JUPITER ACADEMY

FULL TEST4 PHYSICS

NEET-UG - Physics

Time Allowed: 1 hour **Maximum Marks: 180**

General Instructions:

ANSWER 45 QUESTIONS

Attempt any 45 questions

1. The dimension of angular velocity is **[4]**

   a) $[M^2L^0T^{-1}]$ b) $[MLT^{-2}]$

   c) $[M^0L^0T^{-1}]$ d) $[ML^2T^{-2}]$

2. The SI unit of power is: **[4]**

   a) erg b) newton

   c) joule d) watt

3. **Assertion (A):** The cross product of a vector with itself is a null vector. **[4]**
   Reason (R): The cross-product of two vectors results in a vector quantity.

   a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

   c) A is true but R is false. d) A is false but R is true.

4. A goods train 100 m long is moving towards north with a velocity of 10 ms^{-1}. A bird also flies due north with a velocity 15 m s^{-1}, parallel to the train. The time taken by the bird to overtaken the train is: **[4]**

   a) 10 s b) 20 s

   c) 4 s d) 40 s

5. Two vectors $\vec{A}$ and $\vec{B}$ inclined at an angle θ have a resultant C which makes an angle β with $\vec{A}$. If the directions of $\vec{A}$ and $\vec{B}$ are interchanged, the resultant will have the same **[4]**

   a) magnitude b) direction

   c) direction as well as magnitude d) Angle

6. **Assertion (A):** The trajectory of projectile is quadratic in x and linear in y. **[4]**
   Reason (R): y component of trajectory is independent of x-component.

   a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

   c) A is true but R is false. d) A is false but R is true.

7. A child of mass 5 kg is going round a merry-go-round that makes 1 rotation in 3.14 s. The radius of the merry-go-round is 2 m. The centrifugal force on the child will be **[4]**

   a) 40 N b) 100 N

c) 50 N

d) 80 N

8. A spacecraft of mass M and moving with velocity v suddenly breaks in two pieces of the same mass m. After the explosion one of the masses m becomes stationary. What is the velocity of the other part of craft? **[4]**

a) $\frac{Mv}{m}$

b) v

c) $\frac{Mv}{M-m}$

d) $\frac{M-m}{m}$v

9. The dimension of k in the equation W = $\frac{1}{2}$ kx^2 is **[4]**

a) $[M^1L^0T^{-2}]$

b) $[M^1L^1T^{-2}]$

c) $[M^1L^0T^{-1}]$

d) $[M^0L^1T^{-1}]$

10. A thin uniform rod of length 2l and mass M is acted upon a constant torque. The angular velocity changes from zero to ω in time t. The value of torque is: **[4]**

a) $\frac{Ml^2\omega}{3t}$

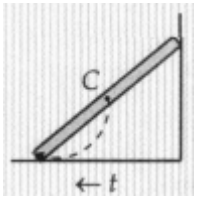
b) $\frac{2Ml^2\omega}{3t}$

c) $\frac{Ml^2\omega}{12t}$

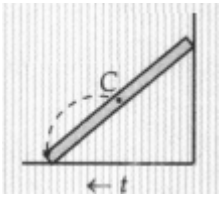
d) $\frac{Ml^2\omega}{t}$

11. A ladder is leaned against a smooth wall and it is allowed to slip on a frictionless floor. Which figure represents trace of its centre of mass? **[4]**

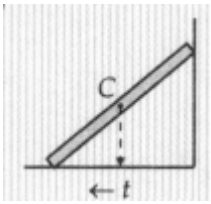
a)



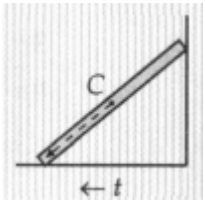
b)



c)



d)



12. The escape velocity from earth is 11.2 km/s. If a body is to be projected in a direction making an angle 45° to the vertical, then the escape velocity is: **[4]**

a) 11.2 km/s

b) $\frac{11.2}{\sqrt{2}}$ km/s

c) 11.2 $\times$ 2 km/s

d) $11.2\sqrt{2}$ km/s

13. A and B are two wires. The radius of A is twice that of B. They are stretched by the same load. Then, the stress on B is **[4]**

a) four times that on A

b) equal to that on A

c) two times that on A

d) half that on A

14. **Assertion:** In taking into account the fact that any object, which floats must have an average density less than that of water, during World War I, a number of cargo vessels were made of concrete. **[4]**
Reason: Concrete cargo vessels were filled with air.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is

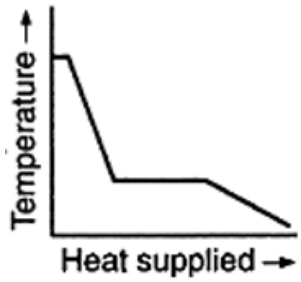
d) Assertion is wrong statement but reason is

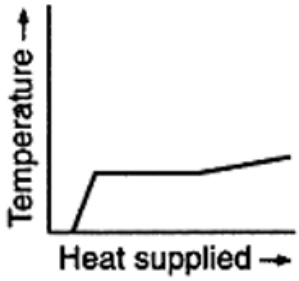
wrong statement. correct statement.

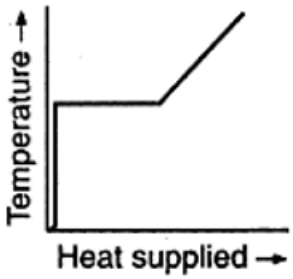
15. On a cold morning, a metal surface will feel colder to touch than a wooden surface, because **[4]**

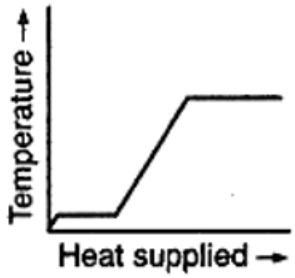
a) metal has low specific heat
b) metal has high thermal conductivity
c) metal has low thermal conductivity
d) metal has high specific heat

16. A block of ice at -10°C is slowly heated and converted to steam at 100°C. Which of the following curves represents this phenomenon qualitatively? **[4]**

a)


b)


c)


d)


17. **Assertion:** If two bodies are in thermal equilibrium in one frame, they will be in thermal equilibrium in all frames. **[4]**

Reason: The transfer of energy from a hot body to a cold body is a non mechanical process, i.e., the energy is transferred from one body to the other, without any mechanical work.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c) Assertion is correct statement but reason is wrong statement.
d) Assertion is wrong statement but reason is correct statement.

18. Two moles of an ideal gas ($\gamma = 1.4$) expands slowly and adiabatically from a pressure of 5.00 atm and a volume of 12.0 L to a final volume of 30.0 L. What is the final pressure of the gas? **[4]**

a) 1.39 atm
b) 1.09 atm
c) 1.19 atm
d) 1.59 atm

19. Calculate the change in internal energy of 3.00 mol of helium gas when its temperature is increased by 2.00 K. **[4]**

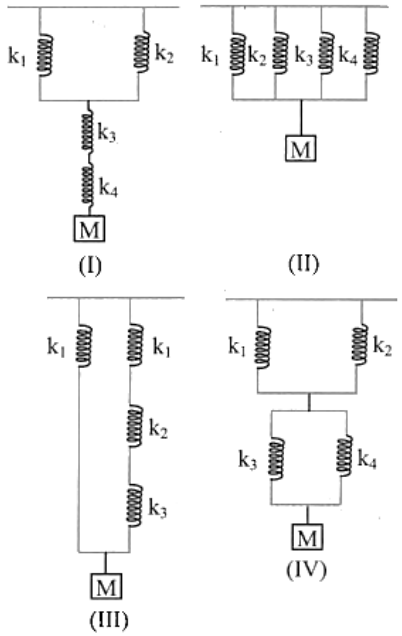
a) 85.0 J
b) 75.0 J
c) 65.0 J
d) 95.0 J

20. A block of mass 0.1 kg is connected to an elastic spring of spring constant 640 Nm^{-1} and oscillates in a medium of constant 10^{-2} kg s^{-1}. The system dissipates its energy gradually. The time taken for its mechanical energy of vibration to drop to half of its initial value is closest to: **[4]**

a) 2 s
b) 7 s

c) 5 s d) 7 s

21. In the following four configuration, if T_1, T_2, T_3 and T_4 are the time period of oscillators of I, II, III and IV respectively, then which of the following expression is correct? ($k_1 = k_2 = k_3 = k_4 = 1$) **[4]**



a) $T_I > T_{II} > T_{III} > T_{IV}$ b) $T_{IV} > T_{III} > T_I > T_{II}$

c) $T_{IV} > T_{III} > T_{II} > T_I$ d) $T_{III} > T_I > T_{IV} > T_{II}$

22. **Assertion (A):** In a stationary wave, the velocity of particles while crossing the mean position varies from maximum at the antinodes to minimum at the nodes. **[4]**

Reason (R): Amplitude of oscillation is maximum at the antinodes and zero at nodes. All particles between two successive nodes cross the mean position at the same time.

a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

23. Which of the following is not true for a region with uniform electric field? **[4]**

a) it may contain dipoles b) it may have uniformly distributed charge

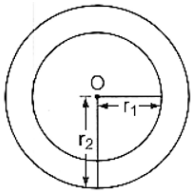
c) it may have formly distributed charge d) it can have free charges

24. Two small equal point charges of magnitude q are suspended from a common point on the ceiling by insulating mass less strings of equal lengths. They come to equilibrium with each string making angle θ from the vertical. If the mass of each charge is m, then the electrostatic potential at the centre of line joining them will be $\left(\frac{1}{4\pi\epsilon_0} = k\right)$. **[4]**

a) $\sqrt{\frac{kmg}{\tan\theta}}$ b) $4\sqrt{\frac{kmg}{\tan\theta}}$

c) $\sqrt{kmg\tan\theta}$ d) $2\sqrt{kmg\tan\theta}$

25. In the given figure, a hollow spherical capacitor is shown. The electric field will not be zero at: **[4]**



a) $r < r_1$ b) $r < r_2$

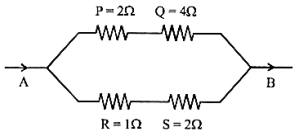
c) $r_1 < r < r_2$ d) $r_1 < r_2$

26. The potential at a point P due to an electric dipole is 1.8×10^5 V. If P is at a distance of 50 apart from the centre O of the dipole and if CP makes an angle 60^o with the positive side of the axial line of the dipole, what is the moment of the dipole? **[4]**

a) 10^{-4} C-m b) 10^{-5} C-m

c) 10 C-m d) 10^{-3} C-m

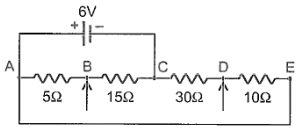
27. Which of the four resistances P, Q, R and S generate the greatest amount of heat when a current flows from A to B? **[4]**



a) R b) Q

c) S d) P

28. Four resistors are connected as shown in the following figure. A 6 V battery of negligible resistance is connected across terminals A and C. The potential difference across terminals B and D will be: **[4]**



a) 1.5 volt b) 0 volt

c) 3 volt d) 2 volt

29. An electron moving in a uniform magnetic field of induction of intensity B has its radius directly proportional to: **[4]**

a) Displace b) its charge

c) speed d) magnetic field

30. A circular loop carrying a current is replaced by an equivalent magnetic dipole A point on the axis of the loop is: **[4]**

a) neither an end-on position and a broad-side-on position b) an end-on position

c) a broad-side-on position d) both an end-on position and a broad-side-on position

31. **Assertion (A):** The resultant magnetic field of the circular loop is due to x-component. **[4]**
Reason (R): In the circular loop of wire, perpendicular components of the magnetic field at some distance from centre of the loop are turned over the whole loop, the result is zero.

a) Both A and R are true and R is the correct b) Both A and R are true but R is not the

explanation of A.

correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

32. The magnetic moment of a revolving electron around the nucleus varies with principal quantum number n as **[4]**

a) $\mu \propto n$

b) $\mu \propto \frac{1}{n^2}$

c) $\mu \propto n^2$

d) $\mu \propto \frac{1}{n}$

33. Two ends of a horizontal conducting rod of length l are joined to a voltmeter. The whole arrangement moves with a horizontal velocity v, the direction of motion being perpendicular to the rod. Vertical component of the earth's magnetic field is B. The voltmeter reads **[4]**

a) Blv only if the rod moves eastward

b) Blv if the rod moves in any direction

c) Zero

d) Blv only if the rod moves westward

34. The current flowing through an ac circuit is given by I = 5sin (120πt)A **[4]**

How long will the current take to reach the peak value starting from zero?

a) $\frac{1}{240}$ s

b) $\frac{1}{60}$

c) 60s

d) $\frac{1}{120}$ s

35. **Assertion (A):** Capacitor serves as a block for dc and offers an easy path to ac. **[4]**

Reason (R): Capacitive reactance is inversely proportional to frequency.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

36. A carbon dioxide laser emits a sinusoidal electromagnetic wave that travels in vacuum in the negative x-direction. The wavelength is 10.6μm and the field is parallel to the z-axis, with E_{max} = 1.5 MV/m. Vector equation for E as function of time and position is **[4]**

a) E(x, t) = -E_{max} cos $\left(5.93 \times 10^5\ x + 1.78 \times 10^{14}\ t\right)$

b) E(y, t) = E_{max} cos $\left(5.93 \times 10^5\ y - 1.78 \times 10^{14}\ t\right)$

c) E(x, t) = E_{max} cos $\left(5.93 \times 10^5\ x + 1.78 \times 10^{14}\ t\right)$

d) E(y, t) = E_{max} cos $\left(5.93 \times 10^5\ y + 1.78 \times 10^{14}\ t\right)$

37. The quality of X-rays is determined by: **[4]**

a) potential difference

b) pressure inside the tube

c) filament current

d) filament voltage

38. A convex lens is dipped in a liquid whose refractive index is equal to the refractive index of the lens. Then its focal length will: **[4]**

a) Become infinite

b) Become zero

c) Reduce

d) Remain same as in air

39. **Assertion (A):** A ray of white light shows no dispersion on emerging from a glass slab although there occurs dispersion inside the glass slab. **[4]**

Reason (R): The velocity of light inside the glass slab is same for all different colours.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

40. The maximum number of possible interference maxima when slit separation is equal to 4 times the wavelength of light used in a double slit experiment is: **[4]**

a) ∞

b) 4

c) 9

d) 8

41. When the energy of the incident radiation is increased by 20%, the kinetic energy of the photoelectrons emitted from a metal surface increased from 0.5 eV to 0.8 eV. The work function of the metal is: **[4]**

a) 1.0 eV

b) 0.65 eV

c) 1.5 eV

d) 1.3 eV

42. The work function for metals A, B, and C are respectively 1.92 eV, 2.0 eV, and 5 eV. According to Einstein's equation, the metals which will emit photoelectrons for radiation of wavelength 4100 $\mathring{A}$ is/are: **[4]**

a) none

b) all the three metals

c) A only

d) A and B only

43. Using the Bohr's model, calculate the orbital period of the electron in a hydrogen atom in the n = 1 level. **[4]**

a) 1.42×10^{-16} s

b) 3.62×10^{-16} s

c) 1.52×10^{-16} s

d) 5.72×10^{-16} s

44. **Assertion (A):** The force of repulsion between atomic nucleus and α-particle varies with distance according to inverse square law. **[4]**

Reason (R): Rutherford did α-particle scattering experiment.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

45. Energy released in nuclear fission is due to **[4]**

A. some mass is converted into energy

B. total binding energy of fragments is more than the binding energy of parental element

C. total binding energy of fragments is less than the binding energy of parental element

D. total binding energy of fragments is equal to the binding energy of parental element.

a) (C)

b) (B)

c) (D)

d) (A)

46. For nuclear forces to be effective, the distance should be: **[4]**

a) 10^{-15} m

b) 10^{-13} m

c) 10^{-10} m

d) 10^{-20} m

47. Zener diode is fabricated by **[4]**

a) heavily doping the p side and lightly doping

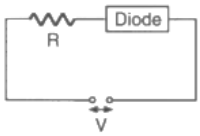
b) heavily doping p and n sides of the junction

the n side

c) heavily doping the n side and lightly doping the p side

d) lightly doping p and n sides of the juntion

48. For a given circuit of ideal p-n junction diode which of the following is correct? **[4]**



a) In reverse biasing the voltage across R is 2V

b) In forward biasing, the voltage across R is V

c) In forward biasing the voltage across R is 2V

d) In reverse biasing the voltage across R is V

49. **Assertion (A):** A p-n junction with reverse bias can be used as a photo-diode to measure light intensity. **[4]**
Reason (R): In a reverse bias condition the current is small but it is more sensitive to changes in incident light intensity.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

50. The current gain of a transistor is 100. When the base current changes by 200 μA, the collector current changes by: **[4]**

a) 2 mA

b) 200 mA

c) 0.2 mA

d) 20 mA

51. In the measurement of resistance by a meter bridge, the known and the unknown resistances are interchanged to eliminate: **[4]**

a) index error

b) error due to thermoelectric effect

c) random error

d) end error

JUPITER ACADEMY

Chemistry Model paper 4
NEET-UG - CHEMISTRY

Time Allowed : 50 mins **Maximum Marks :** 204

General Instructions:
Answer any 45 questions

Section A

1) A solution is prepared by adding 2 g of a substance A to 18 g of water. Mass percent of the solute is ____. **[4]**
   a) 20.5 % b) 1 2.11%
   c) 10 % d) 11 %

2) The molar mass of $AgBO_3$ is **[4]**
   a) 189.9 amu b) 159.9 u
   c) 179.9 g d) 165.9 u

3) Major development(s) responsible for the formulation of Bohr's model of atom were
   i. Duel character of the electromagnetic radiation
   ii. Experimental results regarding atomic spectra which can be explained only by assuming quantised electronic energy levels in atoms
   iii. Both (a) and (b)
   iv. None of these
   [4]
   a) Option (i) b) Option (iv)
   c) Option (iii) d) Option (ii)

4) Which of the following options does not represent ground state electronic configuration of an atom? **[4]**
   a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^1$
   b) $1s^2 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^9\ 4s^2$
   c) $1s^2\ 2s^2\ 2p^6\ 3s^2 3p^6\ 3d^5\ 4s^1$
   d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8\ 4s^2$

5) The correct decreasing order of chemical reactivities in terms of their oxidizing properties for F, Cl, O and N is: **[4]**
   a) O > F > N > Cl b) F > Cl > O > N
   c) F > O > Cl > N d) Cl > F > O > N

6) A transition metal ion exists in its highest oxidation state. It is expected to behave as: **[4]**
   a) A reducing agent
   b) An oxidising agent
   c) A central metal in a coordination compound
   d) A chelating agent

7) The condition to form a molecular orbital from atomic orbitals is **[4]**
   a) Only atomic orbitals must be in proper Asymmetry
   b) Atomic orbitals must have comparable energies and of proper symmetry
   c) Only atomic orbitals must be of comparable energies
   d) Only atomic orbitals must be in proper symmetry

8) During the formation of a chemical bond: **[4]**
   a) Energy of the system does not change
   b) Electron - electron repulsion becomes more than the nucleus - electron attraction
   c) Energy decreases
   d) Energy increases

9) Ionic crystalline compounds formed by ion - formation by electron transfer proves: **[4]**
   a) Valence Shell Electron Pair Repulsion VSEPR Theory
   b) Electronic theory of chemical bonding
   c) Valence Bond (VB) Theory
   d) Molecular Orbital (MO) Theory

10) Which of the following always has a negative value? **[4]**
   a) Heat of reaction b) Heat of solution
   c) Heat of formation d) Heat of combustion

11) Thermodynamics is the branch of physical science concerned with **[4]**
   a) Mass and its transformations to and from other forms of energy.
   b) Heat and its transformations to and from other forms of energy.
   c) Kinetic energy and its transformations to and from other forms of energy.
   d) Potential and its transformations to and from other forms of energy.

12) The boiling point of water at atmospheric pressure is ____. **[4]**
   a) 90° C b) 95° C
   c) 110° C d) 100° C

13) Of the following, which change will shift the reaction towards the product at equilibrium?
   $I_2(g) \rightleftharpoons 2I(g);\ \triangle H°\ (298\ K) = +150\ kJ$ **[4]**
   a) Decrease in concentration of I_2
   b) Increase in total pressure
   c) Increase in Temperature
   d) Increase in concentration of I

14) For reactions involving gases, however, it is usually more convenient to express the equilibrium constant in terms of **[4]**
   a) Molar concentration of the reactants
   b) Partial pressure
   c) Temperature
   d) Molar concentration of the products

15) The rates of transfer of molecules from ice into water and of reverse transfer from water into the ice are equal at atmospheric pressure and 273 K. Both the processes occur simultaneously and at the same rate so that the amount of ice and water remains constant. This process is called ____. **[4]**
   a) Dynamic equilibrium
   b) Liquid - Vapour Equilibrium

c) Ionic equilibrium
d) Liquid - Gas Equilibrium

16) Among the following, identify the species with an atom in +6 oxidation state: **[4]**
a) CrO_2Cl_2 b) NiF_6^{2-}
c) MnO_4^- d) $Cr(CN)_6^{3-}$

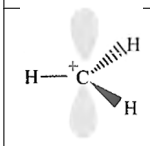
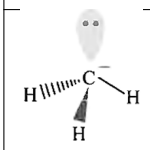
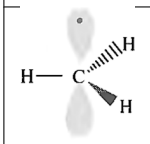
17) The equivalent mass of $MnSO_4$ is half of its molar mass when it is converted to: **[4]**
a) MnO_4^- b) MnO_2
c) Mn_2O_3 d) MnO_4^{2-}

18) Identify X and Y in the following reaction.
$X \xrightarrow{Na/K} B \xrightarrow[\Delta]{N_2} Y$ **[4]**
a) X = H_3BO_3, Y = BF_3 b) X = H_3BO_3, Y = BN
c) X = B_2O_3, Y = BN d) X = B_2O_3, Y = B_2N_3

19) $NaH_2PO_4 \xrightarrow[\text{Sodium trimetaphosphate}]{>240^\circ C} (NaPO_3)_3 \xrightarrow[\text{(liquid melt)}]{625^\circ C} NaPO_3$ → rapid cooling → D(glass)

Compound (D) is known as: **[4]**
a) Graham's salt b) Switzer's salt
c) Fischer's salt d) Microcosmic salt

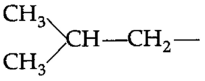
20) Complete the following table:

Intermediate	Geometry
	I
	II
	III

[4]

a) I⇒ Trigonal planar
II ⇒ Tetrahedral
III ⇒ Linear
b) I⇒ Linear
II ⇒ Pyramidal
III ⇒ Pyramidal
c) I⇒ Trigonal planar
II ⇒ Pyramidal
III ⇒ Trigonal planar
d) I⇒ Pyramidal
II ⇒ Pyramidal
III ⇒ Trigonal planar

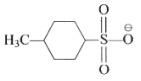
21) The structure of isobutyl group in an organic compound is: **[4]**

a) $CH_3 - CH_2 - CH_2 - CH_2$
b) $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} -$
c) $CH_3 - CH - CH_2 - CH_3$
d) 

22) Which of the following is the most stable carbocation (carbonium ion)? **[4]**

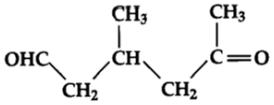
a) $C_6H_5\overset{+}{C}H_2$
b) $(CH_3)_3\overset{+}{C}$
c) $(CH_3)_2\overset{+}{C}H$
d) $CH_3CH_2^+$

23) The decreasing order of nucleophilicity among the nucleophile:

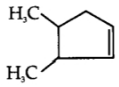
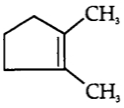
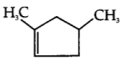
i. $CH_3 - \overset{O}{\overset{\|}{C}} - \overset{\ominus}{O}$
ii. $CH_3 - \overset{\ominus}{O}$
iii. $\overset{\ominus}{C}N$
iv. 

[4]
a) Ii , iii, i, iv b) Iii, ii, i, iv
c) I , ii , iii, iv d) Iv, iii , ii, i

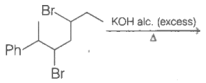
24) A single compound of the structure,



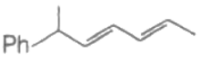
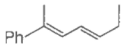
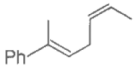
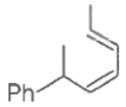
is obtainable from ozonolysis of which of the following cyclic compounds? **[4]**

a) 
b) 
c) 
d) 

25) The major product of the following reaction is: -



[4]

a) 
b) 
c) 
d) 

26) Select the correct statement. **[4]**

a) The components of an azeotropic solution can be separated by simple distillation.
b) 0.1 N solution of NaCl is hypertonic with respect to 0.1 N solution of Na_2SO_4.

c) The vapour pressure of a liquid depends on the size of the vessel.
d) Solvent particles move from hypertonic solution to hypotonic solution, if separated by semipermeable membrane.

27) 5 g of Na_2SO_4 was dissolved in x g of H_2O. The change in freezing point was found to be 3.82°C. If Na_2SO_4 is 81.5% ionised, the value of x
(K_f for water = 1.86°C kg mol^{-1}) is approximately:
(molar mass of S = 32 g mol^{-1} and that of Na = 23 g mol^{-1}) **[4]**
a) 45 g b) 65 g
c) 25 g d) 15 g

28) In dry cell, which of the following is reduced? **[4]**
a) Graphite b) Manganese dioxide
c) Ammonium chloride d) Zinc ions

29) The standard e.m.f. of a cell involving one electron change is found to be 0.591 V at 25°C. The equilibrium constant of the reaction is: **[4]**
a) 10^{10} b) 10^5
c) 10^1 d) 10^{30}

30) The rate of the elementary reaction, $2NO + O_2 \longrightarrow 2NO_2$ when the volume of the reaction vessel is doubled: **[4]**
a) Reduce to one - eight of its initial rate
b) Will grow eight times of its initial rate
c) Will grow four times of its initial rate
d) Reduce to one - fourth of its initial rate

31) A reaction is represented by the rate law $r = \frac{[O_3]^2}{[O_2]^a}$.
Of what order is the reaction in O_2 if the reaction is of the first - order overall? **[4]**
a) 1 b) - 1
c) 2 d) $-\frac{3}{2}$

32) Identify whether the following reactions depict oxidizing or reducing property of SO_2.
i. Reaction of SO_2 with lead dioxide.
ii. Reaction of SO_2 with ferrous chloride and hydrochloric acid.
iii. Reaction of SO_2 with Cl_2 and water.
iv. Reaction of SO_2 with potassium iodate and water.
[4]
a) I - oxidizing, ii - reducing, iii - oxidizing, iv - reducing
b) I - oxidizing, ii - reducing, iii - reducing, iv - oxidizing
c) I - reducing, ii - oxidizing, iii - reducing, iv - reducing
d) I - reducing, ii - oxidizing, iii - reducing, iv - oxidizing

33) Which of the following statements is CORRECT for HOClO? **[4]**
a) The oxidation state of Cl is +3.
b) The oxidation state of O is $-\frac{1}{2}$.
c) The oxidation state of O is - 1.
d) The oxidation state of Cl is - 1.

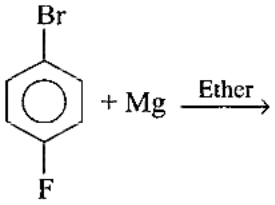
34) Which of the following metals corrodes readily in moist air? **[4]**
a) Silver b) Iron
c) Gold d) Nickel

35) Four elements A (with one valence electron), B (with three valence electrons), C (with five valence electrons) and D (with seven valence electrons) are lying in the second period of periodic table. Which of the following does not exist at room temperature? **[4]**
a) A_2 b) D_2
c) C_2 d) B_2

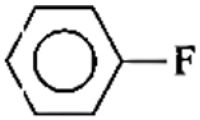
36) The complex $[Pt(NH_3)_4]^{2+}$ has _____ structure: **[4]**
a) Square planar b) Tetrahedral
c) Pentagonal d) Pyramidal

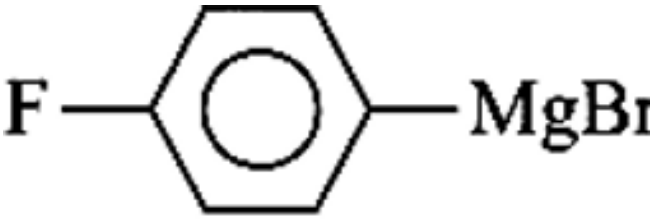
37) The oxidation states of Cr, in $[Cr(H_2O)_6]Cl_3$, $[Cr(C_6H_6)_2]$, and $K_2[Cr(CN)_2(O)_2(O_2)(NH_3)]$respectively are **[4]**
a) +3, +4 and +6 b) +3, 0 and +6
c) +3, 0 and +4 d) +3, +2 and +4

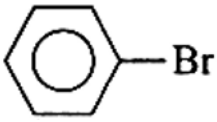
38) Which of the following is correct?

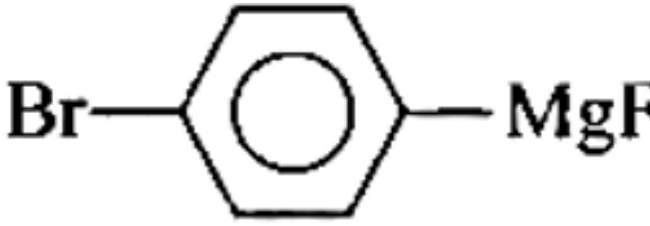


[4]

a) 

b) 

c) 

d) 

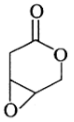
39) In fluorobenzene, the overlap is seen between _____. **[4]**
a) Sp^2 hybrid orbital of carbon and sp^3 orbital of fluorine
b) P - orbital of fluorine and sp^3 hybrid orbital of C - atom of benzene
c) Sp hybrid orbital of carbon and sp hybrid orbital of fluorine
d) P - orbital of fluorine and sp^2 hybrid orbital of C - atom of benzene

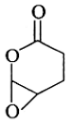
40) $CH_3CH_2 - C(=O) - Ph - CH_3$ cannot be prepared by **[4]**
a) $CH_3CH_2COCH_3$ + PhMgX
b) $PhCOCH_3$ + CH_3CH_2MgX
c) HCHO + $PhCH(CH_3)$ CH_2MgX
d) $PhCOCH_2CH_3$ + CH_3MgX

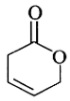
41) Among the alkenes which one produces tertiary butyl alcohol on acid hydration? **[4]**
a) $CH_3CH{=}CHCH_3$ b) $CH_3CH_2CH{=}CH_2$
c) $CH_3CH{=}CH_2$ d) $(CH_3)_2C{=}CH_2$

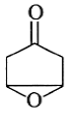
42) 

$\xrightarrow[Excess]{m-CPBA}$ Product; Find the product: **[4]**

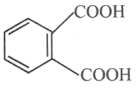
a) 

b) 

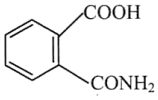
c) 

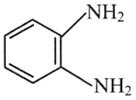
d) 

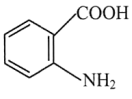
43) The major product of the following reaction is _____.

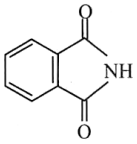


+ NH_3 $\xrightarrow{strong\ heating}$ **[4]**

a) 

b) 

c) 

d) 

44) P - Anisidine is _____. **[4]**

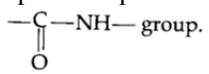
a) N - methoxybenzenamine
b) 4 - methylbenzenamine
c) 4 - methoxybenzenamine
d) N - methylbenzenamine

45) Which one of the following on reduction with $LiAlH_4$ yields a secondary amine? **[4]**

a) Methyl cyanide
b) Nitroethane
c) Acetamide
d) Methyl isocyanide

46) 

Which statement is incorrect about peptide bond? **[4]**

a) C - N bond length in proteins is longer than usual bond length of N - C bond structure
b) None of the these
c) C - N bond length in proteins is smaller than usual bond length of C - N bond.
d) Spectroscopic analysis shows planar of  group.

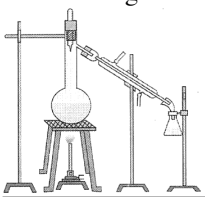
47) AGCT are nitrogenous bases of DNA. The pairing is: **[4]**

a) A - G, C - T
b) A - T, G - C
c) A - C, G - T
d) A - T, G - T

48) Which method will be useful for the separation of a mixture of benzene and chloro - benzene? **[4]**

a) Distillation
b) Crystallisation
c) Seperatory funnel
d) Sublimation

49) Which of the following pairs of solvents cannot be separated using the distillation apparatus shown below?



Solvent	Boiling point (K)
Ether	308
Acetone	329
Methanol	338
Aniline	457
Toluene	384

[4]

a) Ether and toluene
b) Ether and aniline
c) Methanol and toluene
d) Acetone and methanol

50) X + $CHCl_3$ + KOH $\longrightarrow$ Carbylamine

Y $\xrightarrow[\beta-Naphthol\ \text{in NaOH}]{HNO_2.0\ -\ 5^oC}$ Azo dye

Compounds X and Y are _____ and _____ respectively. **[4]**

a) 2 - phenylethan - 1 - amine and benzene - 1, 4 - diamine
b) Hexane - 1,6 - diamine and 4 - aminobutan - 2 - one
c) α - naphthylamine and benzylamine
d) Benzenamine and benzylamine

51) Lassaigne's test for the detection of N fails in: **[4]**

a) NH_2 - NH_2
b) $NH_2 - C(=O) - NH_2$
c) C_6H_5 - NH - NH_2
d) $NH_2 - \overset{O}{\overset{\|}{C}} - NH - NH_2$

JUPITER ACADEMY

BOTANY MODEL PAPER46-

NEET-UG - Biology

Time Allowed: 1 hour **Maximum Marks: 180**

General Instructions:

- For each correct response, the candidate will get 4 marks.
- For each incorrect response, one mark will be deducted from the total scores.

BOTANY (Section-A)

1. Wheat is grouped in which Order? **[4]**

   a) Poaceae
   b) Poales
   c) Anacardiaceae
   d) Sapindales

2. Who wrote **Species Plantarum** and provided a basis for the classification of plants? **[4]**

   a) Robert Hooke
   b) Charles Darwin
   c) Leeuwenhoek
   d) Carolus Linnaeus

3. Which one is the wrong pairing for the disease and its causal organism? **[4]**

   a) Late blight of potato - Alternaria solani
   b) Loose smut of wheat - Ustilago nuda
   c) Root knot of vegetables - Meloidogyne
   d) Black rust of wheat - Puccinia graninis

4. What are episomes? **[4]**

   a) Modification of the cell membrane performing respiration.
   b) Hereditary DNA of bacterial cell.
   c) Extrachromosomal hereditary material of bacteria associated with nucleoid.
   d) Both Hereditary DNA of bacterial cell and Extrachromosomal hereditary material of bacteria associated with nucleoid.

5. Egg apparatus comprises of: **[4]**

   a) Egg and polar nuclei
   b) Egg and antipodal cell
   c) Egg
   d) Egg and synergids

6. Which of the following statements about pteridophytes is true? **[4]**

   i. They are the first terrestrial plants to possess vascular tissues.
   ii. It found in cool, damp, shady places though some may found in sandy soil conditions.
   iii. The main plant body is gametophytic which is differentiated into root, stem and leaves.
   iv. The sporangia produce spores by mitosis in spore mother cells.
   v. Spores germinate to give rise to the prothallus.

   a) (i), (ii), (iii) and (v)
   b) All of these

c) (i), (ii), (iii) and (iv)
d) (i), (ii) and (v)

7. Protein-rich alga is: **[4]**

a) Spirulina
b) Chlamydomonas
c) Scytonema
d) Cosmarium

8. Point out the odd one. **[4]**

a) Micropyle
b) Embryo sac
c) Nucellus
d) Pollen grain

9. Formation of fruits without fertilization is known as: **[4]**

a) Parthenogenesis
b) Parthenocarpy
c) Polyembryony
d) Polygamy

10. Xylem translocates **[4]**

a) water, mineral salts, some organic nitrogen and hormones.
b) water and mineral salts only.
c) water only
d) water, mineral salts and some organic nitrogen only.

11. The floral organs arise from: **[4]**

a) Thalamus
b) Pedicel
c) Mother axis
d) Root

12. You are given a fairly old piece of dicot stem and a dicot root Which of the following anatomical structures will you use to distinguish between the two? **[4]**

a) Secondary xylem
b) Protoxylem
c) Secondary phloem
d) Cortical cells

13. In incomplete dominance, what is the ratio of Red : Pink : White flower if cross made between red and white flower plants. **[4]**

a) 1 : 2 : 2
b) 1 : 2 : 1
c) 1 : 1 : 2
d) 2 : 2 : 1

14. Who postulated the Chromosome Theory of Inheritance? **[4]**

a) Mendel
b) Sutton and Boveri
c) De Vries
d) Morgan

15. Which site of a tRNA molecule hydrogen binds to a mRNA molecule? **[4]**

a) Codon
b) Anticodon
c) $5'$ end of a tRNA molecule
d) $3'$ end of a tRNA molecule

16. Identify the incorrect statement for lac operon model. **[4]**

a) Regulation of lac operon by repressor is referred to as negative regulation.
b) Lactose acts as inducer which inactivates repressor.

c) RNA polymerase stays away from promoter in the presence of repressor.

d) The repressor of the operon is synthesised during specific periods from gene r.

17. In which of the following structure axoneme core present? **[4]**

a) More than one is correct

b) Centrioles

c) Flagella

d) Cilia

18. Match the columns and identify the correct option: **[4]**

(A) Thylakoids	(i) Disc-shaped sacs in Golgi apparatus
(B) Cristae	(ii) Condensed structure of DNA
(C) Cisternae	(iii) Flat membranous sacs in stroma
(D) Chromatin	(iv) Infoldings in mitochondria

a) A - (iii), B - (i), C - (iv), D - (ii)

b) A - (iv), B - (iii), C - (i), D - (ii)

c) A - (iii), B - (iv), C - (i), D - (ii)

d) A - (iii), B - (iv), C - (ii), D - (i)

19. Which one of the following is the correct statement regarding the particular psychotropic drug specified? **[4]**

a) Morphine leads to delusions and disturbed emotions

b) Barbiturates cause relaxation and temporary euphoria

c) Hashish causes after thought perceptions and hallucinations

d) Opium stimulates nervous system and causes hallucinations

20. Which of the following endoparasites of humans does show viviparity? **[4]**

a) Ascaris lumbricoides

b) Ancylostoma duodenale

c) Enterobius vermicularis

d) Trichinella spiralis

21. During which phase(s) of cell cycle, the amount of DNA in a cell remains at 4 C level if the 7. initial amount is denoted as 2C? **[4]**

a) G_0 and G_1

b) Only G_2

c) G_2 and M

d) G1 and S

22. Which of the following is true regarding exponential growth? **[4]**

a) Exponential growth is a commonly observed in large, slow-growing species such as humans and elephants

b) No population can grow exponentially for long

c) Bacterial colonies have been observed to maintain exponential growth always

d) Exponential growth slows down as the population nears its log phase

23. An inverted pyramid of ___(A)___ may occasionally be observed in ___(B)____ communities. **[4]**

a) (A)-biomass; (B)-marine

b) (A)-energy; (B)-forest

c) (A)-energy; (B)-grassland

d) (A)-biomass; (B)-grassland

24. Identify the incorrect statement: **[4]**

a) Eichornia crassipes is also called Terrer of

b) Algal blooms cause deterioration of water

Bengal

quality and fish mortality

c) Amount of organic matter in sewage can be estimated by measuring the Biochemical Oxygen Demand

d) Presence of large amounts of nutrients in water suppresses growth of planktons

25. A well known bird sanctuary of our country is situated at: **[4]**

a) Bharatpur

b) Kaziranga

c) Bandipur

d) Palamu

26. The Indian rhinoceros is a natural inhabitant of which one of the Indian states? **[4]**

a) Uttar Pradesh

b) Assam

c) Himachal Pradesh

d) Uttarakhand

27. Which of the following is not the example of recent extinction? **[4]**

a) Quagga

b) Dodo

c) Steller's sea cow

d) Pigeon

28. Number of meiotic divisions required to produce 100 macrospores in angiosperm/egg is: **[4]**

a) 25

b) 100

c) 125

d) 50

29. Four different steps that occur during mitosis are given in the following list: **[4]**

i. Cells do not show golgi complexes, endoplasmic reticulum, nucleolus and the nuclear envelope.

ii. Nucleolus, golgi complex and ER reform.

iii. Chromatids move to opposite poles.

iv. Chromosomes are moved to spindle equator and get aligned along metaphase plate through spindle fibres to both poles.

These steps would occur in the order

a) (i), (ii), (iv), (iii)

b) (ii), (i), (iii), (iv)

c) (i), (iii), (iv), (ii)

d) (i), (iv), (iii), (ii)

30. A student added DCMU to an illuminated suspension of an alga and found no evolution of oxygen. Then he added ferricyanide to the suspension and oxygen was evolved. Select the statement that gives the reason for evolution of oxygen **[4]**

a) All of these

b) Ferricyanide acted as electron acceptor and allows Hill reaction.

c) Ferricyanide removed the block of transfer of electrons between PS II and cytochrome b6-f.

d) Ferricyanide caused photolysis of water

31. In electron transport system molecules which gain electrons: **[4]**

a) Chlorophyll - b

b) Phycobillins

c) Cytochrome

d) Phytochrome

32. The **red-drop** phenomenon is due to the disruption of the photochemical activity of: **[4]**

a) Carotenoids
b) PS-l and PS-II both
c) PS-l
d) PS-II

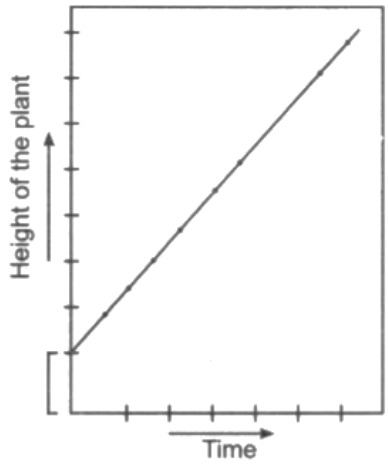
33. The technique used to separate photosynthetic pigments is **[4]**

a) gel electrophoresis
b) paper chromatography.
c) radio isotopic techniques
d) X-ray diffraction

34. The hydrogen acceptor in hexose monophosphate shunt is: **[4]**

a) TPN
b) NADP
c) NAD
d) NADP and TPN

35. Given graph represent which type of growth: **[4]**



a) Arithmetic growth and geometric growth
b) Geometric growth
c) Arithmetic growth
d) scalar growth

BOTANY (Section-B)

Attempt any 10 questions

36. More suitable term use for these name is - **Dogs**, **Cats**, **Mammals**, **Wheat**, **Rice**, **Plants** and **Animals** : **[4]**

a) Taxa
b) Categories
c) All of these
d) Taxonomy

37. Archaebacteria live in: **[4]**

a) Only in hot springs
b) All of these
c) Only salty areas
d) Only in marshy areas

38. "Ordines Anomali" of Bentham and Hooker includes **[4]**

a) Seed plants showing abnormal forms of growth and development
b) A few orders which could not be placed satisfactorily in the classification
c) Plants described in the literature but which Bentham and Hooker did not see in original
d) Plants described only in fossil state

39. Select the event that does not occur after double fertilisation. **[4]**

a) The pollen grain germinates on the stigma.
b) The primary endosperm nucleus develops into endosperm.
c) Two male gametes are discharged into the
d) Both (The pollen grain germinates on the

embryosac.

stigma) and (Two male gametes are discharged into the embryosac)

40. In anticlinal divisions, the plane of division is: **[4]**

a) Right angle to long axis of cell

b) Parallel to long axis of cell

c) Equatoria

d) Oblique to long axis of cell

41. The incorrect statement with regard to haemophilia is: **[4]**

a) It is recessive disease

b) It is A-linked disease

c) It is dominant disease

d) A single protein involved in the clotting of blood is affected

42. Feulgen reaction is a specific test for establishing the presence of: **[4]**

a) DNA

b) Sugar

c) Protein

d) RNA

43. Which of the following cell organelles serves as a primary packaging area for molecules that will be distributed throughout the cell? **[4]**

a) Golgi apparatus

b) Mitochondria

c) Ribosomes

d) Chloroplast

44. Baculo viruses (Nucleopolyhedro virus) do not show **[4]**

a) utility in IPM programme.

b) host specificity

c) effects on non-target pathogens.

d) narrow spectrum applications

45. Life without air is: **[4]**

a) Anaerobic

b) Impossible

c) Free from oxidative damage

d) Reductions

46. Which of the following plant species you would select for the production of bioethanol? **[4]**

a) Pongamia

b) Brassica

c) Zeamays

d) Jatropha

47. The flora and fauna in lakes or ponds are: **[4]**

a) Lotic biota

b) Abiotic biota

c) Lentic biota

d) Field layer

48. Farmers in a particular region were concerned that pre-mature yellowing of leaves of a pulse crop might cause a decrease in the yield. Which treatment could be most beneficial to obtain maximum seed yield? **[4]**

a) Treatment of the plants with cytokinins along with small doses of nitrogenous fertiliser.

b) Application of iron and magnesium to promote synthesis of chlorophyll.

c) Frequent irrigation of the crop.

d) Removal of all yellow leaves and spraying the remaining green leaves with 2, 4, 5 -

trichlorophenoxy acetic acid.

49. The correct sequence of cellular growth stages is: **[4]**

a) Division → elongation → differentiation

b) Division → differentiation → elongation

c) Elongation → differentiation → division

d) Differentiation → division → elongation

50. In which of the following algal classes the starch and oil are present? **[4]**

a) Rhodophyceae

b) Xanthophyceae

c) Chlorophyceae

d) Phaeophyceae

JUPITER ACADEMY

ZOOLOGY MODEL PAPER4

NEET-UG - Biology

Time Allowed: 1 hour **Maximum Marks: 180**

General Instructions:

- For each correct response, the candidate will get 4 marks.
- For each incorrect response, one mark will be deducted from the total scores.

ZOOLOGY (Section-A)

1. Which animal is called as living fossil? **[4]**

   a) Flying fish b) Coelocantha

   c) Dog fish d) Dodo

2. Choose the wrong statement/s for the symmetry of animals. **[4]**

   i. Sponges are mostly asymmetrical

   ii. When any plane passing through the central axis of the body divides the organism into two identical halves, it is called radial symmetry.

   iii. Coelenterates, ctenophores and echinoderms have bilateral symmetry.

   iv. Animals like annelids, arthropods, etc., have radial symmetry.

   v. The body can be divided into identical left and right halves in only one plane, exhibit bilateral symmetry.

   a) (iii) and (iv) b) (iii), (iv) and (v)

   c) (ii), (iv) and (v) d) (i), (ii), (iii) and (iv)

3. How many statements are correct for basis of classification of animals? **[4]**

   i. An undifferentiated layer, mesogloea, is present in between the ectoderm and the endoderm in triploblastic animals.

   ii. Annelids, molluscs, arthropods, echinoderms, hemichordates and chordates are coelomates.

   iii. Aschelminthes are called pseudocoelomates.

   iv. The animals in which the body cavity is absent are called acoelomates.

   v. Platyhelminthes to chordates are called diploblastic animals.

   a) Two b) Four

   c) Three d) One

4. In cockroach, mouth-part consists of a labrum, a pair of mandibles, a pair of maxillae and a labium. Labrum and labium act as: **[4]**

   a) Upper and lower jaws respectively b) Upper and lower lips respectively

   c) Lower and upper jaws respectively d) Lower and upper lips respectively

5. Frogs differ from humans in possessing: **[4]**

   a) Hepatic portal system b) Thyroid

c) Nucleated RBCs

d) Paired cerebral hemispheres

6. Partial pressures of carbon dioxide at different parts involved in diffusion in comparison to those in atmosphere represented in given table, match the entities in Column I with their character in Column II regarding CO_2 pressure: **[4]**

Column I	Column II (pressure -in mm Hg)
(A) Atmospheric gas	(i) 95
(B) Alveoli	(ii) 40
(C) Blood (Deoxygenated)	(iii) 45
(D) Blood (Oxygenated)	(iv) 159
(E) Tissue	(v) 0.3

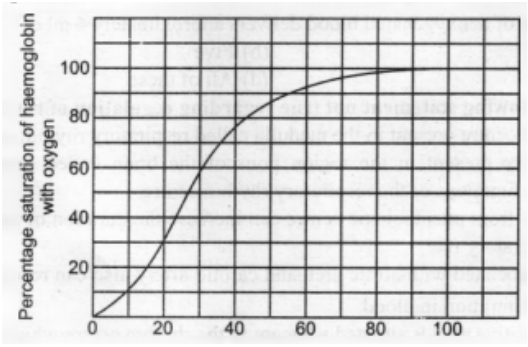
a) (A)-(i), (B)-(v), (C)-(iii), (D)-(iv), (E)-(ii)

b) (A)-(v), (B)-(iv), (C)-(iii), (D)-(ii), (E)-(i)

c) (A)-(v), (B)-(ii), (C)-(iii), (D)-(ii), (E)-(iii)

d) (A)-(v), (B)-(ii), (C)-(i), (D)-(iv), (E)-(iii)

7. Given graph represents: **[4]**



a) CO_2 ,O_2 dissociation curve

b) Oxygen dissociation curve

c) CO_2 dissociation curve

d) Myoglobin dissociation curve

8. Match column I with Column II and choose correct option : **[4]**

Column I	Column II
(A) Insects	(i) Gills
(B) Pheerentima	(ii) Lungs
(C) Mollusca	(iii) Skin
(D) Fishes	(iv) Tracheal tubes
(E) Amphibian	(v) Moist cuticle

a)

(i)	(ii)	(iii)	(iv)	(v)
(D)	(E)	(E)	(A)	(B)

b)

(i)	(ii)	(iii)	(iv)	(v)
(A)	(D)	(C)	(B)	(E)

c)

(i)	(ii)	(iii)	(iv)	(v)
(B)	(C)	(B)	(A)	(E)

d)

(i)	(ii)	(iii)	(iv)	(v)
(D)	(C)	(A)	(B)	(E)

9. Intercostal muscles are found in **[4]**

a) ribs
b) pelvic cavity
c) lungs
d) space between first-two fingers

10. Following is the correct order of diffusion rate of oxygen, carbon dioxide and nitrogen from lungs to blood through the respiratory membrane: **[4]**

a) $O_2 > N_2 > CO_2$
b) $O_2 > N_2 > CO_2$
c) $O_2 > CO_2 > N_2$
d) $CO_2 > O_2 > N_2$

11. Which structure is related with secretion of milk in mammary glands? **[4]**

a) Mammary tubules
b) Alveoli
c) Mammary ampulla
d) Mammary duct

12. Eye lens is formed from: **[4]**

a) Mesoderm
b) Endoderm
c) Ectoderm
d) Ecoderm and mesoderm

13. The second polar body is released **[4]**

a) after ovulation.
b) after fertilisation.
c) before ovulation.
d) after the entry of sperm.

14. Select the sexually transmitted disease which is also transmitted through sharing of injection needles and surgical instruments. **[4]**

a) Hepatitis-B
b) Both (AIDS) and (Hepatitis-B)
c) Syphilis
d) AIDS

15. What is the key of a reproductively healthy life? **[4]**

a) All of these
b) Proper information about safe and hygienic sexual practices
c) Proper information about reproductive organs, adolescence and related changes
d) Proper information about sexually transmitted diseases (STDs), AIDS, etc.

16. The correct match is: **[4]**

Column I	Column II
I. Origin of life	A. Cuvier
II. Origin of species	B. Louis Pasteur
III. Biogenesis	C. Charles Darwin
IV. Catastrophe	D. A.I. Oparin theory

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

17. Neanderthal man was followed by: **[4]**

a) Homo neanderthalensis
b) Cro-magnon man
c) Homo erectus
d) Homo sapiens sapiens

18. The excretory organ in Platyhelminthes is: **[4]**

a) Nephridia b) Green gland

c) Flame cells d) Malpighian tubules

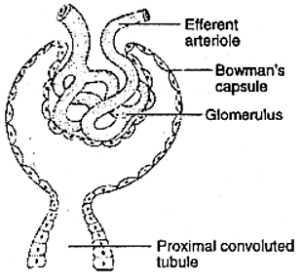
19. Which one of the following option gives the correct categorization of six animals according to the type of nitrogenous wastes (A, B, C) they give out? **[4]**

	A **AMMONOTELIC**	**B** **UREOTELIC**	**C** **URICOTELIC**
A	Frog, Lizards	Aquatic Amphibia, Humans	Cockroach, Pigeon
B	Aquatic Amphibia	Frog, Humans	Pigeon, Lizards, Cockroach
C	Aquatic Amphibia	Cockroach, Humans	Frog, Pigeon, Lizards
D	Pigeon, Humans	Aquatic Amphibia, Lizards	Cockroach, Frog

a) D b) A

c) B d) C

20. Select option which correctly identifies given figure and gives their characteristics and /or functions? **[4]**



a) All of the these b) Malpighian corpuscle-Ultra filtration

c) Malpighian body-Filtration of blood d) Renal corpuscle-Glomerular filtration

21. The functional unit of contractile system in striated muscle is **[4]**

a) myofibril b) sarcomere

c) Z-band d) cross bridges

22. Which is the largest bone in the middle ear? **[4]**

a) Stapes b) Incus

c) Cochlea d) Malleus

23. The opening at the base of the skull for the spinal cord is called: **[4]**

a) Foramen of Monro b) Obturator foramen

c) Foramen of Magendie d) Foramen Magnum

24. Which of the following is not a function of sympathetic system? **[4]**

a) Contraction of blood vessels b) Contraction of urinary bladder

c) Dilation of pupil d) distend of pupil

25. Which of the following structure or regions is incorrectly paired with its function? **[4]**

a) Corpus callosum: Band of fibres connecting left and right cerebral hemispheres.

b) Medulla oblongata: Controls respiration and cardiovascular reflaxes.

c) Limbic system: Consists of fibre tracts that interconnect different regions of brain: Controls movement.

d) Hypothalamus: Production of releasing hormones and regulation of temperature, hunger, and thrust.

26. The resting potential occurs because **[4]**

a) of the different concentrations of ions across the cell.

b) the action potential causes axoplasmic transport back towards the cell body.

c) of reduced energy production by mitochondria.

d) the action potential depletes transmitter substance.

27. The secretion of glucagon causes: **[4]**

a) Decrease in blood glucose

b) Decrease in plasma Ca^{++}

c) Increase in liver glycogen

d) Increase in blood glucose

28. Name a peptide hormone that acts mainly on hepatocytes, adipocytes and enhances cellular glucose uptake and utilization. **[4]**

a) Secretin

b) Insulin

c) Glucagon

d) Gastrin

29. Pacemaker of the heart is situated: **[4]**

a) On intra-auricular septum

b) On inter-venticular septum

c) In the right upper corner of atrium

d) In wall of left atrium close to the opening of pulmonary veins

30. Read the following statements and choose the correct option: **[4]**

Statement 1: Atria receive blood from all parts of the body which subsequently flows to ventricles.

Statement 2: Action potential generated at sino-atrial node passes from atria to ventricles.

a) Action mentioned in Statement 2 is dependent on action mentioned in Statement 1.

b) Action mentioned in Statement 1 is dependent on action mentioned in Statement 2.

c) Action mentioned in Statements 1 and 2 are independent of each other.

d) Action mentioned in Statements 1 and 2 are synchronous.

31. Heart beat is initiated by: **[4]**

a) Purkinje fibres

b) Papillary muscles

c) SA node

d) AV node

32. Which statement about restriction enzymes is incorrect? **[4]**

i. Restriction enzymes are exonucleases rather than endonucleases.

ii. Some restriction enzymes cut the two DNA strands at slightly different points within their recognition site to make a **sticky** end.

iii. Restriction enzymes cut DNA at specific sequence called recognition sites.

iv. A restriction enzyme always cut DNA to leave the same sequence at the ends.

a) Statement (iii) is incorrect.
b) Statement (ii) is incorrect.
c) Statement (i) is incorrect.
d) Statement (iv) is incorrect.

33. DNA fragments generated by the restriction endonucleases in a chemical reaction can be separated by: **[4]**

a) Centrifugation
b) Electrophoresis
c) Restriction mapping
d) Polymerase chain reaction

34. Besides forming a substrate for laboratory culture, agar is used in **[4]**

a) Photography
b) Solar energy
c) Dairy and food industries, metal painting and metallurgy etc.
d) Turbine

35. Which of the following transgenic animals are used in testing safety of polio vaccine before they are used on human? **[4]**

a) Transgenic cow
b) Transgenic mice
c) Transgenic sheep
d) Transgenic monkey

ZOOLOGY (Section-B)

Attempt any 10 questions

36. Match the entities in Column I with their character in Column II. **[4]**

Column I	**Column II**
(a) Hyla	(i) Turtle
(b) Ichthyophis	(ii) Tortoise
(c) Chelone	(iii) Krait
(d) Testudo	(iv) Tree frog
(e) Bangarus	(v) Limbless amphibia

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

37. What is the function of the atrioventricular (AV) valve in the frog's heart, and where is it located? **[4]**

a) It regulates the flow of blood between the heart and the lungs.
b) It prevents the backflow of blood from the ventricle into the atria and is located between the atria.
c) The AV valve ensures unidirectional blood flow in the systemic circulation.
d) It is responsible for separating oxygenated and deoxygenated blood in the ventricle.

38. Which one of the following animals has two separate circulatory pathways? **[4]**

a) Lizard
b) Frog
c) Whale
d) Shark

39. Identify the correct statement with reference to transport of respiratory gases by blood? **[4]**

a) Only oxygen is transported by blood.
b) Only carbon dioxide is transported by

blood.

c) Hemoglobin is necessary for transport of carbon dioxide and carbonic anhydrase for transport of oxygen.

d) Haemoglobin is necessary for transport of oxygen and carbonic anhydrase for transport of carbon dioxide.

40. The cessation of menstrual cycle at the age of 50 is called **[4]**

a) ovulation

b) Menarche

c) menses

d) Menopause

41. During which of the following weeks of intrauterine life the amniotic fluid is taken out with the help of a surgical needle and separation of the embryo cells present in this fluid is done for amniocentesis: **[4]**

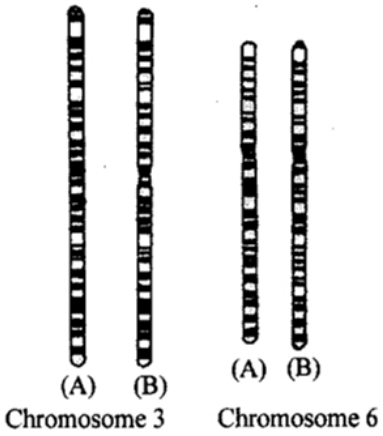
a) 12 weeks

b) 15 weeks

c) 24 weeks

d) 5 weeks

42. The given image is the diagrammatic representation of banding pattern in chromosomes 3 and 6 of man (A) and chimpanzee (B). The result shows DNA of man is very closely related to that of apes. This study provides which type of evidence for evolution? **[4]**



a) Evidences from biogeographic distribution

b) Palaeontological evidences

c) Evidences from comparative morphology and anatomy

d) Molecular evidences

43. Protonephridia are excretory organs of: **[4]**

a) Prawn

b) Planaria

c) Silver Fish

d) Hydra

44. Which of the following statements about the molecular arrangement of actin and myosin in myofibrils is/are incorrect? **[4]**

i. Each actin (thin filament) is made of 2F (filamentous) actins.
ii. F-actin is the polymer of G (globular) actin.
iii. 2F-actins are twisted into a helix.
iv. Two strands of tropomyosin (protein) lie in the grooves of F-actin.
v. Troponin molecules (complex proteins) are distributed at regular intervals on the tropomyosin.
vi. Troponin forms the head of the myosin molecule.
vii. The myosin is a polymerised protein.

a) (i), (iii), and (vii)

b) Only (vi)

c) Only (iii)
d) (ii), (iv), and (v)

45. Which of the following is responsible to control the size of pupil? **[4]**

a) Ciliary muscles
b) Cornea
c) Iris muscles
d) Suspensory ligaments

46. Excess of which hormone causes exophthalamic goitre? **[4]**

a) Progesterone
b) Insulin
c) Thyroxine
d) Glucagon

47. Hormone from adenohypophysis that stimulates the gonads in male and female are called: **[4]**

a) FSH
b) LTH
c) Gonadotropin
d) PL

48. Blood circulation that starts in capillaries and ends in capillaries is called: **[4]**

a) Portal circulation
b) systemic circulation
c) Hepatic circulation
d) Cardiac circulation

49. Which of the following contains the key tools of recombinant DNA technology? **[4]**

i. Restriction endonucleases, ligases, vectors
ii. Ligases, host organism, polymerase enzymes
iii. Vectors, Taq polymerase, primers
iv. Restriction exonucleases, ligases, primers, bioreactors

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

50. Bacillus thuringiensis (fit) strains have been used for designing novel: **[4]**

a) Bio-fertilizers
b) Bio-insecticidal plants
c) Bio-mineralization processes
d) Bio-metallurgical techniques