11/04/2025

Code-D

Aakash
Medical | IIT-JEE | Foundations

Corporate Office : AESL, 3rd Floor, Incuspaze Campus-2, Plot No. 13, Sector-18,
Udyog Vihar, Gurugram, Haryana - 122015, ***Ph.***011-47623456

MM : 720 Final Test Series(P2)-2024-25_Test-05D **Time : 180 Min.**

Topics Covered:
Physics: Electric Charges and Fields, Electrostatic Potential and Capacitance, Current Electricity, Moving Charges and Magnetism, Magnetism and Matter
Chemistry: The p-Block Elements (Group-13 & 14), Organic Chemistry-(Some Basic Principles and Techniques), Hydrocarbons
Botany: Cell: The Unit of Life, Cell Cycle and Cell Division, Photosynthesis in Plants
Zoology: Body Fluids and Circulation, Excretory Products and Their Elimination

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. A charged particle is released from rest in a uniform electric field and after 2 s, its kinetic energy becomes 50 J. Find KE of the particle after 4 second of release.

(1) 50 J

(2) 100 J

(3) 150 J

(4) 200 J

2. An electric point charge q = 10 μC is placed at origin. Calculate electric potential due to the charge at point P(8 m, 6 m) in free space.

(1) 9 V

(2) 9 kV

(3) 18 V

(4) 18 kV

3. The percentage increase in the magnetic field B when the space within the current carrying toroid is filled with Aluminium, (Assume the susceptibility of aluminum to be equal to 2×10^{-5}) is

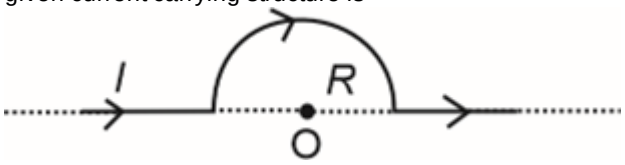
(1) .02

(2) .002

(3) 0.2

(4) 0.0002

4. Magnetic field at the centre O of semicircular loop in the given current carrying structure is



(1) $\frac{\mu_0 I}{4R}$ inward

(2) $\frac{\mu_0 I}{4R}$ outward

(3) $\frac{\mu_0 I}{4R} + \frac{\mu_0 I}{2\pi R}$, inward

(4) $\frac{\mu_0 I}{4R} + \frac{\mu_0 I}{2\pi R}$, outward

5. Two long straight parallel wires A and B carrying current of 10 A and 5 A respectively in same direction are separated by a distance of 5 cm. The force on 20 cm section of wire B is

(1) $2 \times 10^{-5}\ \text{N},\ \text{attractive}$

(2) $2 \times 10^{-5}\ \text{N},\ \text{repulsive}$

(3) $4 \times 10^{-5}\ \text{N},\ \text{attractive}$

(4) $4 \times 10^{-5}\ \text{N},\ \text{repulsive}$

6. How many dry cells each having emf of 2 V and internal resistance 0.5 Ω must be joined in series across an external resistance of 10 Ω so as to send a current of 1.5 A through the circuit.

(1) 5

(2) 12

(3) 30

(4) 16

7. For a paramagnetic substance

(1) $\chi_m > 0, \mu_r > 1$

(2) $\chi_m > 0, \mu_r < 1$

(3) $\chi_m < 0, \mu_r > 1$

(4) $\chi_m < 0, \mu_r < 1$

8. A short magnetic dipole has dipole moment of 10^{-2} A m^2 and moment of inertia of 4 × 10^{-4} kg m^2. It performs 2 oscillations in 4 s. What is the magnitude of magnetic field? (Take $\pi^2 = 10$)

(1) 40 T

(2) 4 T

(3) 0.4 T

(4) 0.04 T

9. A 6 μF capacitor is charged by a 10 V battery. The capacitor is then disconnected from battery and connected to another uncharged 3 μF capacitor. Final charge on 6 μF capacitor will be

(1) 60 μC

(2) 30 μC

(3) 40 μC

(4) 20 μC

10. Consider the following statements and choose the set of incorrect statements.
Statement I : Electrostatic potential increases in the direction of electric field.
Statement II : Two equipotential surfaces can intersect for complex charge configuration.
Statement III. Electrostatic potential energy of a system of point charges can be zero.

(1) III only

(2) I and II only

(3) I and III only

(4) II and III only

11. A dipole has dipole moment 10^{-9} C m. What is electric potential at a point 5 cm from center of dipole making an angle of 53° with dipole axis?

(1) 1.5 kV

(2) 2.16 kV

(3) 80 kV

(4) 27 kV

12. Resistivity of the conductor changes with

(1) Change in length of conductor

(2) Change in temperature

(3) Change in cross-sectional area

(4) Change in direction of current

13. The period of oscillation of a magnet in a vibration magnetometer is 4 s. The period of oscillation of another magnet whose magnetic moment is four times and moment of inertia is same as that of the first magnet is

(1) 1 s

(2) 2 s

(3) 4 s

(4) 8 s

14. A square loop of side length '*a*' carrying a current *I* is placed in a uniform magnetic field B_0 with its plane perpendicular to magnetic field. The torque on the loop is

(1) Ia^2B_0

(2) $2Ia^2B_0$

(3) $I\pi a^2B_0$

(4) Zero

15. A parallel plate capacitor (*C*) is charged by a battery of emf *V* and then it is disconnected. Now the plates of capacitor are moved away from each other, then
(A) Charge stored in it increases
(B) The energy stored in it increases
(C) Its capacitance decreases
(D) The ratio of charge to capacitance remains the same
(E) The ratio of charge to potential difference decreases.
The correct statement(s) is/are

(1) A , B and D only

(2) B, C and E only

(3) B, C, D and E only

(4) C, D and E only

16. Match Column -I with Column - II (All the symbols have their usual meaning).

Column - I	**Column - II**
(A) Ampere's circuital law	(i) $\left(\vec{M}\times\vec{B}\right)$
(B) Force per unit length between parallel current carrying wires	(ii) $q\left(\vec{E}+\vec{v}\times\vec{B}\right)$
(C) Lorentz force	(iii) $\frac{\mu_0 i_1 i_2}{2\pi d}$
(D) Torque on a circular current carrying loop placed in uniform magnetic field	(iv) $\oint \vec{B}.d\vec{l}=$ $\mu_0 i_{enclosed}$

(1) A → iv, B → iii, C → i, D → ii

(2) A → iv, B → iii, C → ii, D → i

(3) A → ii, B → i, C → iii, D → iv

(4) A → i, B → iii, C → ii, D → iv

17. An infinite long straight wire has linear charge density λ = 1.5×10^4 C m^{-1}. The electric force experienced by a charge *q* = 10 C at perpendicular distance of 10 m from axis of wire, is

(1) 2.7×10^{13} N

(2) 27×10^{13} N

(3) 13.5×10^{13} N

(4) 13.5×10^{14} N

18. The electric potential (in volt) at a point (*x*, *y*) is given by $V = -x^2y - 2x$. The electric field at point (1 m, 2 m) is (in V/m)

(1) $6\hat{i}+\hat{j}$

(2) $6\hat{i}-\hat{j}$

(3) $6\hat{i}+4\hat{j}$

(4) $6\hat{i}+2\hat{j}$

19. A charge *Q* is distributed uniformly in a non-conducting solid sphere. Then the electric field at any point *r* where *r* < *R* (*R* is radius of sphere) varies as

(1) r^{-2}

(2) r^{-1}

(3) r^{-3}

(4) *r*

20. Two resistances are joined in parallel such that their resultant is 2 Ω . The value of one of the resistance may be

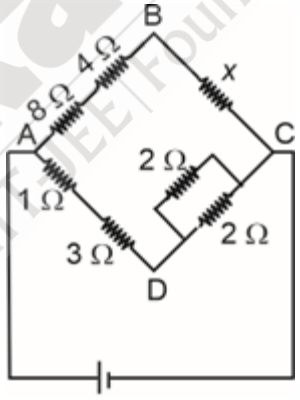
(1) 3 Ω

(2) 1 Ω

(3) 1.5 Ω

(4) 0.5 Ω

21. In the arrangement of resistances shown in the diagram, the potential difference between *B* and *D* will be zero, when the resistance X is



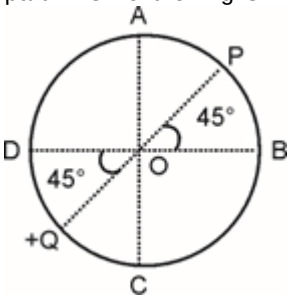
(1) 2 Ω

(2) 3 Ω

(3) 6 Ω

(4) 12 Ω

22. A thin conducting and uniformly charged ring of radius *R* is given a charge +*Q*. The electric field at the centre *O* of the ring due to the charge on the part APB of the ring is E_0. The electric field at the centre due to the charge on the other part ADCB of the ring is



(1) E_0 towards *OP*

(2) E_0 towards *OQ*

(3) $3E_0$ towards *OP*

(4) $3E_0$ towards *OQ*

23. A charged particle is projected in magnetic field $\vec{B} = \left(4\hat{i} + 3\hat{j}\right) \times 10^{-3}$ T. The acceleration of particle is found to be $\vec{a} = \left(x\hat{i} + 3\hat{j}\right)$ m s^{-2}. The value of *x* is

(1) –9/4

(2) –3/2

(3) –5/4

(4) 4/9

24. The magnetic field $d\vec{B}$ due to a small current element $id\vec{l}$ at a distance $\vec{r}$ is

(1) $d\vec{B} = \frac{\mu_0}{2\pi}\left(\frac{id\vec{l}\times\vec{r}}{r^2}\right)$

(2) $d\vec{B} = \frac{\mu_0}{4\pi}\left(\frac{id\vec{l}\times\vec{r}}{r^2}\right)$

(3) $d\vec{B} = \frac{\mu_0}{2\pi}\left(\frac{id\vec{l}\times\vec{r}}{r}\right)$

(4) $d\vec{B} = \frac{\mu_0}{4\pi}\left(\frac{id\vec{l}\times\vec{r}}{r^3}\right)$

25. The magnetic moment of a current carrying circular coil of radius (*r*) number of turns (*N*) is *M*. If radius of the coil is doubled keeping number of turns unchanged then magnetic moment becomes (Assume current is constant)

(1) *M*

(2) 2*M*

(3) 4*M*

(4) $\frac{M}{4}$

26. A current carrying loop is placed in a uniform magnetic field. The torque acting on it depends on

(1) Magnetic field

(2) Current in the loop

(3) Area of the loop

(4) All of these

27. A bubble is charged to a potential equal to 6 V. If its radius is tripled, then the potential of the bubble becomes

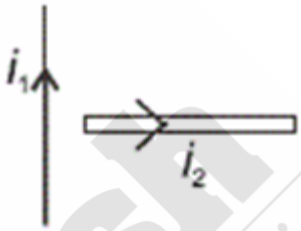
(1) $\frac{1}{2}$ V

(2) 1 V

(3) 2 V

(4) 18 V

28. A thin rod, carrying current i_2 is placed near a long straight wire carrying current i_1 in the plane of rod as shown in figure. The motion of rod is



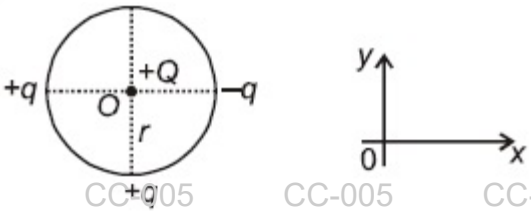
(1) Only translatory

(2) Only rotatory

(3) Translatory as well as rotatory

(4) Will not experience any force

29. Three charges +*q*, +*q* and –*q* are placed on the circumference of a circle of radius *r*. The net force on charge +*Q* placed at the centre of the circle as shown in the figure will be $\left(\text{where } K = \frac{1}{4\pi\varepsilon_0}\right)$



(1) $\frac{KQq}{r^2}\hat{j}$

(2) $\frac{2KQq}{r^2}\hat{i} + \frac{KQq}{r^2}\hat{j}$

(3) $\frac{-2KQq}{r^2}\hat{i} + \frac{KQq}{r^2}\hat{j}$

(4) $\frac{-KQq}{r^2}\hat{i} - \frac{KQq}{r^2}\hat{j}$

30. A charge particle of mass *m* and charge *q* travels on a circular path of radius *r* in perpendicular magnetic field *B*. The time taken by the particle to complete half revolution is

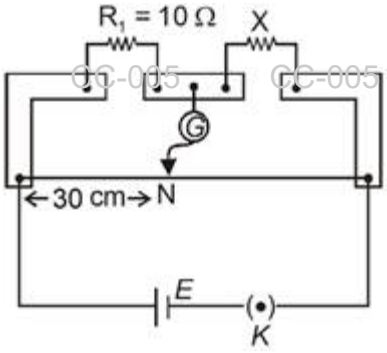
(1) $\frac{\pi qB}{m}$

(2) $\frac{2\pi qB}{m}$

(3) $\frac{2\pi m}{qB}$

(4) $\frac{\pi m}{qB}$

31. In the metre bridge experiment, the null point is obtained at *N*. The value of unknown resistance *X* will be



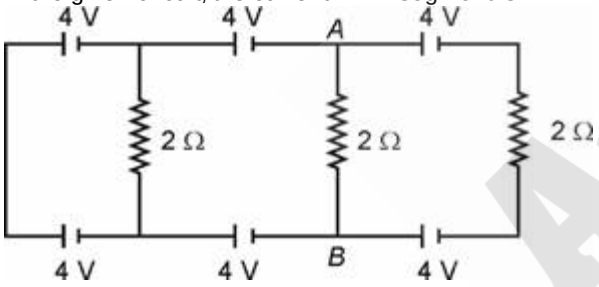
(1) 60 Ω

(2) 40 Ω

(3) 23.3 Ω

(4) 13.2 Ω

32. In the given circuit, the current in *AB* segment is



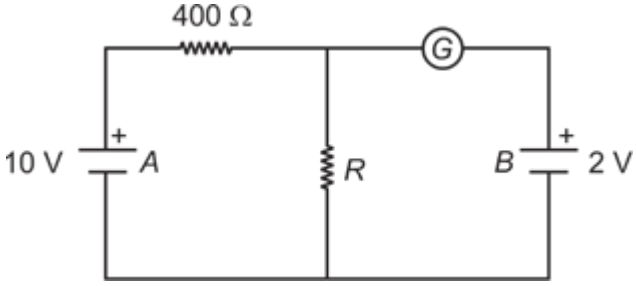
(1) 0.2 A

(2) 2 A

(3) 0.4 A

(4) 0 A

33. In the circuit, the galvanometer *G* shows zero deflection. If the batteries *A* and *B* have negligible internal resistances, the value of the resistor *R* will be



(1) 200 Ω

(2) 100 Ω

(3) 400 Ω

(4) 1000 Ω

34. A 10 m long wire of 20 Ω resistance is connected with a battery of 3 volt emf (negligible internal resistance) and a 10 Ω resistance joined in series to it. Potential gradient along the wire in volt per metre is

(1) 0.02

(2) 0.3

(3) 0.2

(4) 1.3

35. A dipole of dipole moment $\vec{P}$ is rotated inside a uniform electric field $\vec{E}$ from its stable equilibrium position to unstable equilibrium position slowly. Then work done by external agent is

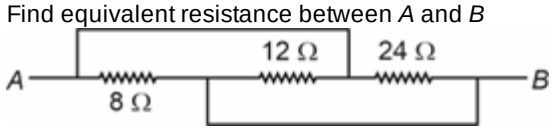
(1) – 2*PE*

(2) – *PE*

(3) + 2*PE*

(4) + *PE*

36. Find equivalent resistance between *A* and *B*



(1) 44 Ω

(2) 4 Ω

(3) 12 Ω

(4) 18 Ω

37. *n* identical resistor each of resistance 20 Ω are connected in parallel to each other. If equivalent resistance is 5 Ω, then the value of *n* is

(1) 4

(2) 3

(3) 2

(4) 1

38. A wire of resistance 10 Ω is stretched to double its length and then bent in a form of circle. The equivalent resistance between two diametrically opposite point will be

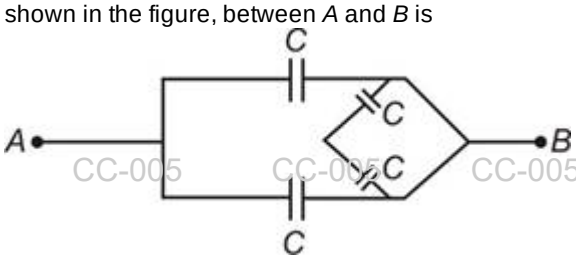
(1) 5 Ω

(2) 10 Ω

(3) 40 Ω

(4) 20 Ω

39. The equivalent capacitance of combination of capacitors as shown in the figure, between *A* and *B* is



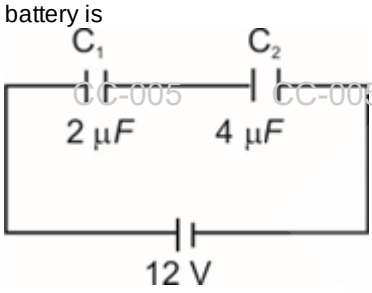
(1) *C*

(2) 2*C*

(3) 4*C*

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

40. Two capacitors C_1 and C_2 are connected in series with a battery of 12 V as shown in the figure. Charge supplied by battery is



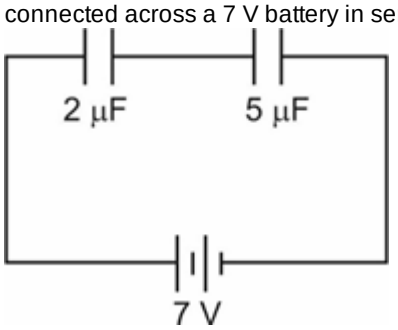
(1) 4 μC

(2) 8 μC

(3) 12 μC

(4) 16 μC

41. Two capacitors of capacitance $2\ \mu F$ and $5\ \mu F$ are connected across a 7 V battery in series as shown in figure.



After the capacitors are fully charged, the battery is replaced by a closed switch.
The common potential (V_C) across the two capacitors is

(1) $\frac{7}{10}$ V

(2) Zero

(3) 7 V

(4) $\frac{7}{2}$ V

42. Which of the given statement is correct?

(1) Equipotential surface for positive point charge is concentric spheres

(2) Equipotential surface for negative point charge is concentric spheres

(3) Equipotential surface for uniform electric field is parallel and equispaced planes perpendicular to electric field intensity

(4) All of these

43. **Assertion (A) :** Electric force on the positive charge act in the direction of electric field.
Reason (R) : Electric field intensity vector due to a point charge will be different at different point.
In the light of above statements, select the correct option

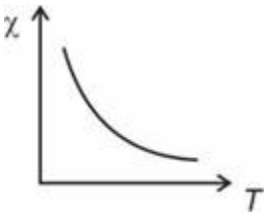
(1) Both (A) and (R) are true, (R) correct explanation of (A)

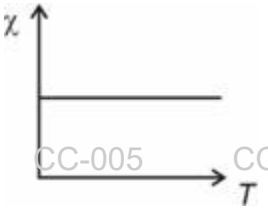
(2) Both (A) and (R) are true, but (R) is not the correct explanation of (A)

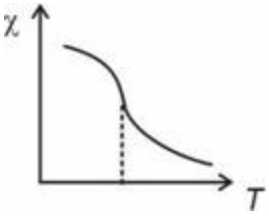
(3) (A) is true, (R) is false

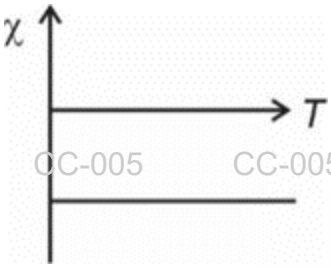
(4) (A) is false, (R) is true

44. The variation of magnetic susceptibility (χ) with absolute temperature (T) for a ferromagnetic substance is best represented by

(1) 

(2) 

(3) 

(4) 

45. The magnetic field lines inside a bar magnet

(1) Are from north-pole to south-pole of the magnet

(2) Are rectangular in shape

(3) Depend upon the area of cross-section of the bar magnet

(4) Are from south-pole to north-pole of the magnet

CHEMISTRY

46. Consider the following statements:
Statement I: But-2-ene has higher heat of hydrogenation as compared to But-1-ene.
Statement II: More stable alkene has higher heat of hydrogenation.
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

47. In the Carius method of estimation of bromine, 0.5 g of an organic compound gave 0.188 g of AgBr. The percentage of bromine in the compound is

(1) 16%

(2) 8%

(3) 32%

(4) 24%

48. The number of primary carbon atoms in neopentyl chloride are

(1) 1

(2) 2

(3) 3

(4) 4

49. Consider the following reaction and the statement about product B

$$CaC_2 \xrightarrow[\Delta]{H_2O} A \xrightarrow[873\,K]{\text{Red hot Fe tube}} B$$

(i) B undergoes ozonolysis to form glyoxal
(ii) B undergoes Friedel crafts acylation to form a ketone
(iii) B on treatment with excess of chlorine in the presence of anhydrous $AlCl_3$ and in cold and dark conditions can be chlorinated to hexachlorobenzene.
Choose the correct statement.

(1) (i) and (ii) only

(2) (ii) and (iii) only

(3) (iii) only

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

50. Match the column I of the given reactions with their respective types given in column II.

	Column I		Column II
a.	Ethene + cold concentrated sulphuric acid →	(i)	Free radical addition
b.	Propene + HBr $\xrightarrow{(C_6H_5CO)_2O_2}$	(ii)	β-elimination
c.	Chloroethane $\xrightarrow[\Delta]{\text{alc. KOH}}$	(iii)	Electrophilic addition
d.	Benzene $\xrightarrow[\Delta]{\text{fuming } H_2SO_4}$	(iv)	Electrophilic substitution

Choose the correct match from the option given below:

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

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

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

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

51. Dihedral angle in eclipsed conformation of ethane is

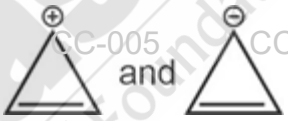
(1) 60°

(2) 90°

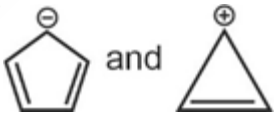
(3) 120°

(4) 0°

52. The pair of aromatic species is

(1)  and

(2)  and

(3)  and

(4)  and

53. Consider the following statements.
Statement I: First ionisation enthalpy of the group 14, elements decrease in the order of
C > Si > Ge> Pb > Sn
Statement II: Silicon has the higher boiling point than that of Germanium.
In the light of the 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

54. Choose the incorrect statement about boric acid

(1) It is a weak protonic acid

(2) On heating above 370K, it first forms HBO_2 & on further heating yields B_2O_3.

(3) It is a sparingly soluble in water but highly soluble in hot water.

(4) It has a layer structure in which planar BO_3 units are joined by hydrogen bonds.

55. Total number of 3 centre-2 electron bonds in one molecule of diborane is

(1) 1

(2) 2

(3) 3

(4) 4

56. Match the column I with column II

	Column I		Column II
a.	Producer gas	(i)	$Na_2B_4O_7\ 10H_2O$
b.	Water gas	(ii)	$B_3N_3H_6$
c.	Inorganic benzene	(iii)	$CO + H_2$
d.	Borax	(iv)	$CO + N_2$

Choose the correct match form the options given below

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

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

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

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

57. The correct order of relative stability of +1 oxidation state among the elements of group 13 is

(1) Al < Ga < In < Tl

(2) Tl < In < Ga < Al

(3) Al < In < Ga < Tl

(4) In < Tl < Ga < Al

58. Choose the incorrect statement about CO.

(1) It is produced by incomplete combustion of fuel

(2) It can form adduct with diborane

(3) It forms carboxy haemoglobin in blood which is less stable than oxyhaemoglobin

(4) It reduces oxygen carrying capacity of blood

59. Choose the incorrect match

(1) GeO – Acidic oxide

(2) SnO_2 – Amphoteric oxide

(3) GeO_2 – Neutral Oxide

(4) SiO_2 – Acidic oxide

60. Which of the following elements is unable form MF_6^{3-} ion?

(1) Boron

(2) Aluminium

(3) Galium

(4) Indium

61. The tendency of BF_3, BCl_3 and BBr_3 to behave as Lewis acid decreases as

(1) $BCl_3 > BBr_3 > BF_3$

(2) $BF_3 > BCl_3 > BBr_3$

(3) $BBr_3 > BCl_3 > BF_3$

(4) $BCl_3 > BF_3 > BBr_3$

62. The basic structural unit of ortho silicates is

(1) SiO_4^{4-}

(2) SiO_3^{2-}

(3) SiO_4^{2-}

(4) SiO^-

63. Incorrect statement regarding C_{60} is

(1) It is called Buckminsterfullerene

(2) It contains twenty six-membered rings and twelve five-membered rings

(3) All the carbon atoms are sp^3 hybridised

(4) A six membered ring is fused with six or five membered rings but a five membered ring can only fuse with six membered rings

64. Match the column I of the pair of organic compounds with the isomerism exhibited by them given in column II.

	Column I		Column II
a.	Methylcyanide and methylisocyanide	(i)	Chain Isomerism
b.	N-ethylethanamine and N-methylpropanamine	(ii)	Position Isomerism
c.	o-Cresol and m-Cresol	(iii)	Metamerism
d.	Isopentane & neopentane	(iv)	Functional group Isomerism

Choose the correct match.

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

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

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

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

65. A compound of boron 'X' has the structure similar to graphite. X is

(1) B_2H_6

(2) $NaBH_4$

(3) B_4C

(4) BN

66. Total number of geometrical isomers possible in penta-1,3-diene is

(1) 4

(2) 6

(3) 2

(4) 8

67. Substrate $\xrightarrow[(major)]{Reagent(s)} trans-But-2-en\ e$

The correct set of substrate and reagent are

(1) but-2-yne and sodium in liquid ammonia

(2) but-1-yne and lithium in liquid ammonia

(3) but-1-yne and ammonium hydroxide solution

(4) but-2-yne and palladium with barium sulphate

68. Which of the following group increases the reactivity of the benzene towards electrophilic substitution reaction?

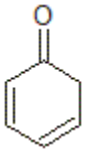
(1) $-OCH_3$

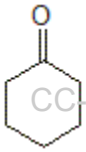
(2) $-NO_2$

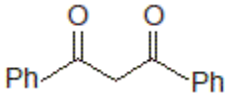
(3) –Cl

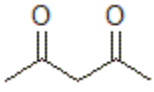
(4) –CHO

69. Which compound will have highest enol content?

(1) 

(2) 

(3) 

(4) 

70. Consider the following statements about alkynes.
I. All alkynes are colourless
II. These are immiscible in water
III. Propyne evolves NH_3 gas on reaction with $NaNH_2$
Correct statements among the following are

(1) I and II only

(2) II and III only

(3) I and III only

(4) I, II and III

71. Consider the following reactions

$$2CH_4 + O_2 \xrightarrow[100\ atm]{Cu\ /523\ K} A$$

$$CH_4 + O_2 \xrightarrow[\Delta]{Mo_2\ O_3} B$$

The products A and B respectively are

(1) Methanol and Methanal

(2) Methanol and Methanoic acid

(3) Ethanol and Methanol

(4) Ethanoic acid and Methanol

72. Which of the following statements is/are correct regarding Kolbe's electrolytic process?
A. Alkanes containing even number of C–atoms are prepared.
B. Sodium /Potassium salts of carboxylic acids are taken as substrate.
C. Methane can be prepared by this method.
D. H_2 gas is liberated at anode.
The correct option is

(1) A and B only

(2) B and C only

(3) A and D only

(4) B only

73. Which of the following statements is/are correct?
I. Terminal alkynes liberate H_2 on reaction with sodium metal.
II. Ethyne is more acidic in nature than ethene.
III. Ethyne on warming with mercuric sulphate and dilute sulphuric acid at 333 K gives ethanol.
IV. Ethyne on reaction with excess HBr gives 1, 2-dibromoethane as major product.

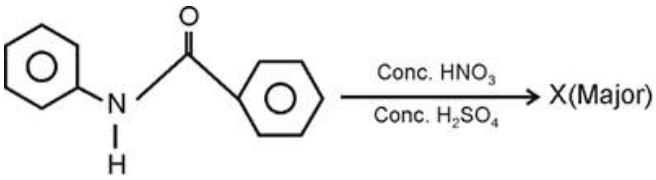
(1) III only

(2) II, III and IV only

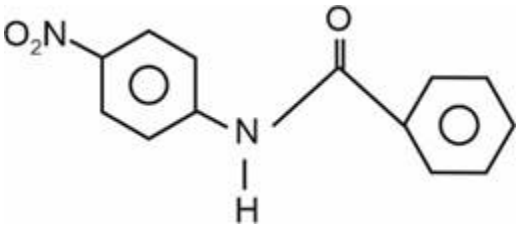
(3) II and IV only

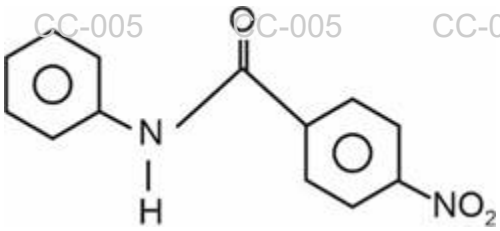
(4) I and II only

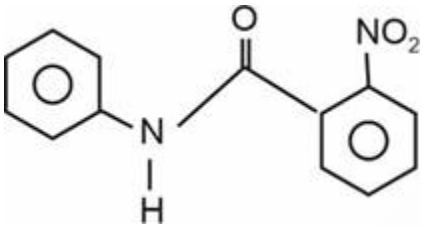
74.

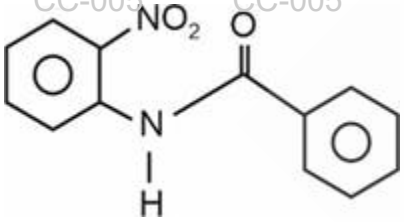


The major product X is

(1) 

(2) 

(3) 

(4) 

75. Given below are the two statements: One is labelled as **Assertion (A)** and other is labelled as **Reason (R)**.
Assertion (A): Peroxide effect is not observed in addition of HCl and HI in unsymmetrical alkenes.
Reason (R): HCl bond being stronger than HBr is not cleaved by free radical whereas H-I bond is weaker and iodine free radicals combine to form I_2 molecules.
Choose the correct option.

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

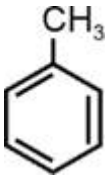
(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)

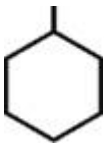
(3) (A) is true but (R) is false

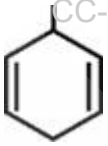
(4) Both (A) and (R) are false

76. Identify the major product formed in the following reaction.

$$n - C_7H_{16} \xrightarrow[773\,K,\,10-20\ atm]{V_2O_5} A\ (Major)$$

(1) 

(2) 

(3) 

(4) 

77. Given below are two statements one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A) : Cyclooctatetraene is non-aromatic compound.
Reason(R): Cyclooctatetraene has $4n\pi$ electrons.
In the light of above statements choose the correct answer.

(1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion

(2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion

(3) Assertion is true statement but Reason is false

(4) Both Assertion and Reason are false statements

78. Given below are the two statements
Statement I: Melting point of neopentane is higher than hexane.
Statement II: Boiling point of isopentane is higher than neopentane
In the light of above statements, choose the correct answer

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

(2) Both statement I and statement II are correct

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

(4) Both statement I and statement II are incorrect

79. Given below are two statements
Statements (I) : Vicinal dihalides on heating with zinc dust form an alkene.
Statements (II) : Dihalides in which two halogen atoms are attached to two adjacent carbon atoms are known as vicinal dihalides.
In the light of above statements choose the correct option

(1) Both the statements I and II are correct

(2) Both the statements I and II are incorrect

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

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

80. The formula of ammonium phosphomolybdate is

(1) $(NH_4)_3PO_2 \cdot 12\ MoO_3$

(2) $(NH_4)_3PO_4 \cdot 12\ MoO_3$

(3) $(NH_4)_3PO_4 \cdot 2\ MoO_3$

(4) $(NH_4)_3PO_3 \cdot 10\ MoO_3$

81. In the Kjeldahl's method for estimation of nitrogen present in a compound, the ammonia evolved from 0.75 g of sample is neutralized by 100 ml of 0.1 M H_2SO_4. The percentage of nitrogen in the compound is

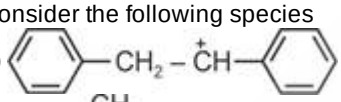
(1) 31.58%

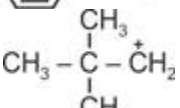
(2) 41.48%

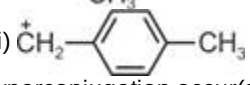
(3) 26.42%

(4) 37.33%

82. Consider the following species

(i) 

(ii) 

(iii) 

Hyperconjugation occur(s) in

(1) (i) only

(2) (ii) & (iii) only

(3) (i) & (iii) only

(4) (i), (ii) & (iii)

83. Which of the following statements is not correct regarding resonance?

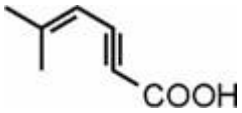
(1) Resonance structures are hypothetical and do not represent real molecule

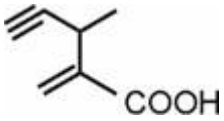
(2) Resonance structures contribute to the actual structure in proportion to their stability

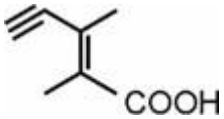
(3) The energy of actual structure is lower than that of any of the resonance structure

(4) The difference in energy between the actual structure and highest energy resonance structure is called resonance energy

84. Structure of the compound whose IUPAC name is 2,3-dimethylpent-2-en-4-ynoic acid is

(1) 

(2) 

(3) 

(4) 

85. Which of the following organic compounds has same hybridization as its combustion product –(CO_2)?

(1) Ethane

(2) Ethyne

(3) Ethene

(4) Ethanol

86. Match the species given in List-I with their respective colour given in List-II.

List-I	List-II
a. $(NH_4)_3PO_4 \cdot 12MoO_3$	(i) Violet
b. $[Fe(CN)_5NOS]^{4-}$	(ii) Blood red
c. $[Fe(SCN)]^{2+}$	(iii) Prussian blue
d. $Fe_4[Fe(CN)_6]_3 \cdot xH_2O$	(iv) Yellow

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

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

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

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

87. Consider the following statements.
Statement I : Dimethyl ether and ethanol are functional group isomers of each other.
Statement I : Ethanol does not show position isomerism.
In the light of above statements 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

88. Consider the structure of thiophene:

Total number of electrons in conjugation is

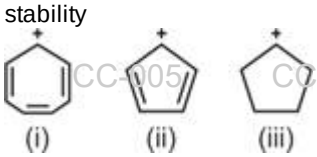
(1) 4

(2) 6

(3) 8

(4) 2

89. Arrange the given carbonium ions in increasing order of stability



(i) (ii) (iii)

(1) (iii) > (ii) > (i)

(2) (ii) > (iii) > (i)

(3) (i) > (iii) > (ii)

(4) (ii) > (i) > (iii)

90. In Duma's method for estimation of nitrogen, 0.28 g of an organic compound gives 60 ml of nitrogen measured at 27°C and 725 mm of Hg pressure. If the aqueous tension at 27ºC is 25 mm of Hg then the percentage composition of nitrogen in the compound will be

(1) 17.46%

(2) 22.45%

(3) 16.76%

(4) 18.23%

BOTANY

91. State True (T) or False (F) to the given statements and select the **correct** option.
(A) Anton von Leeuwenhoek was the first person who discovered living cells
(B) Matthias Schleiden, studied different types of animal cells and reported that cells had thin outer layer known as plasma membrane
(C) The cytoplasm is the main arena of cellular activities in eukaryotes only.
(D) Activities of an organism are the outcome of sum total of activities and interactions of its constituent cells.

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

(1) (1)

(2) (2)

(3) (3)

(4) (4)

92. A prokaryotic structure which is formed by the invagination of plasma membrane into the cell is

(1) Plasmid

(2) Pili

(3) Mesosomes

(4) Fimbriae

93. Select the **mismatched** pair.

(1) Pili – Involved in mating process

(2) Fimbriae – Help in attaching the bacteria to rocks

(3) Flagella – Help in motility

(4) Plasmid – Genomic DNA that confers unique phenotypic characters to bacteria

94. Identify the **incorrect** statement w.r.t. ribosomes.

(1) They are non-membrane bound organelles found in all living cells.

(2) They are sites of protein synthesis.

(3) They are composed of mRNA and protein

(4) They are associated with the plasma membrane of the prokaryotic cell

95. At high light intensities C_3 plants show saturation of photosynthetic process when CO_2 concentration is

(1) About 360 $\mu l L^{-1}$

(2) Beyond 450 $\mu l L^{-1}$

(3) About 300 $\mu l L^{-1}$

(4) About 400 $\mu l L^{-1}$

96. Which of the following statements is **not** correct w.r.t. centriole?

(1) They help in the formation of basal bodies.

(2) They form the spindle fibres that give rise to spindle apparatus during cell division.

(3) They form aster in all eukaryotes

(4) They are found in animal cells, fungi and algae.

97. Which one of the following plastid is involved in storage of fats and oils in castor?

(1) Amyloplast

(2) Elaioplasts

(3) Aleuroplast

(4) Chromoplast

98. Identify the pair of organelles involved in protein synthesis and modification and are included in endomembrane system.

(1) Lysosomes and Ribosomes

(2) Mitochondria and microbodies

(3) Golgi bodies and Endoplasmic reticulum

(4) Lysosomes and chloroplast

99. Read the following statements and select the **correct** option.
Statement (A): Interphase is a long, non-dividing, growing phase of the cell cycle.
Statement (B): DNA replication do not occur during interkinesis.

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

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

(3) Only statement (A) is correct

(4) Only statement (B) is correct

100. All of the following get duplicated in G_2 phase, **except**.

(1) Mitochondria

(2) Golgi bodies

(3) Chloroplast

(4) Chromosome

101. Match **Column I** with **Column II** and select the **correct** option.

	Column I		**Column II**
(a)	Prophase	(i)	Mitotic spindle disappears
(b)	Metaphase	(ii)	Formation of interzonal fibre
(c)	Anaphase	(iii)	Spireme stage
(d)	Telophase	(iv)	Congression of chromosomes

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

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

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

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

102. The enzyme recombinase is required at which stage of meiosis?

(1) Zygotene

(2) Pachytene

(3) Leptotene

(4) Diplotene

103. In oocytes of some vertebrates, which of the following stage in meiosis can lasts for years?

(1) Leptotene

(2) Zygotene

(3) Pachytene

(4) Diplotene

104. Meiosis differs from mitosis as in former

(1) Prophase is short and is without sub-stages.

(2) Karyokinesis occurs twice, but DNA replicates once only.

(3) There is no pairing of homologous chromosomes.

(4) Daughter cells have same number of chromosomes as of parent cell.

105. Read the following Assertion (A) and Reason (R) and select the **correct** option.
Assertion (A): A complex formed by pair of synapsed homologous chromosomes is called bivalent.
Reason (R): Tetrad is more clearly visible at zygotene stage as compare to pachytene stage.

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

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

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

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

106. All are required during chemiosmosis process for ATP synthesis, **except**

(1) Membrane

(2) Proton gradient

(3) NADP reductase

(4) Proton pump

107. Match **Column I** with **Column II** and select the **correct** option.

	Column I		**Column II**
(a)	Jan Ingenhousz	(i)	Experiment helps in describing the first action spectrum of photosynthesis
(b)	Julius von Sachs	(ii)	Showed that sunlight is essential for plants
(c)	T.W. Engelmann	(iii)	Found that glucose is made in green parts of plants
(d)	Ruben, Kamen et al	(iv)	Proved that O_2 evolve during light reaction comes from H_2O.

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

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

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

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

108. Identify the **incorrect** statement w.r.t. dark reaction in C_4 plants.

(1) The primary acceptor of CO_2 is PEP.

(2) The first stable product is 3-phosphoglycerate

(3) It occurs in mesophyll and bundle sheath cell.

(4) It involves Calvin cycle as the main biosynthetic pathway.

109. When glycocalyx is thick and tough, it is called

(1) Capsule

(2) Slime layer

(3) Cell wall

(4) Cell membrane

110. An elaborate network of filamentous proteinaceous structures consisting of microtubules and microfilaments is collectively referred to as the

(1) Thylakoid

(2) Flagella

(3) Cisternae

(4) Cytoskeleton

111. Select the **correct** statements regarding the nucleoplasm.
(a) It contains the nucleolus and chromatin.
(b) It is a colloidal substance within the nucleus.
(c) It is surrounded by the nuclear envelope.
(d) It is completely devoid of proteins.
The **correct** ones are

(1) Only (a) and (c)

(2) Only (b) and (d)

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

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

112. Find the **odd** one w.r.t. plasmodesmata.

(1) They are present in pit through which cytoplasm of one cell is in contact with other cell

(2) They form the dead components of cell wall

(3) They contain a fine tubule called desmotuble

(4) They form the symplastic system between two cells

113. A tetrad formed during meiosis is composed of

(1) 4 pairs of homologous chromosomes with 4 chromatids

(2) 2 pairs of homologous chromosomes with 2 chromatids

(3) A pair of homologous chromosomes with 4 chromatids

(4) 2 pairs of non-homologous chromosomes

114. Read the given Assertion (A) and Reason (R) and choose the **correct** option.
Assertion (A): The organelle responsible for lysosome formation remains in close association with endoplasmic reticulum.
Reason (R): Vesicles containing materials to be packaged release from ER and fuse with the concave face of Golgi apparatus and move towards the trans face.

(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

115. In one turn of Calvin cycle, the regeneration step requires

(1) Two molecules of ATP and one molecule of NADPH

(2) One molecule of ATP and two molecules of NADPH

(3) Only one molecule of ATP

(4) Only two molecules of NADPH

116. Immediate donor of electrons to PS–I is

(1) Phaeophytin

(2) Cyt b_6f

(3) Plastocyanin

(4) Plastoquinone

117. **Assertion (A):** The plant factors affecting photosynthesis are dependent on the genetic predisposition of the plant.
Reason (R): At any point, the rate of photosynthesis will be determined by the factor available at sub-optimal levels.
Consider the above statements and 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) (A) is true but (R) is false

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

118. The gap between meiosis I and meiosis II is **not** characterized with

(1) Centriole duplication in animal cells

(2) RNA synthesis

(3) Protein synthesis

(4) DNA replication

119.

The event which is associated with the stage represented in the above diagram is

(1) Condensation of chromatin into chromosome

(2) Formation of ER and Golgi apparatus

(3) Alignment of chromosome at the equator

(4) Splitting of centromere and separation of chromatids.

120. In an experiment a part of leaf is enclosed in a test tube containing some KOH soaked cotton, while the other half is exposed to air. The set up is then placed in light for sometime. This experiment was performed to show that

(1) Green parts of plant release oxygen

(2) CO_2 is required for photosynthesis

(3) Air is required for growth of green plants

(4) Photosynthesis is essentially a light-dependent reaction

121. Which of the following is found in all green plants?

(1) Kranz anatomy

(2) Calvin cycle

(3) Double carboxylation

(4) Scotoactive stomata

122. Oxygen evolving complex (OEC)

(1) Is associated with photosystem I

(2) Does not provide electrons to photosystem II

(3) Evolves oxygen by splitting of carbon dioxide

(4) Is located on the inner side of the membrane of the thylakoid

123. Which of the following statement is **correct** w.r.t. Z scheme.

(1) It is performed by photosystem I independently.

(2) An external source of electron is not required.

(3) It synthesises ATP and NADPH.

(4) It is not connected with photolysis of water.

124. Match **Column I** with **Column II** and select the **correct** option.

	Column I		**Column II**
(a)	Rough endoplasmic reticulum	(i)	Hydrolytic enzymes
(b)	Smooth endoplasmic reticulum	(ii)	Glycosidation of lipids
(c)	Golgi apparatus	(iii)	Protein synthesis and secretion
(d)	Lysosomes	(iv)	Detoxification of drugs

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

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

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

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

125. Kranz anatomy is one of the characteristics of the leaves of

(1) Bell pepper

(2) Mustard

(3) Sugarcane

(4) Tomato

126. Read the following statements and select the **correct** option.
Statement (A): Photorespiration occurs usually when there is high concentration of oxygen as compare to CO_2 in atmosphere.
Statement (B): Photorespiration is initiated in mitochondria.

(1) Only statement A is correct

(2) Only statement B is correct

(3) Both statements A and B are correct

(4) Both statement A and B are incorrect

127. The complete disintegration of the nuclear envelope marks the end of

(1) Metaphase

(2) Anaphase

(3) Prophase

(4) Telophase

128. Read the statements (A–D)
(A) Light duration does not affect the rate of photosynthesis, but it affects the overall photosynthesis.
(B) Tropical plants have a lower temperature optimum than the plants adapted to temperate climates.
(C) CO_2 is a major limiting factor influencing the rate of photosynthesis.
(D) Photosynthetic process utilizes less than 1% of the water absorbed by a plant.
In the light of above statements select the **correct** ones.

(1) Only (A) and (B)

(2) Only (A), (B) and (D)

(3) Only (A), (C) and (D)

(4) Only (C) and (D)

129. Read the following statements and choose the **correct** option.
Assertion (A): Mitochondria can synthesise some of its own proteins.
Reason (R): Both inner and outer membrane of the mitochondria have enzymes.

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

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

130. In animal cells, during the S phase, which of following events occur?

(1) DNA replication begins in cytoplasm

(2) Centriole duplicates in cytoplasm

(3) Centriole duplicates in nucleus

(4) Mitochondria duplicates in cytoplasm

131. Dyad of cells produced in reductional division

(1) Are formed just after diakinesis

(2) Have haploid nuclei

(3) Have bivalent chromosomes

(4) Undergo crossing over

132. Which of the following does **not** occur during cytokinesis of plant cells?

(1) Furrow formation

(2) Phragmoplast formation

(3) Cell wall formation

(4) Centrifugal growth of cell plate

133. The last stage of meiosis II is characterised by

(1) Formation of cell walls around the nuclei

(2) Separation and movement of chromosomes

(3) Disintegration of centrosomes

(4) Enclosing of two groups of chromosomes by separate nuclear envelopes

134. "The productivity and yields are better in C_4 plants as compared to C_3 plants". This is due to

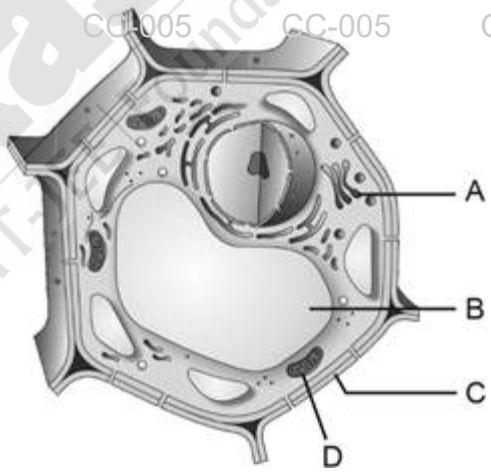
(1) Presence of thin cuticle in C_4 plants

(2) Higher surface area of leaves in C_4 plant

(3) Higher water use by C_4 plant

(4) Presence of a mechanism in C_4 plants that minimizes the oxygenase activity of RuBisCO and increases the carboxylase activity

135. Consider the following diagram and select the option which is **not** true regarding the labelled part.



(1) A – Performs the function of packaging material

(2) B – Contains excretory products and other materials

(3) C – Made up of cellulose

(4) D – Contains xanthophylls

ZOOLOGY

136. Select the correct set of granulocytes from the options given below.

(1) Neutrophils, Eosinophils

(2) Lymphocytes, Monocytes

(3) Basophils, Monocytes

(4) Eosinophils, Lymphocytes

137. The _____ is permeable to water but almost impermeable to electrolytes, resulting in concentration of filtrate.
Fill in the blank by selecting the **correct** option.

(1) Descending limb of loop of Henle

(2) Ascending limb of loop of Henle

(3) Distal convoluted tubule

(4) Proximal convoluted tubule

138. Consider the statements given below
Statement A: All the reptiles have a 3-chambered heart with two atria and a single ventricle.
Statement B: In humans, the opening between the right atrium and the right ventricle is guarded by valve made up of three muscular cusps whereas the opening between the left atrium and the left ventricle is guarded by valve made up of two muscular cusps.
Choose the **correct** option.

(1) Both the statements A and B are correct

(2) Both the statements A and B are incorrect

(3) Only statement A is incorrect

(4) Only statement B is incorrect

139. Select the correct match.

(1) *Petromyzon*- Incomplete double circulation

(2) *Scoliodon*- Single circulation

(3) *Clarias*- Complete double circulation

(4) *Balaenoptera*- Single circulation

140. Consider the given features w.r.t human circulatory system.
(a) Possesses the thickest muscular wall
(b) Walls are innervated by Purkinje fibres
(c) Pumps oxygenated blood
The above mentioned features are true for the chamber of heart which

(1) Has SA node in its wall

(2) Receives blood directly from pulmonary artery

(3) Pumps blood to lungs *via* pulmonary vein

(4) Pumps blood to the Aorta with maximum blood pressure

141. **'A'** and **'B'** represents the structures found in renal medulla and renal cortex of the kidney respectively. Identify A and B and choose the correct option.

	A	**B**
(1)	Bowman's capsule	Vasa recta
(2)	Loop of Henle	DCT
(3)	PCT	Collecting duct
(4)	DCT	Malpighian corpuscle

(1) (1)

(2) (2)

(3) (3)

(4) (4)

142. In a hypothetical condition, if only AV node is removed from the human heart in such a way that the action potentials generated in SA node are still conducted to the ventricles by AV bundle and Purkinje fibres. Then, what could be the possible effects in such case?

(1) Atria will stop contracting

(2) Stroke volume will increase

(3) Both atria and ventricles will stop contracting

(4) Both atria and ventricles will contract nearly at the same time

143. In case of a standard electrocardiogram, the heart rate of a healthy individual can be determined by counting the number of _____, representing ventricular depolarisation, that occur in a given time period. Select the option that correctly fills the blank.

(1) P-waves

(2) T-waves

(3) QRS complexes

(4) PQ intervals

144. Some organisms are given below with their respective excretory structures and types of circulatory system.

	Animal	**Excretory structure**	**Type of circulatory system**
(1)	*Periplaneta*	Malpighian tubules	Open
(2)	*Amphioxus*	Flame cells	Closed
(3)	*Palaemon*	Green glands	Open
(4)	*Pheretima*	Antennal glands	Closed

Choose the option with the incorrect match.

(1) (1)

(2) (2)

(3) (3)

(4) (4)

145. In adult humans, erythrocytes are formed in

(1) Thymus

(2) Bone marrow

(3) Spleen

(4) Heart

146. In humans, the second heart sound named 'dub' is produced due to

(1) Closure of AV valves

(2) Opening of AV valves

(3) Closure of semilunar valves

(4) Opening of semilunar valves

147. Consider the given statements w.r.t. a healthy adult human:
(a) Kidneys can produce urine nearly four times concentrated than the initial filtrate formed.
(b) Ultra-filtration is a non-selective process where blood is filtered so finely through the filtration membrane that all the constituents of the plasma except the proteins pass onto the lumen of Bowman's capsule.
(c) Many collecting ducts converge and open into the renal pelvis through the medullary pyramids in the calyces.
(d) PCT is the main site of reabsorption and selective secretion.
How many of the above statements is/are correct?

(1) One

(2) Two

(3) Three

(4) Four

148. Which of the following sets of compounds are reabsorbed by utilising energy against their concentration gradient in tubular epithelial cells?

(1) Urea and amino acids

(2) Ammonia and glucose

(3) Ammonia and amino acids

(4) Amino acids and glucose

149. In case of a healthy adult human, the average amount of urea excreted out per day is almost equal to

(1) 10-12 gm

(2) 50-60 gm

(3) 25-30 gm

(4) 5-8 gm

150. Match column I with column II w.r.t values of given parameters per minute in a healthy man.

	Column I		**Column II**
(a)	Amount of CO_2 removed by lungs	(i)	5040 mL
(b)	Amount of blood filtered by kidneys	(ii)	125 mL
(c)	Glomerular filtration rate	(iii)	1100-1200 mL
(d)	Blood pumped out by each ventricle of the heart	(iv)	200 mL

Select the **correct** option.

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

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

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

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

151. Human heart is protected by a double walled membranous bag, enclosing which of the following fluids?

(1) Medullary interstitial fluid

(2) Pleural fluid

(3) Alveolar fluid

(4) Pericardial fluid

152. **Assertion (A)**- Juxtamedullary nephron and vasa recta are mainly responsible for the production of concentrated urine in humans.
Reason (R)- The proximity between the loop of Henle of juxtamedullary nephron and vasa recta as well as the counter current in them maintain the increasing osmolarity towards the inner medullary interstitium and helps in an easy passage of water from the collecting tubule.
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 but (R) is false

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

153. Internal structure of human kidneys reveal the presence of pyramid shaped structures. These renal pyramids are parts of

(1) Renal cortex projecting into renal medulla

(2) Renal medulla leading into the calyces

(3) Renal medulla directly projecting into renal pelvis

(4) Renal cortex projecting into medullary calyces

154. The middle layer in the walls of blood vessels which is comparatively thicker in arteries than that in veins, is made of

(1) Squamous endothelium

(2) Fibrous connective tissue with collagen fibres

(3) Smooth muscle and elastic fibres

(4) Fibrous connective tissue and squamous endothelium

155. All of the following are true for lymph, **except**

(1) It contains lymphocytes which are responsible for immune response of the body

(2) It is a carrier for nutrients and hormones

(3) Fat absorption in lacteals takes place through it

(4) Its primary role is transport of respiratory gases through respiratory pigment

156. In humans, under normal physiological conditions, cardiac output can be expressed as:

(1) Stroke volume + End systolic volume

(2) Stroke volume – End systolic volume

(3) Stroke volume × Heart rate

(4) Stroke volume × 2 (Heart rate)

157. Which of the given blood cells are phagocytic in function?

(1) Erythrocytes and neutrophils

(2) Basophils and neutrophils

(3) Neutrophils and monocytes

(4) Eosinophils and neutrophils

158. Which of the following is **mismatched** under normal physiological conditions in a healthy adult man?

(1) Duration of a complete cardiac cycle – 0.8 seconds

(2) Amount of urine formed per day – 1 – 1.5 L

(3) Stroke volume – About 70 ml

(4) Heart beat rate – About 150 times/min

159. The pulmonary circulation starts by the pumping of $\frac{A}{B}$ blood by the right ventricle which is carried to the $\frac{A}{B}$.

Choose the **correct** option that fills the blanks A and B respectively.

(1) Oxygenated; Heart

(2) Oxygenated; Lungs

(3) Deoxygenated; Lungs

(4) Deoxygenated; Heart

160. In per mm^3 of human blood, the formed elements with maximum number and minimum number respectively would be

(1) WBCs, RBCs

(2) RBCs, WBCs

(3) RBCs, Platelets

(4) Platelets, WBCs

161. In order for blood to flow from right atrium to left atrium in mammalian heart, it must flow through

(1) Right ventricle → Pulmonary vein → Lungs → Pulmonary artery

(2) Right ventricle → Pulmonary artery → Lungs → Pulmonary vein

(3) Right ventricle → Pulmonary trunk → Lungs → Aorta

(4) Right ventricle → Aorta → Lungs → Pulmonary trunk

162. **Assertion (A) :** The cardiac output of an athlete during exercise will be much higher than that of an ordinary man.
Reason (R) : Cardiac output is based on the body's ability to alter the heart rate but not stroke volume.
In the light of above statements, choose the **correct** option.

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

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

(3) Assertion is true but Reason is false

(4) Both Assertion and Reason are false

163. "Human heart is myogenic". Which of the following statements supports the above mentioned fact?

(1) Neural signals through ANS can increase or decrease the rate of heart beat.

(2) The cardiac output can be increased through adrenal medullary hormones.

(3) Specialised nodal musculature present in heart has the ability to generate action potentials without any external stimuli.

(4) Neural centres in medulla oblongata can moderate the cardiac functions through ANS.

164. Select the **incorrectly** matched option among the following w.r.t. disorders of the excretory system.

(1) Renal calculi – Stone or insoluble mass of crystallised salts formed within the kidney

(2) Glomerulonephritis – Inflammation of glomeruli of kidney

(3) Glycosuria – Presence of glucose in blood

(4) Ketonuria – Presence of ketone bodies in urine

(1) (1)

(2) (2)

(3) (3)

(4) (4)

165. Reabsorption and secretion of substances occur in different parts of nephron, but selective secretion of H^+ takes place in
a. PCT
b. DCT
c. Collecting duct
d. Bowman's capsule
Select the **correct** option.

(1) a, b and c

(2) a and c only

(3) a and d only

(4) a, b, c and d

166. Na^+ is least likely to be reabsorbed from which of the following parts of nephron?

(1) PCT

(2) DCT

(3) Ascending limb of loop of Henle

(4) Descending limb of loop of Henle

167. Choose the **incorrect** statement regarding antidiuretic hormone.

(1) Facilitates water reabsorption from the latter parts of renal tubule, thereby preventing diuresis.

(2) Increases permeability of DCT and collecting duct to water.

(3) Deficiency may lead to increase in urinary output.

(4) Works antagonistic to Angiotensin II w.r.t. blood pressure.

168. The process of secretion of metabolic wastes by tubular cells into filtrate is known as

(1) Tubular reabsorption

(2) Micturition

(3) Tubular secretion

(4) Filtration

169. The dialysing fluid in haemodialysing unit has nearly the same composition as that of blood plasma but lacks

(1) Glucose

(2) Amino acids

(3) Fats

(4) Nitrogenous waste products

170. At the beginning of ventricular systole, rise in ventricular pressure causes the AV valves to close. Further rise in ventricular pressure eventually leads to

(1) Opening of AV valves

(2) Atrial depolarisation

(3) Opening of semilunar valves

(4) Rapid filling of left atrium

171. Read the following statements w.r.t. a normal adult human kidney.
a. These are bean shaped structures, located close to the dorsal inner wall of the abdominal cavity.
b. They are situated between the levels of last thoracic and third lumbar vertebra.
c. Each kidney measures 10-12 cm in length and 5-7 cm in thickness.
d. Ureter, blood vessels and nerves leave the kidney through minor calyx.
Choose the option with only the **correct** statements.

(1) a and b

(2) b and c

(3) b, c and d

(4) a, b, c and d

172. Match column I with column II and select the **correct** option w.r.t. the disorders of the human circulatory system.

	Column I		**Column II**
a.	Heart failure	(i)	Heart stops beating
b.	Heart attack	(ii)	Acute chest pain
c.	Cardiac arrest	(iii)	Heart is not pumping blood effectively enough to meet the needs of the body
d.	Angina	(iv)	Heart muscle is suddenly damaged by an inadequate blood supply

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

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

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

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

173. How many of the following features can be related to basophils?

Roughly 'S'-shaped nucleus, most abundant blood cells, serotonin secreting cells, involved in inflammatory reactions

Choose the **correct** option.

(1) One

(2) Two

(3) Three

(4) Four

174. Animals with different types of heart and blood circulatory pathways are given in table below. Which of the following is **incorrectly** matched?

	Animal	Type of heart	Type of circulation
(1)	*Rohu*	2-chambered	Single circulation
(2)	Frog	3-chambered	Incomplete double circulation
(3)	Lizard	3-chambered	Incomplete single circulation
(4)	Human	4-chambered	Double circulation

(1) (1)

(2) (2)

(3) (3)

(4) (4)

175. Select the correct set of animals which are uricotelic in nature.

(1) Bony fishes and aquatic amphibians

(2) Terrestrial amphibians and land reptiles

(3) Land snails and birds

(4) Bony fishes and reptiles

176. The atria of heart releases ANF which can cause __A__ of blood vessels and thereby __B__ in blood pressure.
Select the correct option to fill in the blanks A and B respectively.

	A	B
(1)	Constriction	Decrease
(2)	Constriction	Increase
(3)	Dilation	Decrease
(4)	Dilation	Increase

(1) (1)

(2) (2)

(3) (3)

(4) (4)

177. Dehydration increases the plasma concentration of all the following hormones, **except**

(1) Aldosterone

(2) Vasopressin

(3) Angiotensin II

(4) Atrial natriuretic factor

178. In ureotelic animals such as humans

(1) Urea is completely excreted out from kidney matrix

(2) Urea cannot be retained in the kidney matrix

(3) Some amount of urea may be retained in the kidney matrix

(4) Urea is excreted in the form of pellet or paste with a minimum loss of water

179. 'A', 'B' and 'C' are accessory excretory organs in humans.
'A' secretes bile pigments, degraded steroid hormones, *etc*.
The primary function of 'B' is to facilitate a cooling effect on the body surface.
'C' removes significant quantities of water every day.
Choose the option that **correctly** identifies 'A', 'B' and 'C' respectively.

(1) Liver, sweat glands and lungs

(2) Kidney, skin and liver

(3) Sweat glands, skin and liver

(4) Liver, lungs and skin

180. In humans, urea is produced from ammonia through metabolic reactions within

(1) Stomach

(2) Liver

(3) Pancreas

(4) Kidney