loop of Henle
- (3) Vasa recta
- (4) Convoluted tubules

151. Match column I with column II w.r.t. humans and choose the **correct** option.

Column I	Column II
a. Hinge joint	(i) Between humerus and pectoral girdle
b. Pivot joint	(ii) Between carpal and metacarpal of thumb
c. Ball and socket joint	(iii) Between femur and tibia
d. Saddle joint	(iv) Between atlas and axis

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

152. Which of the following is **correct** w.r.t. repolarisation of axonal membrane?

- (1) Opening of voltage gated Na⁺ channels
- (2) Closure of voltage gated Na⁺ channels and opening of voltage gated K⁺ channels
- (3) Closure of voltage gated K⁺ channels
- (4) Closure of both voltage gated Na⁺ and K⁺ channels

153. All of the following ARTs involve *in vitro* fertilisation, **except**

- (1) ZIFT
- (2) ICSI
- (3) IUT
- (4) GIFT

154. Which of the following is **true** for organisms belonging to the class 'Aves'?

- (1) They have no glands
- (2) They are poikilothermous
- (3) Their forelimbs have scales and are modified for walking and clasping the tree branches
- (4) They have hollow long bones with air cavities present in them

155. The total number of disulphide bonds present in a molecule of monomeric antibody is

- (1) Ten
- (2) Sixteen
- (3) Fourteen
- (4) Twelve

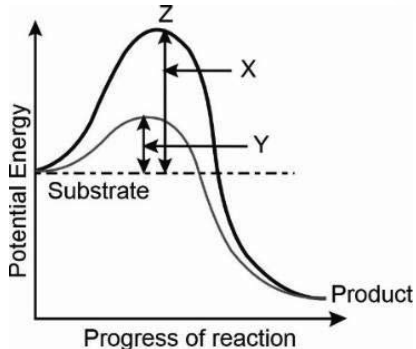
156. How many of the compounds given in the box exist(s) as quaternary structure of proteins and formed by two subunits of α -type and two subunits of β -type?

Myoglobin, Collagen, Insulin, Myosin, Haemoglobin

Select the **correct** option.

- (1) Three
- (2) One
- (3) Four
- (4) Five

157.



With respect to above graph, select the **correct** option.

- (1) 'Y' represents activation energy without an enzyme
- (2) 'Z' represents a stable and lowest energy state
- (3) 'X' represents activation energy in the presence of an enzyme
- (4) This graph represents an exothermic reaction

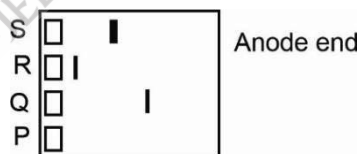
158. Choose the option which represents the **correct** sequence of passage of sperms in male frog.

- (1) Testes → Bidder's canal → Vasa efferentia → Urinogenital duct → Cloaca
- (2) Testes → Vasa efferentia → Bidder's canal → Urinogenital duct → Cloaca
- (3) Testes → Bidder's canal → Vasa efferentia → Rectum → Urinogenital duct
- (4) Testes → Vasa efferentia → Urinogenital duct → Bidder's canal → Cloaca

159. Although frogs have different modes of respiration but the structure commonly used by them in water, land and in unfavourable situations is

- (1) Lungs
- (2) Skin
- (3) Buccal cavity
- (4) Lungs and buccal cavity

160. In an experimental set up, three samples were taken. Sample 'A' has DNA fragments, each with size of 8 kb. Sample 'B' has DNA fragments each with size of 2 kb and sample 'C' has DNA fragments, each with size of 4 kb. These samples were subjected to gel electrophoresis and the result obtained is given below.



Which of the above lanes (P, Q, R, S) represents DNA fragments of sample 'A'?

- (1) Q
- (2) S
- (3) P
- (4) R

161. A biological response modifier activates the immune system and helps in destroying the tumor. It belongs to the _____ barrier of innate immunity.

Select the **correct** option to fill in the blank.

- (1) Physical
- (2) Cellular
- (3) Physiological
- (4) Cytokine

162. **Assertion (A):** In recombinant DNA technology, both the vector DNA and DNA of interest are cut by the same restriction endonuclease.
Reason (R): The same kinds of sticky ends are required to facilitate the action of DNA ligase.
 In the light of above statements, select 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) (A) is true, (R) is false
 - (4) Both (A) and (R) are false
163. For transformation of a bacterial cell, it has to be made competent because
- (1) Competent cells have modified DNA in their genome which help them to transform easily.
 - (2) Competent cells are able to take alien piece of DNA efficiently.
 - (3) Competent cells are able to take up the alien piece of DNA, modify and kill it.
 - (4) Competency keeps the cell wall rigid.
164. Vaccine which contains weakened pathogens or antigenic preparations provides
- (1) Natural active immunity
 - (2) Natural passive immunity
 - (3) Artificial active immunity
 - (4) Artificial passive immunity
165. All of the following statements are true w.r.t. tubectomy, **except**
- (1) It only blocks gamete transport not its production.
 - (2) Follicles within ovary develop normally.
 - (3) Reversibility is very poor.
 - (4) Females who undergo tubectomy do not menstruate
166. Select the **correct** match.
- | | |
|----------------------------|---------------------------------|
| (1) 50% of human sperms – | Contain 22 + X chromosomes |
| (2) Primary spermatocyte – | Haploid cell |
| (3) Secondary oocyte – | Diploid cell |
| (4) Spermatids – | Contain flagella and are motile |
167. If a human female has a 28-day menstrual cycle, then the highest level of estrogen in blood will be seen from
- (1) Day 5 to Day 9
 - (2) Day 13 to Day 14
 - (3) Day 17 to Day 19
 - (4) Day 3 to Day 7
168. Choose the **incorrect** statement w.r.t. human evolution.
- (1) The skull of baby chimpanzee is more like adult chimpanzee skull than adult human skull.
 - (2) The story of evolution of modern man appears to parallel evolution of human brain and language.
 - (3) Agriculture came around 10,000 years back and human settlements started.
 - (4) *Ramapithecus* was more man-like while *Dryopithecus* was more ape-like.
169. Which of the following structures allows passage of small amounts of urea into medullary interstitium to keep up the osmolarity?
- (1) Descending limb of Henle's loop
 - (2) Collecting duct
 - (3) Ascending limb of Henle's loop
 - (4) Distal convoluted tubule
170. For maintenance of osmolarity of body fluids, descending limb of loop of Henle _____ the filtrate whereas ascending limb of loop of Henle _____ the filtrate majorly.
- Select the **correct** option to fill in the blanks respectively.
- (1) Dilutes ; Concentrates
 - (2) Concentrates ; Dilutes
 - (3) Reabsorbs ; Secretes
 - (4) Secretes ; Reabsorbs
171. AV node delays impulses transmitted from SAN by 0.1 second so that
- (1) Ventricles can empty completely
 - (2) The atria can empty completely
 - (3) The atria get filled completely
 - (4) Half the blood present in the atria can enter into ventricles

172. Cerebrum wraps around 'X' present in human brain which is a major coordinating centre for sensory and motor signalling.
Identify 'X' and select the **correct** option.
- (1) Cerebellum
 - (2) Thalamus
 - (3) Hypothalamus
 - (4) Pons
173. Select the statement which is **true** for normal inspiration in humans.
- (1) A dome shaped structure present on the lower side of thoracic chamber contracts and increases the volume of thoracic cavity in the dorso-ventral axis.
 - (2) External inter-costal muscles lift up the ribs and the sternum causing an increase in the volume of thoracic chamber in the antero-posterior axis.
 - (3) Volume of thoracic cavity increases which decreases the intra-pulmonary pressure less than the atmospheric pressure.
 - (4) Air enters the lungs *via* passive process.
174. Which of the following factors favour the formation of oxyhaemoglobin?
- (1) High pO_2 , High pCO_2 , Low pH, Higher temperature
 - (2) High pO_2 , Low pCO_2 , High pH, Lower temperature
 - (3) Low pO_2 , High pCO_2 , High pH, Higher temperature
 - (4) High pO_2 , Low pCO_2 , Low pH, Higher temperature
175. Flow of blood through the below mentioned pathway in humans is included under
- $$\text{Left ventricle} \xrightarrow{\text{Aorta}} \text{Body tissues} \xrightarrow[\text{Cava}]{\text{Vena}} \text{Right atrium}$$
- Choose the **correct** option.
- (1) Coronary circulation
 - (2) Pulmonary circulation
 - (3) Lymphatic circulation
 - (4) Systemic circulation
176. Identify the organism having following features.
- (i) Endoskeleton made of calcareous ossicles
 - (ii) Adults are radially symmetrical
 - (iii) Presence of complex digestive system
 - (iv) Presence of water vascular system
- Select the **correct** option.
- (1) *Sycon*
 - (2) *Antedon*
 - (3) *Pila*
 - (4) *Pleurobrachia*
177. Read the following statements.
- Statement A:** Zona pellucida is a non-cellular layer secreted by the secondary oocyte.
- Statement B:** Zona pellucida usually remains intact until the embryo reaches the uterus.
- Choose the **correct** option.
- (1) Only statement A is correct
 - (2) Only statement B is correct
 - (3) Both statements A and B are incorrect
 - (4) Both statements A and B are correct
178. The most primitive craniates from the options given below are
- (1) Cephalochordates
 - (2) Urochordates
 - (3) Cyclostomes
 - (4) Gnathostomes
179. Choose the **incorrect** match regarding the parts of reproductive system of a male cockroach and their functions.
- | | | |
|---------------------------|---|------------------------------------|
| (1) Seminal vesicles | – | Secrete outer layer of spermatheca |
| (2) Mushroom shaped gland | – | Accessory reproductive gland |
| (3) Testes | – | Formation of sperms |
| (4) Vas deferens | – | Transportation of sperms |
180. Human insulin has been produced by bacterial cells in recombinant DNA technology.
Which special feature of genetic code is particularly responsible for the successful production of human insulin in bacteria?
- (1) Unambiguous nature of genetic code
 - (2) Genetic code is degenerate
 - (3) Genetic code is nearly universal
 - (4) Genetic code is specific