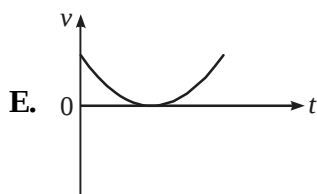
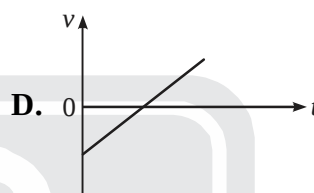
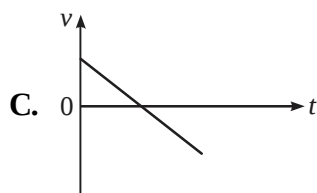
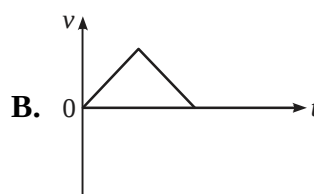
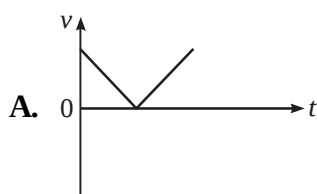




NEET (UG) - 2026

PHYSICS

1. In the following plots show variation of velocity (v) with time (t), of a ball thrown vertically upward, and falling back. Which of the following plots is/are correct ?



- (a) B only (b) A and E only (c) D only (d) C only

Correct option is (d)

2. For a metal of work function 6.6 eV, which of the following wavelengths of incident radiation does **not** give rise to the photoelectric effect ?

- (a) 50 nm (b) 100 nm (c) 150 nm (d) 200 nm

Correct option is (d)

3. The power of a crane, which lifts a mass of 1000 kg to a height of 20 m in 10 s is :

- (a) 39.2 kW (b) 39.2 W (c) 19.6 kW (d) 19.6 W

Correct option is (c)

4. Match List-I with List-II :

List-I

- A. $E = hv$
 B. Diffraction and Interference
 C. $\lambda = h/p$
 D. Compton effect

List-II

1. De-Broglie wavelength
 2. Particle nature of light
 3. Wave nature of light
 4. Energy of photon

Choose the **correct** answer from the options given below:



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

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

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

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

Correct option is (d)

5. The magnitude and direction of the acceleration produced in a body of mass 5 kg when two mutually perpendicular forces 8 N and 6 N act on it, are respectively :

(a) 2 m s^{-2} ; $\tan^{-1}(4/3)$ with 8 N force

(b) 2 m s^{-2} ; $\tan^{-1}(3/4)$ with 8 N force

(c) 2 m s^{-2} ; $\tan^{-1}(3/4)$ with 6 N force

(d) 20 m s^{-2} ; $\tan^{-1}(4/3)$ with 8 N force

Correct option is (b)

6. The sum of kinetic energy and potential energy of a simple pendulum bob is 0.02 joule. The speed of the simple pendulum bob at equilibrium position is approximately : [Consider mass of the bob = 20 g]

(a) 14.1 m/s

(b) 1.41 m/s

(c) 2.0 m/s

(d) 0.2 m/s

Correct option is (b)

7. A box of mass 15 kg is kept on the floor of a stationary trolley. The coefficient of static friction between the box and the trolley is 0.12. Keeping the box in stationary state over the trolley, the maximum acceleration with which the trolley can be moved horizontally, in m s^{-2} is:

(a) 1.2

(b) 1.8

(c) 1.5

(d) 2.1

Correct option is (a)

8. The speed of light in vacuum is taken as unity. If light takes 6 min 40 s to reach the Earth from the Sun, the distance between the Sun and the Earth in new unit is:

(a) 500

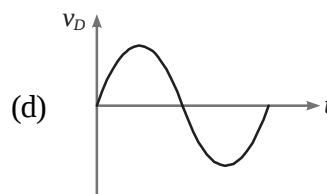
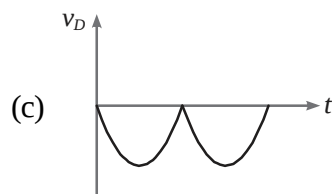
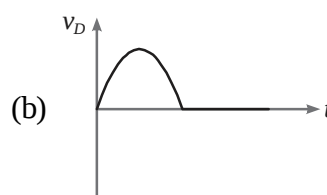
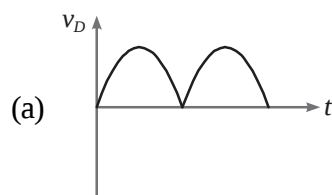
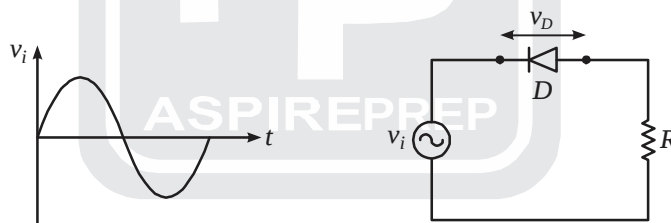
(b) 3×10^8

(c) 400

(d) 3×10^{10}

Correct option is (c)

9. In the circuit shown below, the voltage appearing across the diode D will be of the form :



Correct option is (b)

10. A submarine is designed to withstand an absolute pressure of 100 atm. How deep can it go below the water surface ?

[Consider the density of water = 1000 kg m^{-3} , 1 atm = $1 \times 10^5 \text{ Pa}$ and gravitational acceleration $g = 10 \text{ m/s}^2$]

(a) 990 m

(b) 9000 m

(c) 99 m

(d) 9900 m

Correct option is (a)

11. An electric heater supplies heat to a system at a rate of 100 W. If the system performs work at a rate of 75 J/s, then the rate at which internal energy increases will be:

(a) 125 W (b) 75 W (c) 100 W (d) 25 W

Correct option is (d)

12. A 100 turn closely wound circular coil of radius 5 cm has a magnetic field of 3.14×10^{-3} T at its centre. The current flowing through the coil, and the magnitude of the magnetic moment of this coil are, respectively:

[Take : $\mu_0 = 4\pi \times 10^{-7}$ T m/A]

(a) 2 A, 4 A m² (b) 2.5 A, 20 A m² (c) 2.5 A, 2 A m² (d) 2 A, 10 A m²

Correct option is (c)

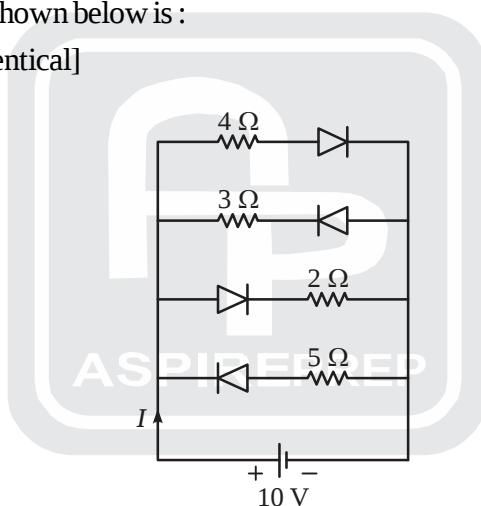
13. In Young's double slit experiment, using monochromatic light of wavelength λ , the intensity of light at a point on the screen where the path difference is λ , is K units. The intensity of light at a point where the path difference is $\lambda/3$ will be :

(a) K/2 (b) 2 K (c) K/4 (d) K

Correct option is (c)

14. The current I in the circuit shown below is :

[All diodes are ideal and identical]



(a) $\frac{5}{3}$ A (b) $\frac{5}{9}$ A (c) $\frac{15}{2}$ A (d) $\frac{1}{3}$ A

Correct option is (c)

15. In a concave lens, a ray of light emanating from the object parallel to the principal axis of the lens, after refraction :

(a) passes through the second principal focus.
 (b) appears to diverge from the first principal focus.
 (c) emerges parallel to the principal axis.
 (d) passes through 2F, which is the radius of curvature of the lens.

Correct option is (b*)

16. A galvanometer of resistance $100\ \Omega$ gives full scale deflection for a current of 1 mA . It is converted into an ammeter of range $0 - 10\text{ A}$. The shunt required is :
- (a) $0.10\ \Omega$ (b) $0.001\ \Omega$ (c) $1.0\ \Omega$ (d) $0.01\ \Omega$

Correct option is (d)

17. In the first excited state of hydrogen atom, the energy of its electron is -3.4 eV . The radial distance of the electron from the hydrogen nucleus in this case is approximately:

$$\left[\text{Take: } 1\text{ eV} = 1.6 \times 10^{-19}\text{ J}, e = 1.6 \times 10^{-19}\text{ C and } \frac{1}{4\pi\epsilon_0} = 9 \times 10^9\text{ N m}^2/\text{C}^2 \right]$$

- (a) $2.1 \times 10^{-11}\text{ m}$ (b) $2.1 \times 10^{-10}\text{ m}$ (c) $2.1 \times 10^{-9}\text{ m}$ (d) $2.1 \times 10^{-8}\text{ m}$

Correct option is (b)

18. The amount of work done to raise a mass m from the surface of the Earth to a height equal to the radius of the Earth R , will be :

- (a) mgR (b) $2mgR$ (c) $mg\frac{R}{4}$ (d) $mg\frac{R}{2}$

Correct option is (d)

19. An ac circuit contains a resistance of $1\text{ k}\Omega$, a capacitor of $0.1\ \mu\text{F}$ and an inductor of 1 mH connected in series. The resonance frequency of the circuit is approximately:

- (a) 13.5 kHz (b) 15.9 kHz (c) 10.1 kHz (d) 20.7 kHz

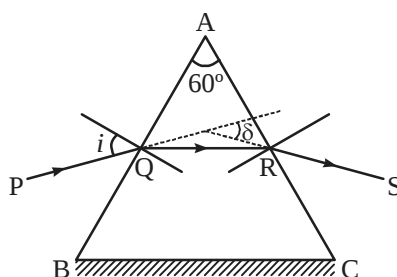
Correct option is (b)

20. Consider two uncharged capacitors of equal capacitance 200 pF . One of them is charged by a 100 V supply and disconnected. Now this capacitor is connected to the uncharged capacitor. The amount of electrostatic energy lost in the process is :

- (a) 1.0 J (b) 0.5 J (c) $1.0 \times 10^{-6}\text{ J}$ (d) $0.5 \times 10^{-6}\text{ J}$

Correct option is (d)

21. A ray of monochromatic light is passing through an equilateral prism (ABC) as shown in the figure.

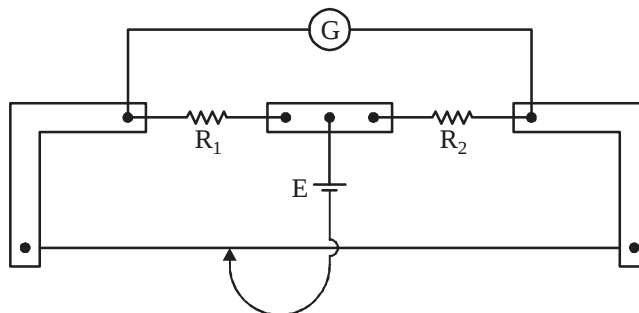


The refracted ray (QR) is parallel to its base (BC) and the angle of incidence (i) is 50° . Then the angle of deviation (δ) is :

- (a) 45° (b) 40° (c) 35° (d) 55°

Correct option is (b)

22. In a metre bridge experiment (see figure), the positions of the cell, E, and galvanometer, G, are interchanged. We shall observe in the galvanometer :



- (a) Only the left-sided deflection.
 (b) Both right-sided and left-sided deflection and at balance point, no deflection.
 (c) Only the right-sided deflection.
 (d) There will be no deflection irrespective of the position of the jockey.

Correct option is (b)

23. A flask contains Argon and Chlorine in the ratio of 2 : 1 by mass. The temperature of the mixture is 27 °C. The ratio of root mean square speed of the molecules of the two gases ($v_{\text{r.m.s.}}^{\text{Ar}} / v_{\text{r.m.s.}}^{\text{Cl}}$) is:

[Atomic mass of argon = 40.0 u and molecular mass of chlorine = 70.0 u]

- (a) $\frac{7}{4}$ (b) $\frac{\sqrt{7}}{2}$ (c) $\frac{2}{\sqrt{7}}$ (d) $\frac{7}{2}$

Correct option is (b)

24. Two statements are given below:

- A.** When the forward bias voltage across a p-n junction diode increases above a certain threshold voltage, the diode current increases significantly.
B. This current is called reverse saturation current.

Choose the **correct** answer from the options given below :

- (a) Statement A is true, but Statement B is false.
 (b) Both Statements A and B are true.
 (c) Both Statements A and B are false.
 (d) Statement A is false, but Statement B is true.

Correct option is (a)

25. For a travelling harmonic wave:

$$y(x, t) = 2.0 \cos 2\pi (10t - 0.0080x + 0.35),$$

where x and y are in cm and t in s. The phase difference between oscillatory motion of two points separated by a distance of 0.5 m is :

- (a) 0.8π rad (b) 8π rad (c) 0.008π rad (d) 0.08π rad

Correct option is (a)

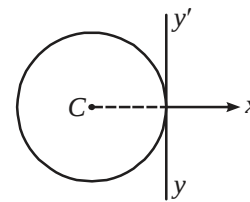
26. A rectangular wire loop of sides 8 cm and 3 cm with a small cut, is moving out of a region of uniform magnetic field of magnitude 0.3 T directed normal to the plane of the loop. The e.m.f. developed across the cut, if the velocity of the loop is 2 cm s⁻¹, in a direction normal to the shorter side of the loop, will be :

- (a) 4.8×10^{-4} volt (b) 1.3×10^{-4} volt (c) 1.2×10^{-4} volt (d) 1.8×10^{-4} volt

Correct option is (d)

27. A thin wire of length ' L ' and linear mass density ' m ' is bent into a circular ring (in x - y plane) with centre ' C ' as shown in figure. The moment of inertia of the ring about an axis yy' will be :

- (a) $\frac{3mL^2}{8\pi}$ (b) $\frac{3mL^2}{8\pi^2}$
 (c) $\frac{3mL^3}{8\pi}$ (d) $\frac{3mL^3}{8\pi^2}$



Correct option is (d)

28. A resistor is connected to a battery of 12 V e.m.f. and internal resistance $2\ \Omega$. If the current in the circuit is 0.6A, the terminal voltage of the battery is :

- (a) 10.8 V (b) 1.2 V (c) 12 V (d) 10 V

Correct option is (a)

29. When a ruler falls vertically, 5 different persons catch it with different reactions times. $[g = 9.8\ \text{m s}^{-2}]$

- A. Person A has reaction time of 0.20 s.
 B. Person B has reaction time of 0.22 s.
 C. Person C has reaction time of 0.18 s.
 D. Person D has reaction time of 0.19 s.
 E. Person E has reaction time of 0.21 s.

What is the **correct** order of the distance travelled by the ruler for each person ?

- (a) $C > D > A > E > B$ (b) $C > D > A > B > E$
 (c) $B > E > A > D > C$ (d) $B > E > A > C > D$

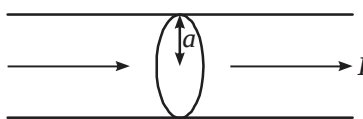
Correct option is (c)

30. The angular speed of a flywheel is increased from 600 rpm to 1200 rpm in 10 s. The number of revolutions completed by the flywheel during this time is :

- (a) 300 (b) 150 (c) 900 (d) 600

Correct option is (b)

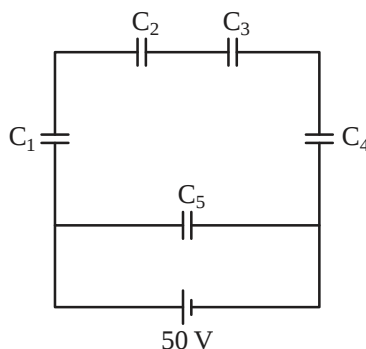
31. The figure given below shows a long straight solid wire of circular cross-section of radius ' a ' carrying steady current I . The current I is uniformly distributed across its cross-section. The plot which correctly represents the variation of magnetic field (B) with distance (r) from the axis of the conductor in the region is :



- (a) (b)
 (c) (d)

Correct option is (d)

32. Four statements are given (A is mass number):
- A. The volume of a nucleus is proportional to $A^{1/3}$.
 - B. The volume of a nucleus is proportional to A.
 - C. The difference in mass of an atom and its nucleus is called the mass defect.
 - D. The difference in mass of a nucleus and its constituents is called the mass defect.
- Choose the **correct** answer from the options given below:
- (a) A and D are true, but B and C are false
 - (b) B and D are true, but A and C are false
 - (c) B and C are true, but A and D are false
 - (d) A and C are true, but B and D are false
- Correct option is (b)**
33. Savitha, a XI standard student, while conducting an experiment to determine the effective length of a simple pendulum L, notes down the data of time taken to complete 30 oscillations as 60 s and hence calculates the length of the simple pendulum as :
- [Take : $\pi^2 = 9.8$, and $g = 9.8 \text{ m/s}^2$]
- (a) 2 m
 - (b) 1 m
 - (c) 0.75 m
 - (d) 1.5 m
- Correct option is (b)**
34. In a vernier calliper, 20 VSD coincide with 16 MSD (each division of length 1 mm). The least count of the vernier callipers is:
- (a) 0.1 cm
 - (b) 0.02 cm
 - (c) 0.01 cm
 - (d) 0.2 cm
- Correct option is (b)**
35. Each side of a metallic cube of mass 5.580 kg is measured to the 9.0 cm. Keeping the significant figures in view, the density of the material of the cube can be best expressed as $X \times 10^3 \text{ kg m}^{-3}$ where the value of X is :
- (a) 7.654
 - (b) 7.6
 - (c) 7.65
 - (d) 7.7
- Correct option is (d)**
36. In interference and diffraction, the light energy is redistributed. If it reduces in one region, producing a dark fringe, it increases in another region, producing a bright fringe.
- A. As there is no gain or loss of energy, these phenomena are consistent with the principle of conservation of energy.
 - B. Diffraction and interference are characteristics exhibited only by light waves.
- Choose the **correct** answer from the options given below:
- (a) A is false, but B is true
 - (b) A is true and B is also true
 - (c) A is true, but B is false
 - (d) Both A and B are false
- Correct option is (c)**
37. Five capacitors of capacitances: $C_1 = C_2 = C_3 = C_4 = 10 \mu\text{F}$ and $C_5 = 2.5 \mu\text{F}$ are connected as shown, along with a battery of 50 V.

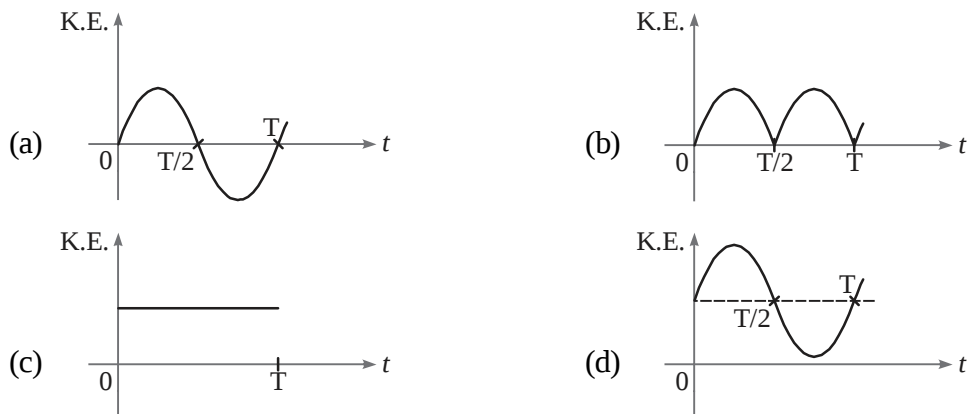


The equivalent capacitance and the charges on each capacitor respectively are:

- (a) $5 \mu\text{F}$, $125 \mu\text{C}$ on C_1 to C_4 and $25 \mu\text{C}$ on C_5
- (b) $4 \mu\text{F}$, $250 \mu\text{C}$ on C_1 to C_4 and $125 \mu\text{C}$ on C_5
- (c) $5 \mu\text{F}$, $250 \mu\text{C}$ on all capacitors
- (d) $5 \mu\text{F}$, $125 \mu\text{C}$ on all capacitors

Correct option is (d)

38. For a simple pendulum, having time period T , the variation of kinetic energy (K.E.) with time (t) is represented by:



Correct option is (b)

39. A room heater is rated 400 W , 220 V . If the supply voltage drops to 200 V , what will be the power consumed (approximately)?

- (a) 121 W
- (b) 200 W
- (c) 400 W
- (d) 331 W

Correct option is (d)

40. The peak value of an alternating current is 5 A and frequency is 60 Hz . How long will the current, starting from zero, take to reach the peak value?

- (a) $\frac{1}{60} \text{ s}$
- (b) $\frac{1}{240} \text{ s}$
- (c) $\frac{1}{30} \text{ s}$
- (d) $\frac{1}{120} \text{ s}$

Correct option is (b)

41. Which of the following statements are correct?

- A.** Inside a conductor, the electrostatic field is zero.
- B.** Electric field at the surface of a charged conductor does not depend on its surface charge density.
- C.** The interior of a charged conductor can have no excess charge in the static situation.
- D.** At the surface of a charged conductor, the electrostatic field must be normal to the surface at every point.
- E.** The electrostatic potential is zero everywhere inside a charged conductor.

Choose the **correct** answer from the options given below:

- (a) A, C and D only
- (b) A, C and E only
- (c) C, D and E only
- (d) A, B and D only

Correct option is (a)

42. Match List I with List II:

List-I (Electromagnetic wave)

- A. Microwave
- B. Visible light
- C. Gamma rays
- D. Infra-red rays

List-II (Production)

- 1. Electrons in atoms emit light when they move from a higher energy level to a lower energy level
- 2. Radioactive decay of nucleus
- 3. Vibration of atoms and molecules
- 4. Klystron valve or magnetron valve

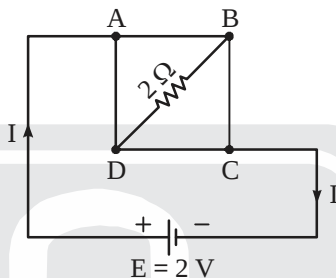
Choose the **correct** answer from the options given below:

- (a) A-3, B-1, C-2, D-4
- (c) A-4, B-1, C-2, D-3

- (b) A-3, B-4, C-1, D-2
- (d) A-4, B-3, C-2, D-1

Correct option is (c)

43. A uniform metallic wire having resistance $4\ \Omega$ is bent to form a square loop (ABCD) (see figure). A resistance of $2\ \Omega$ is connected between points B and D and a battery of 2 V is connected across points A and C as shown in the figure. Now the value of current (I) is :



- (a) 4 A
- (b) 8 A
- (c) 4.5 A
- (d) 2 A

Correct option is (d)

44. An unknown nucleus has a nuclear density of $2.29 \times 10^{17}\text{ kg/m}^3$ and mass of $19.926 \times 10^{-27}\text{ kg}$. Its mass number A is approximately:

[Take: $R_0 = 1.2 \times 10^{-15}\text{ m}$, $4\pi = 12.56$]

- (a) 12
- (b) 16
- (c) 19
- (d) 20

Correct option is (a)

45. Match List I with List II:

List-I

- A. Young's Modulus
- B. Compressibility
- C. Bulk Modulus
- D. Poisson's Ratio

List-II

- 1. $\left(\frac{\Delta d}{\Delta L}\right)\left(\frac{L}{d}\right)$
- 2. $\frac{FL}{A(\Delta L)}$
- 3. $-\frac{1}{\Delta P}\left(\frac{\Delta V}{V}\right)$
- 4. $-P\left(\frac{V}{\Delta V}\right)$

Choose the **correct** answer from the options given below:

- (a) A-2, B-3, C-4, D-1
- (c) A-1, B-4, C-3, D-2

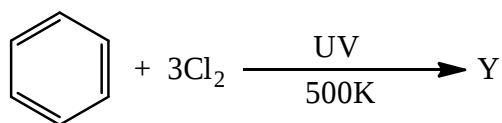
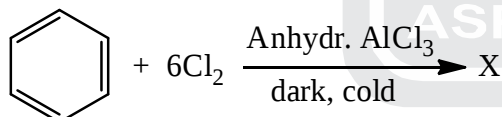
- (b) A-3, B-2, C-1, D-4
- (d) A-4, B-1, C-2, D-3



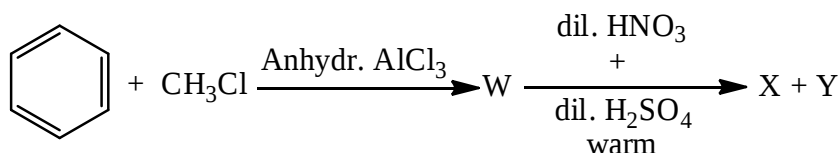
Correct option is (a)

CHEMISTRY

46. The **correct** statement with regard to the secondary structure of DNA/RNA is:
- DNA possesses a single strand helix structure and contains uracil as one of the four bases.
 - DNA possesses a double strand helix structure and contains thymine as one of the four bases.
 - RNA possesses a double strand helix structure and contains uracil as one of the four bases.
 - RNA possesses a single strand helix structure and contains thymine as one of the four bases.
47. Match **List-I** with **List-II**:
- | List-I
(Quantum Numbers) | List-II
(Orbital) |
|------------------------------------|-----------------------------|
| 'n' 'l' | |
| A. 2 1 | I. 3d |
| B. 4 0 | II. 2p |
| C. 5 3 | III. 4s |
| D. 3 2 | IV. 5f |
- Choose the **correct** answer from the options given below:
- A-II, B-III, C-I, D-IV
 - A-II, B-III, C-IV, D-I
 - A-IV, B-II, C-III, D-I
 - A-I, B-II, C-III, D-IV
48. During Lassaigne's test, the elements present in an organic compound are converted from:
- covalent form to ionic form
 - covalent form to covalent form
 - ionic form to ionic form
 - ionic form to covalent form
49. The number of chlorine atoms present in the organic products X and Y of the following reactions, respectively, are:



- (a) 3 and 6 (b) 6 and 3 (c) 3 and 3 (d) 6 and 6
50. Two products X and Y are formed in the following reaction sequence.



The suitable method that can be used for the separation of products X and Y is:

- Sublimation
- Differential extraction
- Continuous extraction
- Fractional distillation



51. Identify the **correct** statement about ClF_3 from the following options:
- It has T-shaped geometry with three lone pairs on Cl atom.
 - It has a planar trigonal geometry with two lone pairs on Cl atom.
 - It has T-shaped geometry with two lone pairs on Cl atom.
 - It has a trigonal pyramidal geometry with two lone pairs on Cl atom.
52. The functional group that can be identified through phthalein dye test is:
- Alcohol
 - Aldehyde
 - Phenolic
 - Carboxylic acid
53. A solution of copper sulphate is electrolysed for 10 minutes with a current of 1.5 amperes. The mass of copper deposited at cathode is:
- (Given: Molar mass of Cu 63 g mol^{-1} ; $1\text{F} = 96487 \text{ C mol}^{-1}$)
- 0.2938 g
 - 1.7018 g
 - 2.4036 g
 - 0.5876 g

54. Match List-I with List-II:

List-I

(Transition metal/compound/complex)

- V_2O_5
- Fe
- PdCl_2
- Ni complex

List-II

(Catalytic Role)

- Preparation of ammonia from N_2/H_2 mixture
- Polymerisation of alkynes
- Preparation of H_2SO_4 from SO_2
- Oxidation of ethyne to ethanal

Choose the **correct** answer from the options given below:

- A-III, B-I, C-IV, D-II
- A-III, B-IV, C-I, D-II
- A-IV, B-I, C-III, D-II
- A-II, B-I, C-IV, D-III

55. Match List-I with List-II:

List-I (Complex/ion)

- $[\text{Pt}(\text{Cl}_2)(\text{NH}_3)_2]$
- $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$
- $[\text{NiCl}_4]^{2-}$
- $[\text{Fe}(\text{CO})_5]$

List-II (Shape/geometry)

- Octahedral
- Trigonal bipyramidal
- Square planar
- Tetrahedral

Choose the **correct** answer from the options given below:

- A-IV, B-I, C-III, D-II
- A-III, B-I, C-IV, D-II
- A-I, B-III, C-IV, D-II
- A-III, B-IV, C-I, D-II

56. Identify the **incorrect** statement from the following:
- The IUPAC name of the element with atomic number 107 is Unnilseptium.
 - The oxidation state and covalency of Al in $[\text{AlCl}(\text{H}_2\text{O})_5]^{2+}$ are 3 and 6 respectively.
 - The largest and the smallest species among Mg, Mg^{2+} , Al and Al^{3+} are Al and Mg^{2+} , respectively.
 - The similarity in behaviour of Li with Mg is referred to as 'diagonal relationship'.
57. Given below is an expression for the rate constant of a first order reaction occurring at a certain temperature, T(K).

$$\ln k = 14.34 - \frac{1.25 \times 10^4}{T}$$

The energy of activation in kcal mol^{-1} for the reaction is: (Given: k in s^{-1} , $R = 1.987 \text{ cal mol}^{-1} \text{ K}^{-1}$)

- 14.34
- 18.63
- 24.84
- 12.42



58. Phenolphthalein is used as an indicator for the titration of sodium hydroxide solution against a standard solution of oxalic acid. The colour change that is observed at an alkaline pH close to the equivalence point during this titration is:

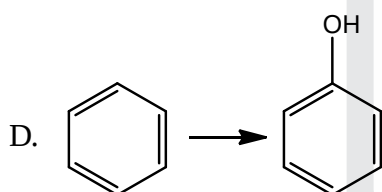
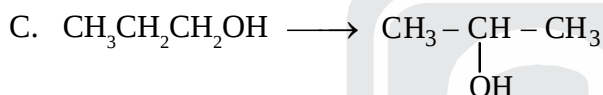
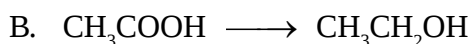
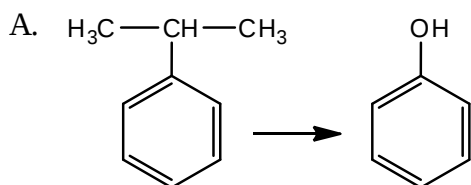
- (a) colourless to pink (b) pinkish red to yellow
(c) pink to colourless (d) yellow to pinkish red

59. Methane reacts with steam at 1273 K in the presence of nickel catalyst to form:

- (a) CO and H₂ (b) CO₂ and H₂ (c) CO and H₂O (d) CO₂ and H₂O

60. Match List-I with List-II :

List-I



List-II

- I. (i) oleum;
(ii) NaOH, Δ;
(iii) H⁺

- II. (i) O₂;
(ii) H₂O/H⁺

- III. (i) CH₃OH, H⁺;
(ii) H₂, catalyst

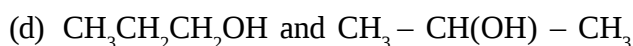
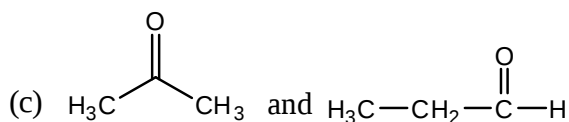
- IV. (i) conc. H₂SO₄, Δ;
(ii) H⁺/H₂O

Choose the **correct** answer from the options given below:

- (a) A-I, B-III, C-IV, D-II (b) A-II, B-III, C-I, D-IV
(c) A-II, B-III, C-IV, D-I (d) A-II, B-IV, C-III, D-I

61. The pair of molecules that are metamers among the following is:

- (a) CH₃OCH₂CH₂CH₃ and CH₃CH₂OCH₂CH₃
(b) CH₃CH₂CH₂CH₂CH₃ and (CH₃)₂CHCH₂CH₃



62. Match List I with List II:

List I (Complex)

- A. [Pt(NH₃)₂Cl₂]
B. [Co(en)₃]³⁺
C. [Co(NH₃)₅NO₂]Cl₂
D. [Cr(H₂O)₆]Cl₃

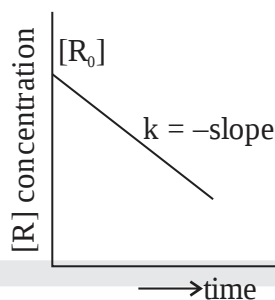
List II (Type of isomerism)

- I. Optical
II. Solvate
III. Geometrical
IV. Linkage

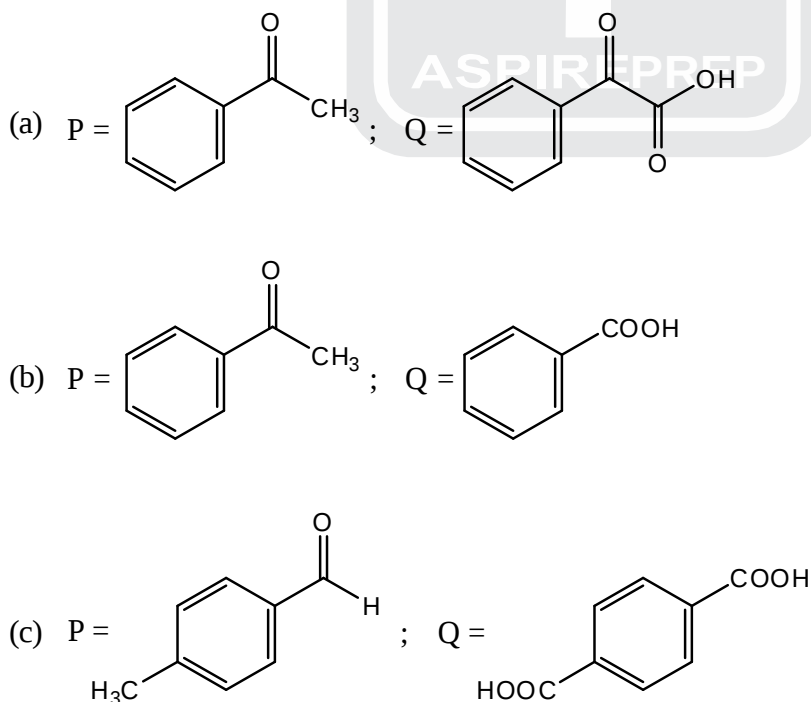


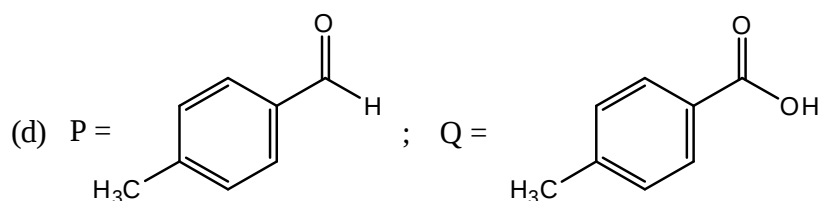
Choose the **correct** answers from the options given below:

- (a) A-II, B-IV, C-III, D-I (b) A-III, B-I, C-II, D-IV
 (c) A-I, B-III, C-II, D-IV (d) A-III, B-I, C-IV, D-II
63. The number of hydrogen atoms present in 5.4 g of urea is:
 (Given: Molar mass of urea: 60 g mol^{-1} , $N_A : 6.022 \times 10^{23} \text{ particles mol}^{-1}$)
 (a) 2.168×10^{22} (b) 2.168×10^{23}
 (c) 1.084×10^{22} (d) 1.084×10^{23}
64. The calculated 'spin-only' magnetic moment of $\text{Ti}^{2+}(3d^2)$ is:
 (a) 3.87 BM (b) 5.92 BM (c) 4.90 BM (d) 2.84 BM
65. For a certain reaction $R \rightarrow \text{Product}$, the plot of concentration $[R]$ vs time has a negative slope as shown. The order of reaction is:



- (a) 1 (b) 2 (c) 2.5 (d) 0
66. Compound P ($\text{C}_8\text{H}_8\text{O}$) gives a red orange precipitate with 2,4-DNP reagent and it does not reduce Fehling's reagent. On drastic oxidation with chromic acid, P gives an aromatic product Q that produces effervescence on treating with aq. NaHCO_3 . Compounds P and Q, respectively, are:





67. Match List I with List II :

List I**(Order of reaction)**

- A. Zero order
B. First order
C. Second order
D. Third order

List II**(Unit of rate constant)**

- I. $\text{mol}^{-1} \text{L s}^{-1}$
II. $\text{mol}^{-2} \text{L}^2 \text{s}^{-1}$
III. s^{-1}
IV. $\text{mol L}^{-1} \text{s}^{-1}$

Choose the **correct** answer from the options given below:

- (a) A-IV, B-III, C-II, D-I
(b) A-IV, B-III, C-I, D-II
(c) A-IV, B-II, C-I, D-III
(d) A-I, B-II, C-III, D-IV

68. Although +3 oxidation state is most common in lanthanoids, cerium still shows +4 oxidation state because:

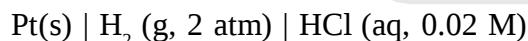
- (a) After losing one more electron, it acquires $4f^{14}$ electronic configuration.
(b) Its atomic number is 61.
(c) After losing one more electron, it acquires $4f^0$ electronic configuration.
(d) Its nearest inert gas is Radon.

69. In a test tube containing a salt, a few drops of dilute H_2SO_4 was added, which gave colourless vapours having the smell of vinegar. The vapours turned the blue litmus paper red.

Identify the **correct** anion from the following:

- (a) Carbonate, CO_3^{2-}
(b) Sulphate, SO_4^{2-}
(c) Acetate, CH_3COO^-
(d) Sulphide, S^{2-}

70. Calculate emf of the half cell given below:



$$E^\circ_{\text{H}_2/\text{H}^+} = 0\text{V}$$

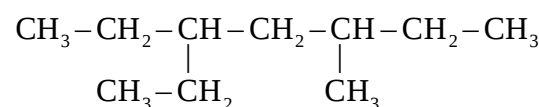
(Given : $\frac{2.303RT}{F} = 0.059, \log 2 = 0.3010$)

- (a) 0.035 V (b) -0.035 V (c) -0.109 V (d) 0.109 V

71. At 298 K, a certain buffer solution contains equal concentrations of X^- and HX , K_b for X^- is 10^{-10} . What is the pH of this buffer solution?

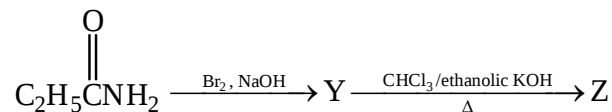
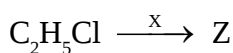
- (a) 4 (b) 6 (c) 2 (d) 10

72. The **correct** IUPAC name of the following compound is:



- (a) 3-methyl-5-ethylheptane (b) 3-ethyl-5-methylheptane
(c) 3,5-diethylhexane (d) 2,4-diethylhexane

73. The following two reactions give the same foul smelling product Z.



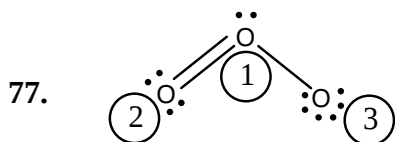
X and Z, respectively, are :

- (a) $\text{X} = \text{AgCN}$; $\text{Z} = \text{C}_2\text{H}_5\text{CN}$ (b) $\text{X} = \text{KCN}$; $\text{Z} = \text{C}_2\text{H}_5\text{CN}$
(c) $\text{X} = \text{KCN}$; $\text{Z} = \text{C}_2\text{H}_5\text{NC}$ (d) $\text{X} = \text{AgCN}$; $\text{Z} = \text{C}_2\text{H}_5\text{NC}$
74. Mixture of chloroform and acetone forms a solution with negative deviation Raoult's law due to
- (a) increase in escaping tendency of molecules of each component.
(b) repulsive forces.
(c) stronger intermolecular forces between chloroform molecules than those between chloroform and acetone molecules.
(d) formation of hydrogen bonding between acetone and chloroform.
75. Identify the correct statements:
- A. The molality of 2.5 g of ethanoic acid (Molar mass: 60 g mol^{-1}) in 75 g of benzene solution is 0.556m.
B. The molarity of a solution containing 5 g of NaOH (molar mass: 40 g mol^{-1}) in 450 mL of solution is 0.278 M at 298 K.
C. Aquatic species are more comfortable in cold water.
D. The solubility of gas increases with decrease in pressure.
E. For a binary mixture of A and B, the number of moles of A and B are n_A and n_B respectively. The mole fraction of B will be

$$x_B = \frac{n_A}{n_A + n_B}$$

Choose the **correct** answer from the options given below:

- (a) A and B only (b) A, D and E only
(c) A, B and C only (d) A and C only
76. Identify the **incorrect** statement from the following:
- (a) ECl_3 (E = B and Al) is a monomer when E = B and a dimer when E = Al
(b) The order of catenation property of Group 14 elements is $\text{C} \gg \text{Si} > \text{Ge} \approx \text{Sn}$
(c) Oxygen exhibits only -2 oxidation state.
(d) Carbon has the ability to form $p\pi$ - $p\pi$ multiple bond with itself.



The **correct** formal charges on oxygen atoms numbered 2, 1 and 3 respectively are:

- (a) -1, 0, +1 (b) 0, 0, 0 (c) 0, +1, -1 (d) +1, 0, -1

78. At a certain temperature, T (K), during a process, 500 J is absorbed by the system and work of 200 J is done by the system. Then change in internal energy of the system is:
 (a) 500 J (b) 400 J (c) 300 J (d) 700 J
79. Consider the following reaction:
 $2A(g) + B(g) \rightarrow 2D(g)$
 $\Delta U^\ominus = -10 \text{ kJ mol}^{-1}$ and $\Delta S^\ominus = -44 \text{ J K}^{-1}$ at 298 K.
 Identify the **correct** option with $\Delta G^\ominus$ for the reaction and spontaneity of the reaction at 298 K.
 (Given: $R = 8.31 \text{ J mol}^{-1} \text{ K}^{-1}$)
 (a) $-0.63568 \text{ kJ mol}^{-1}$, spontaneous (b) $+0.63568 \text{ kJ mol}^{-1}$, non-spontaneous
 (c) $-1.635 \text{ kJ mol}^{-1}$, spontaneous (d) $+1.635 \text{ kJ mol}^{-1}$, non-spontaneous
80. Select the reagents that reduce nitriles to primary amines:
 A. (i) LiAlH_4 ; (ii) H_2O B. $\text{Sn} + \text{HCl}$
 C. H_2/Ni D. $\text{Na(Hg)}/\text{C}_2\text{H}_5\text{OH}$
 E. $\text{Br}_2/\text{aq. NaOH}$
 Choose the **correct** answer from the options given below:
 (a) A, C and D only (b) A, B and C only
 (c) B, D and E only (d) A, D and E only
81. Which one of the following is an ambidentate ligand?
 (a) Oxalate (b) Ethylenediaminetetraacetate ion
 (c) Thiocyanate (d) Ethane-1,2-diamine
82. A bulb is rated at 150 watt, converting 8% energy into light. If energy of one photon is $4.42 \times 10^{-19} \text{ J}$, how many photons are emitted by the bulb per second?
 (a) 1.35×10^{19} (b) 2.71×10^{19} (c) 27.2×10^{19} (d) 4.06×10^{19}
83. Identify the **incorrect** statement from the following:
 (a) Nitrogen can form $p\pi-p\pi$ multiple bonds with itself.
 (b) $\text{P}(\text{C}_2\text{H}_5)_3$ and $\text{As}(\text{C}_6\text{H}_5)_3$ form $d\pi-d\pi$ bond with transition metals.
 (c) Nitrogen can form $d\pi-p\pi$ bond with oxygen.
 (d) Phosphorus, arsenic and antimony show catenation property.
84. The **correct** order of increasing metallic character of Na, Be, P, Mg and Si is:
 (a) $\text{P} < \text{Si} < \text{Be} < \text{Mg} < \text{Na}$ (b) $\text{Be} < \text{Si} < \text{P} < \text{Mg} < \text{Na}$
 (c) $\text{P} < \text{Si} < \text{Na} < \text{Mg} < \text{Be}$ (d) $\text{P} < \text{Mg} < \text{Be} < \text{Si} < \text{Na}$
85. In a qualitative analysis, Bi^{3+} is detected by appearance of precipitate of $\text{BiO(OH)}(\text{s})$. Calculate pH when the following equilibrium exists at 298 K:
 $\text{BiO(OH)}(\text{s}) \rightleftharpoons \text{BiO}^+(\text{aq}) + \text{OH}^-(\text{aq}), K = 4 \times 10^{-10}$
 (Given: $\log 2 = 0.3010$)
 (a) 4.699 (b) 9.301 (c) 5.286 (d) 8.714
86. Match List I with List II
- | List I | List II |
|---------------------------|------------------------------------|
| A. C_2H_4 | I. σ bonds, 2π bonds |
| B. C_2H_2 | II. 3σ bonds, one lone pair |
| C. CH_4 | III. 4σ bonds |
| D. NH_3 | IV. 5σ bonds, 1π bond |



Choose the **correct** answer from the options given below:

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

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

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

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

87. Given below are certain reactions. Identify the reaction for which $K_p \neq K_c$.

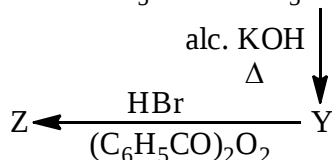
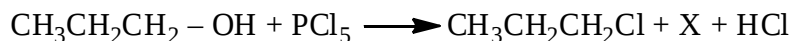
(a) $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$

(b) $H_2O(g) + CO(g) \rightleftharpoons H_2(g) + CO_2(g)$

(c) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$

(d) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

88. In the following reaction sequence, X and Z, respectively are:



(a) $X = H_3PO_3$; $Z = CH_3 - \underset{\text{Br}}{\underset{|}{CH}} - CH_3$

(b) $X = POCl_3$; $Z = CH_3 - \underset{\text{Br}}{\underset{|}{CH}} - CH_3$

(c) $X = H_3PO_3$; $Z = CH_3CH_2CH_2 - Br$

(d) $X = POCl_3$; $Z = CH_3CH_2CH_2 - Br$

89. The major product Z formed in the following sequence of reactions is:



(a) $C_2H_5NO_2$

(b) $C_2H_5 - N = N - OH$

(c) $C_2H_5NH_2$

(d) C_2H_5OH

90. When 1 dm³ of CO₂ gas is passed over hot coke, the volume of gaseous mixture after complete reaction at STP becomes 1.4 dm³. The composition of the gaseous mixture at STP is:

(a) 0.6 dm³ of CO, 0.8 dm³ of CO₂

(b) 0.6 dm³ of CO, 0.4 dm³ of CO₂

(c) 0.8 dm³ of CO, 0.8 dm³ of CO₂

(d) 0.8 dm³ of CO, 0.6 dm³ of CO₂

91. Match List I (Phase of cell cycle) with List II (Activity):

List I:

A. G₁ phase

B. S phase

C. G₂ phase,

D. M phase

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

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

List II:

I. Actual cell division

II. Cell metabolically active

III. DNA Synthesis

IV. Proteins synthesized

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

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

92. Match List I with List II:

List I:

A. Incomplete dominance

B. Co-dominance,

C. Pleiotropy

D. Polygenic inheritance

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

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

List II:

I. Human skin colour

II. Antirrhinum sp.

III. Phenylketonuria

IV. ABO blood groups

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

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



93. Which of the following statements are correct?
A. The Amazon rainforest being cut and cleared for cultivation of soyabeans is habitat loss.
B. Steller's sea cow and passenger pigeon became extinct due to over-exploitation by humans.
C. The Nile perch introduced into lake Victoria in East Africa helped in population growth of cichlid fish growth.
D. Water hyacinth is an invasive species.
E. When a species becomes extinct, the plant and animal species associated with it are not affected.
Choose the correct answer from the options given below:
(1) B, C and D only (2) A, B and D only
(3) A, B and E only (4) C, D and E only
94. Which of the following statements are correct with reference to a transcription unit?
reference to a transcription unit?
A. A transcription unit in DNA is defined primarily by three regions structural gene and terminator. promoter, structural gene and terminator.
B. The promoter is said to be located towards the 5'-end of the structural gene.
C. The promoter is a DNA sequence that provides binding site for RNA polymerase.
D. The promoter defines the template and coding strands.
E. The terminator is located towards the 3'-end of the coding strand and it defines the end of the process of transcription.
Choose the correct answer from the options given below:
(1) A, C, D and E only (2) A, B, C, D and E
(3) A, B, C and D only (4) B, C, D and E only
95. Which of the following statements are true with reference to the sex-determination in honeybees?
A. An offspring formed from the union of a sperm and an egg, develops as a female (queen or worker).
B. An unfertilized egg develops as a male by parthenogenesis.
C. A male has half the number of chromosomes than that of a female.
D. Males produce sperms by meiosis.
E. Honeybees have sex-determination system, a haplodiploid.
Choose the correct answer from the options given below:
(1) A, B, C and E only (2) B, C, D and E only
(3) A, B, C and D only (4) A, B, D and E only
96. Match List I (Process) with List II (Location):
List I:
A. Glycolysis,
B. ETS,
C. Protons accumulation,
D. Krebs' cycle
(1) A-IV, B-II, C-I, D-III
(3) A-II, B-III, C-IV, D-I
List II:
I. Inner mitochondrial membrane,
II. Matrix,
III. Cytoplasm,
IV. Intermembrane space
(2) A-I, B-IV, C-III, D-II
(4) A-III, B-I, C-IV, D-II
97. How many ATP and NADPH molecules are required to make one molecule of glucose through the Calvin pathway
(1) 18 ATP and 12 NADPH (2) 6 ATP and 12 NADPH
(3) 24 ATP and 18 NADPH (4) 12 ATP and 18 NADPH
98. Match List I with List II:
List I:
A. Genetically modified organism
B. Thermostable DNA polymerase,
C. Ti plasmid,
D. pBR322
List II:
I. *Agrobacterium, tumefaciens*
II. *Bt-cotton*,
III. *Thermus aquaticus*,
IV. *E. coli*



Choose the correct answer from the options given below

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

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

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

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

99. In which one of the following, the ovules are not enclosed by an ovary wall and remain exposed

(1) Funaria

(2) Pinus

(3) Selaginella

(4) Wolffia

100. The enzyme required for carboxylation in the

(1) Carboxypeptidase

(2) PEP carboxylase

(3) RuBP carboxylase - oxygenase

(4) Hexokinase

101. Match List I with List II:

List I:

A. Trypsin,

B. Morphine

C. Concanavalin A

D. Collagen

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

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

List II:

I. Intercellular ground substance,

II. Lectin,

III. Enzyme

IV. Alkaloid

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

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

102. Which of the following statements are correct regarding amino acids?

A. They are substituted methanes.

B. Serine is aromatic.

C. Valine is neutral.

D. Lysine is acidic.

Choose the correct answer from the options given below:

(1) C and D only

(2) A and C only

(3) B and C only

(4) A and B only

103. Which one of the following disorders is caused by the substitution of Glutamic acid (Glu) by Valine (Val) at the sixth position of the beta globin chain of the haemoglobin molecule?

(1) Thalassemia

(2) Haemophilia

(3) Sickle-cell anaemia

(4) Phenylketonuria

104. Which one of the following is the site for active ribosomal RNA synthesis ?

(1) Kinetochore

(2) Centrosome

(3) Chromatin

(4) Nucleolus

105. Which one of the following statements is not true about the universal rules of binomial nomenclature?

(1) Both the words in a biological name, when handwritten, are separately underlined or printed in italics.

(2) Biological names are generally in Latin.

(3) The specific epithet in the biological name starts with a small letter.

(4) The first word in the biological name represents the specific epithet, while the second component denotes the genus.

106. Match List I (Growth Regulator) with List II (Function):

List I:

A. 2,4-D

B. GA₃,

C. Kinetin,

D. ABA

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

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

List II:

I. Brewing industry,

II. Stimulation of stomatal closure

III. Herbicide

IV. Nutrient mobilisation

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

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

107. Match List I with List II:

List I:

A. Conjunctive tissue,

B. Casparian strips,

C. Subsidiary cells,

D. Starch sheath

List II:

I. Specialised cells in the vicinity of guard cells,

II. Endodermal cells in starch,

III. Tissue between xylem and phloem,

IV. Suberin deposition



Choose the correct answer from the options given C

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

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

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

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

108. Which one of the following types of pollination brings genetically different types of pollen grains to the stigma?
(1) Cleistogamy (2) Autogamy (3) Geitonogamy (4) Xenogamy

109. Heterophyllous development in response to environment is an example of which of the following phenomena ?
(1) Plasticity (2) Dedifferentiation
(3) Redifferentiation (4) Elasticity

110. Which of the following statements are not true regarding restriction endonucleases?
A. They are called molecular scissors.
B. These are the enzymes responsible for restricting the growth of bacteriophages in *E. coli*.
C. They cut the DNA only at the centre of the palindromic sites.
D. They remove nucleotides only from the ends of DNA fragments.
They recognise specific palindromic base-pair sequences.

Choose the answer from the options given below:

(1) A and E only (2) D and E only (3) A and B only (4) C and D only

111. Arrange the following steps of DNA fingerprinting in a correct sequence..

A. Isolation of DNA and its digestion by - restriction endonucleases.
B. Hybridisation using Labelled VNTR probe.
C. Transferring of separated DNA fragments to synthetic membranes
D. Detection of hybridised DNA fragments by autoradiography.
E. Separation of DNA fragments by electrophoresis.

Choose the correct answer from the options given below:

(1) A, B, D, C, E (2) A, E, C, B, D
(3) A, D, B, E, C (4) A, E, B, C, D

112. Find the incorrect statement(s) about photosynthesis from the following:

A. The water splitting complex is associated with PS L
B. C_4 plants use the C_3 pathway of CO_2 fixation as the main biosynthetic pathway.
C. In C_4 plants, photorespiration does not occur.
D. C_3 plants exhibit Kranz anatomy.
E. ATP synthesis in chloroplast occurs through chemiosmosis.

Choose the answer from the options given below:

(1) B and C only (2) B only (3) A and D only (4) B and E only

113. Arrange the following steps of somatic hybridisation in a correct sequence.

A. Digestion of cells walls
B. Isolation of naked protoplasts,
C. Fusion of protoplasts to get hybrid get hybrid protoplast.
D. Isolation of single cells from two different varieties of plants..
E. Growing of hybrid protoplast to form a new plant.

Choose the correct answer from the options given below:

(1) E, A, B, C, D (2) D, B, A, E, C
(3) E, B, A, D, C (4) D, A, B, C, E

114. The main function of bulliform cells in grasses is:

(1) to make the leaf impermeable to fungal spores.
(2) to perform photosynthesis.
(3) to minimize water loss during water stress.
(4) to transport water.



125. Exploring molecular, genetic and species-level diversity for products of economic importance is called:
 (1) Biomagnification (2) Bioremediation
 (3) Biofortification (4) Bioprospecting
126. **Match List I with List II:**
List I: **List II:**
 A. Decomposition, I. Accumulation of dark coloured amorphous colloidal substance
 B. Detritus, II. Release of inorganic nutrients by the activity of microbes in soil
 C. Mineralisation III. Breaking down of complex organic matter into inorganic substances
 D. Humification IV. Dead remains of plants and animals including fecal matter
- Choose the correct answer from the options given below:
 (1) A-III, B-II, C-I, D-IV (2) A-I, B-II, C-III, D-IV
 (3) A-IV, B-III, C-I, D-II (4) A-III, B-IV, C-II, D-I
127. Identify the correct statements about biomolecules.
 A. Lipids are generally water soluble. B. Proteins are polypeptides
 C. Polysaccharides are long chains of sugars. D. Adenine and guanine are substituted pyrimidines.
 E. Almost all enzymes are proteins.
- Choose the correct answer from the options given below:
 (1) C, D and E only (2) B, C and E only (3) B, D and E only (4) A, B and C only
128. In angiosperms, root hairs arise from which one of the following regions of the root?
 (1) Meristematic activity (2) Root cap
 (3) Maturation (4) Elongation
129. Which one of the following is not a characteristic of plant cells in the phase of elongation?
 (1) Large conspicuous nuclei. (2) Increased vacuolation
 (3) Cell enlargement (4) New cell wall deposition
130. Which of the following floral formula is the correct floral formula of Solanaceae family?
 (1) $\oplus \frac{\text{♂}}{\text{♀}} K_{(5)} C_{(5)} A_5 \underline{G}_{(2)}$ (2) $\oplus \frac{\text{♂}}{\text{♀}} K_5 C_{(5)} A_5 \underline{G}_{(2)}$
 (3) $\oplus \frac{\text{♂}}{\text{♀}} K_5 C_5 A_5 \underline{G}_{(2)}$ (4) $\oplus \frac{\text{♂}}{\text{♀}} K_{(5)} C_{(5)} A_5 \underline{G}_{(2)}$
131. Which of the following statements are correct with reference to packaging of DNA helix?
 A. Histones are organized to form a unit of eight molecules called histone octamer.
 B. Histones are negatively charged basic proteins.
 C. Histones are rich in the basic amino acid residues lysine and arginine.
 D. The positively charged DNA is wrapped around the histone octamer to form nucleosome.
 E. The packaging of chromatin at higher levels requires an additional set of proteins called non-histone chromosomal proteins.
- Choose the correct answer from the options given below:
 (1) A, B and D only (2) B, D and E only
 (3) A, C and E only (4) C, D and E only
132. Which of the following statements are correct with respect to DNA separation, isolation and visualization?
 A. The cutting of DNA is done by molecular scissors.
 B. The DNA fragments separate according to their size in an agarose gel, upon electrophoresis.
 C. The separated DNA fragments can be seen without staining when exposed to UV light.
 D. The separated DNA fragments, when stained with ethidium bromide, can be seen in visible light.
- Choose the correct answer from the options given below:
 (1) B and C only (2) B and D only
 (3) A and B only (4) A and D only

133. Alpha-helix is found in which level of protein structure ?
 (1) Tertiary structure (2) Quaternary structure
 (3) Secondary structure (4) Primary structure
134. Match List I with List II:
List I:
 A. Productivity
 B. Net primary productivity
 C. Gross primary productivity
 D. Secondary productivity
 Choose the correct answer from the options given below:
 (1) A-III, B-I, C-IV, D-II (2) A-I, B-II, C-III, D-IV
 (3) A-III, B-I, C-II, D-IV (4) A-I, B-III, C-IV, D-II
- List II:**
 I. Gross primary productivity minus respiration losses
 II. Rate of formation of new organic matter by consumers
 III. Rate of biomass production
 IV. Rate of production of organic matter during photosynthesis
135. Match List I with List II:
List I: (Placentation)
 A. Marginal
 B. Axile
 C. Parietal
 D. Basal
 (1) A-I, B-III, C-II, D-IV (2) A-IV, B-II, C-I, D-III
 (3) A-II, B-IV, C-I, D-III (4) A-III, B-I, C-IV, D-II
- List II:**(Example)
 I. Mustard
 II. Pea
 III. Marigold
 IV. Lemon
136. Choose the correct statements regarding frog's anatomy:
 A. Hepatic portal system is the special venous connection between liver and intestine.
 B. There are twelve pairs of cranial nerves arising from the brain.
 C. The ureters and oviducts open separately into the cloaca in female frogs.
 D. Hind-brain consists of cerebellum, medulla oblongata and optic lobes.
 E. Sinus venosus joins the right atrium of heart
 Choose the correct answer from the options given
 (1) B and D only (2) A, B and C only
 (3) A, C and E only (4) B and C only
137. The flightless bird with forelimbs modified as paddle-like structures suited for swimming is known as:
 (1) *Aptenodytes* (2) *Neophron* (3) *Psittacula* (4) *Struthio*
138. Male frogs can be distinguished from female frogs due to the presence of
 A. Bulging eyes B. Vocal sacs
 C. Webbed digits in feet D. Copulatory pad on first digit of fore limbs...
 E. Olive green-coloured skin with dark irregular spots
 Choose the correct answer from the options given
 (1) B and D only (2) B and C only (3) A and B only (4) C and E only
139. A group of researchers procured some fish-like animals and upon investigation the following characters were observed:
 A. Endoskeleton was made of cartilage.
 B. Ectoparasitic; as they were found attached on fish skin with their circular sucking mouth.
 C. Paired fins and scales were absent, but 7 pairs of gill slits were present
 Which of the following species of animals did they consider to fit best with these characters ?
 (1) *Petromyzon sp.* (2) *Branchiostoma sp.*
 (3) *Scoliodon sp.* (4) *Exocoetus sp.*
140. In humans, respiration occurs in the following steps. Arrange these steps in the correct order.
 A. Diffusion of O_2 and CO_2 between blood and tissues
 B. Diffusion of O_2 and CO_2 across alveolar membrane

C. Pulmonary ventilation by which atmospheric air is drawn in and CO₂ rich alveolar air is released out

D. Cellular respiration

E. Transport of gases by the blood

Choose the correct answer from the options given below:

(1) A, B, C, D, E (2) E, A, C, D, B (3) C, B, E, A, D (4) C, A, B, E, D

141. Non-membrane bound cell organelles found in both prokaryotic and eukaryotic cells are

(1) Mitochondria (2) Lysosomes (3) Centrosomes (4) Ribosomes

142. Choose the correct statement regarding GIFT to overcome infertility.

(1) Ova collected from a female donor are transferred to the uterus of an infertile female.

(2) Early embryos with up to 8 blastomeres are transferred into the fallopian tube of an infertile female.

(3) It is the transfer of an ovum collected from a donor into the fallopian tube of another female who cannot produce ovum but can provide suitable environment for fertilization and development.

(4) Early embryos with up to 8 blastomeres are transferred to the uterus of an infertile female.

143. Choose the correct statements regarding muscle contraction.

A. A motor neuron carries a signal sent by the Central Nervous System (CNS) to the sarcolemma of the muscle fibre.

B. The neural signal generates an action potential which causes the release of Ca²⁺ into sarcoplasm.

C. Increase in Ca²⁺ inactivates the actin for breaking cross bridges.

D. Actin binds to the myosin head to form a cross bridge

E. Shortening of sarcomere takes place, by pulling actin filaments towards the centre of 'A' band

Choose the correct answer from the options given below:

(1) C and E only

(2) A, B, D and E only

(3) A and B only

(4) C and D only

144. Insertion of a foreign DNA at BamHI site in an E. coli cloning vector pBR322 results in the loss of antibiotic resistance towards:

(1) Ampicillin and tetracycline

(2) Tetracycline

(3) Ampicillin

(4) Gentamycin

145. The specific receptors for neurotransmitters in a synapse are present on Post-synaptic membrane

(1) Post-synaptic membrane

(2) Pre-synaptic membrane

(3) Myelin sheath

(4) Schwann cell

146. Which of the following statements are correct with reference to human endoskeleton ?

A. Human skull is monocondylic.

B. The joint between any two adjoining vertebrae is a cartilaginous joint.

C. In human beings the number of cervical vertebrae is seven

D. All ribs except the last 2 pairs are bicephalic.

E. The occipital bone of skull is articulated with 1 atlas vertebra.

Choose the correct answer from the options given below:

(1) B, C and E only

(2) C, D and E only

(3) A, B and D only

(4) B and E only

147. The human protein named α -1-antitrypsin, obtained from transgenic animals, is used for the treatment of

(1) Alzheimer's

(2) Emphysema

(3) Cystic fibrosis

(4) Rheumatoid arthritis

148. Select the incorrect statements with reference to Rh grouping. to

A. Erythroblastosis foetalis is a condition observed having foetus with Rh^{-ve} blood and 1 mother with Rh^{+ve} blood.

B. Rh antigen is observed on RBCs in the majority of human beings.

C. Before blood transfusion, Rh group should also be matched.

D. Rh incompatibility is observed when a pregnant mother is Rh^{-ve} and the foetus is Rh^{+ve}

E. Erythroblastosis Foetalis can be avoided by administering anti-Rh antibodies to the mother immediately



after the delivery of the second child.

Choose the answer from the options given below:

- | | |
|------------------|------------------|
| (1) B and C only | (2) A and B only |
| (3) A and E only | (4) C and D only |

149. Match Drug with Effect:

List I (Drug)

- A. Nicotine,
B. Morphine,
C. Heroin,
D. Cocaine

List II (Effect)

- I. Causes sense of euphoria and increased energy
II. Stimulates adrenal gland to release catecholamines into blood circulation
III. Effective sedative and painkiller
IV. A depressant; slows down body function

Choose the correct answer from the options given below:

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

150. Match List I with List II related to muscular/skeletal system:

List I:

- A. Tetany,
B. Arthritis,
C. Myasthenia gravis,
D. Muscular dystrophy

List II:

- I. Inflammation of joints
II. Autoimmune disorder affecting neuromuscular junction
III. Wild contraction in muscle due to low Cat in body fluid
IV. Progressive degeneration of skeletal muscle dystrophy

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

151. Match IUD/Contraceptive:

List I:

- A. Progestasert,
B. Multiload 375,
C. Diaphragm,
D. Saheli

List II:

- I. Barrier made of rubber used by females
II. Oral contraceptive
III. Hormone releasing IUD
IV. Copper releasing IUD

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

152. Select the correct statements regarding cell membrane in eukaryotic cell.

- A. Membrane of human RBCs has approximately 52% protein.
B. Major phospholipids are arranged in a bilayer.
C. Extensions of the plasma membrane into the cell form mesosomes.
D. Tails towards the inner part of lipids are hydrophobic and thus protected from aqueous medium.
E. Glycocalyx is present on the outer surface of the plasma membrane..

Choose the correct answer from the options given below:

- | | |
|---------------------|---------------------|
| (1) C, D and E only | (2) B, C and E only |
| (3) A, C and E only | (4) A, B and D only |

153. Choose the correct statements regarding cell organelles and their inclusions..

- A. The endomembrane system includes Golgi complex, endoplasmic reticulum and mitochondria!
B. Rough endoplasmic reticulum bears ribosomes on its surface
C. Both mitochondria and plastids have circular DNA..
D. A network of microtubules, microfilaments and intermediate filaments present in the cytoplasm is called cytoskeleton.
E. Mitochondrion is a single membrane-bound structure.

Choose the correct answer from the options given below:

- | | | | |
|---------------------|------------------|---------------------|---------------------|
| (1) A, B and C only | (2) A and B only | (3) C, D and E only | (4) B, C and D only |
|---------------------|------------------|---------------------|---------------------|



154. Match List I with List II related to embryonic development at various months of pregnancy:
- List-I:**
- A. The foetus movement starts 4 and hair appears on the head
 - B. The foetus develops and digits limbs
 - C. The foetus develops external genital organs
 - D. The foetus body is covered. with fine hair; eyelids separate and eyelashes are formed
- List II:**
- I. 24 weeks,
 - II. 20 weeks,
 - III. 8 weeks,
 - IV. 12 weeks
- (1) A-II, B-IV, C-III, D-I (2) A-III, B-II, C-IV, D-I
(3) A-II, B-III, C-IV, D-I (4) A-IV, B-II, C-III, D-I
155. Which one of the following is an appropriate example of sexual deceit ?
- (1) Sea anemone and clown fish (2) Female wasp and dig
(3) Ophrys and bumblebee (4) Cuckoo and crow
156. Select the set of fishes which belong to the class Osteichthyes:
- (1) Saw fish, Fighting fish and Dog fish (2) Devil fish, Cuttlefish and Hagfish
(3) Flying fish, Angel fish and Fighting fish (4) Starfish, Hagfish and Cuttlefish
157. Match List I with List II with respect to chronology of evolution of life forms:
- List-I:**
- A. About 65 mya
 - B. About 500 mya
 - C. About 350 mya,
 - D. About 320 mya
- List II:**
- I. Javiless fish probably -evolved
 - II. The dinosaurs suddenly disappeared from the earth
 - III. Seaweeds and few plants probably existed
 - IV. Invertebrates were formed and became active
- Choose the correct answer from the options given below:
- (1) A-II, B-IV, C-I, D-III (2) A-I, B-II, C-III, D-IV
(3) A-II, B-IV, C-III, D-I (4) A-II, B-IV, C-III, D-II
158. In which animal do haploid cells divide mitotically to produce gametes ?
- (1) Male frogs (2) Male honeybees
(3) Male grasshoppers (4) Male earthworms
159. The WBC count of a person's blood sample is 8000/cu.mm. How many eosinophils and 2 lymphocytes would be in the same blood sample approximately?
- (1) 300 500/cu.mm.and 500 700/cu.mm, respectively
(2) 300-500/cu.mm and 1200-1500/cu.mm, respectively
(3) 3100-120/cu.mm and 160 200/cu.mm, respectively
(4) 160-240/cu.mm and 1600-2000/cu.mm, respectively
160. What is the probability of having children with 'O' blood group, where both mother and father are heterozygous for 'A' and 'B' blood group, respectively
- (1) 50% (2) 75% (3) 0% (4) 25%
161. Arrange the following events occurring in Renin-Angiotensin mechanism in the correct order:
- A. Increase in blood pressure and Glomerular filtration rate.
 - B. Reabsorption of Na and water from distal parts of tubule due to Aldosterone.
 - C. Fall in Glomerfar filtration rate.
 - D. Vasoconstriction by Angiotensin II and release of Aldosterone.
 - E. Renin convers Angiotensinogen Angiotensin I, followed by Angiotensin II. into
- Choose the correct answer from the options given below:



- 

C. Cholecystokinin

D. Progesterone

III. Stimulates reabsorption of Na and water from Renal tubule

IV. Stimulates secretion of pancreatic enzymes and bile juice

Choose the correct answer from the options given below:

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

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

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

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

169. Arrange the following cell layers/structures 8 around the female gamete, from outer to inner side:

A. Zona pellucida

B. Perivitelline space

C. Corona radiata

D. Plasma membrane of ovum

Choose the correct answer from the options given below:

(1) C, A, D, B

(2) C, A, B, D

(3) D, B, A, C

(4) A, C, B, D

170. Which of the following equations depicts Verhulst-Pearl logistic population growth?

(1) $\frac{dN}{dt} = rN \left(\frac{K - N}{N} \right)$

(2) $\frac{dN}{dt} = rN \left(\frac{K - N}{K} \right)$

(3) $\frac{dN}{dt} = rN \left(\frac{K}{K - N} \right)$

(4) $\frac{dN}{dt} = rN \left(\frac{K + N}{K} \right)$

171. The toxin proteins isolated from *Bacillus thuringiensis*, coded by which of the following genes would control cotton bollworms and corn borer, respectively?(1) *cryIAC* and *cryIAB*(2) *cryIIAB* and *cryIAC*(3) *cryIAC* and *cryIIIAB*(4) *cryIAC* and *cryIIAB*

172. The JGA (Juxta Glomerular Apparatus) is a special sensitive region formed by cellular modifications in _____ related to the same.

(1) Proximal convoluted tubule and afferent renal arteriole

(2) Distal convoluted tubule and efferent renal arteriole

(3) Proximal convoluted tubule and efferent renal arteriole

(4) Distal convoluted tubule and afferent renal

173. Match List I with List II:

List-I:

A. Molluscs

B. Reptiles

C. Adult amphibians

D. Amoeba

List II:

I. Pulmonary respiration only

II. Branchial respiration

III. Cellular respiration

IV. Pulmonary and Cutaneous respiration

Choose the correct answer from the options given below:

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

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

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

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

174. The sixth mutant codon of beta globin gene causing polymerization of Haemoglobin and change in RBC shape is

(1) CAG

(2) GUG

(3) AUG

(4) GAG

175. In a population of a grasshopper species, the chromosome number of some members is 23 and some other members possess 24 chromosomes. The 23 and 24 chromosome-bearing members in this species are:

(1) females and males, respectively

(2) all males

(3) males and females, respectively

(4) all females

176. Select the **incorrect** statements from the following:

A. Digestive system in Platyhelminthes is incomplete.

B. Bilateral symmetry is a characteristic feature of adult Echinoderms.

C. Pseudocoelom is possessed by Aschelminthes.

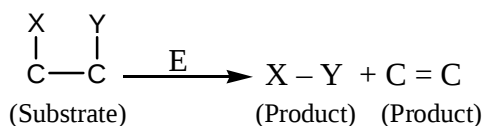
D. Notochord is persistent throughout life in the class Chondrichthyes.



E. Members of class Reptilia maintain a constant body temperature.

- (1) A and C only (2) B and E only (3) C and D only (4) B and D only

177. The following reaction depicts the activity of a particular class of enzymes:



Identify the enzyme class 'E' from the following options:

- (1) Ligases (2) Transferases (3) Lyases (4) Isomerases

178. Ecological pyramids represent the relationship between the organisms at different trophic levels and they are generally inverted for:

- (1) Pyramid of biomass in grassland
(2) Pyramid of biomass in sea
(3) Pyramid of number in grassland
(4) Pyramid of energy in pond ecosystem

179. Evolution of human appears parallel to the progressive development of brain and language skills. As such, the evolution of individual species in the sequence of their appearance is:

- (1) Ramapithecus → Homo habilis → Homo erectus → Neanderthal → Homo sapiens
(2) Homo habilis → Homo erectus → Ramapithecus → Neanderthal → Homo sapiens
(3) Homo sapiens → Ramapithecus → Homo habilis → Neanderthal → Homo erectus
(4) Neanderthal → Ramapithecus → Homo habilis → Homo erectus → Homo sapiens

180. Match List I (Respiratory Volume) with List II (Capacity in mL):

List I:

- (A) ERV (Expiratory Reserve Volume)
(B) RV (Residual Volume)
(C) IRV (Inspiratory Reserve Volume)
(D) TV (Tidal Volume)

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

List II:

- (I) 2500 – 3000 mL,
(II) 500 mL,
(III) 1000 – 1100 mL,
(IV) 1100 – 1200 mL

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