Techior Solutions Pvt. Ltd.

NEET Mock Test - 1

Total Time: 3 Hr : 20 Mins | Total Marks: 720.0

Physics

Section A

MCQ Single Correct. Attempt all 35 Questions.

1) If two balls are projeted at angles of $45°$ and $60°$ and the maximum heights reached are same, what is the ratio of initial velocities? **4.0**

A) $2:3$

B) $3:2$

C) $\sqrt{2}:\sqrt{3}$

D) $\sqrt{3}:\sqrt{2}$

2) At constant volume, temperature of a cylinder is increased then: **4.0**

A) Collision on walls will be less

B) Collision frequency will increase

C) Collision will be in straight line

D) Collision will not change

3) A particle is executing SHM along a straight line. Its velocities at distances x_1 and x_2 from the mean position are v_1 and v_2, respectively. Its time period is: **4.0**

A) $2\pi\sqrt{\frac{(x_1^2+x_2^2)}{(v_1^2+v_2^2)}}$

B) $2\pi\sqrt{\frac{(x_2^2-x_1^2)}{(v_1^2+v_2^2)}}$

C) $2\pi\sqrt{\frac{(x_2^2-x_1^2)}{(v_1^2-v_2^2)}}$

D) $2\pi\sqrt{\frac{(v_1^2-v_2^2)}{(x_1^2-x_2^2)}}$

4) The wet-ability of a surface by a liquid depends primarily on: **4.0**

A) Density

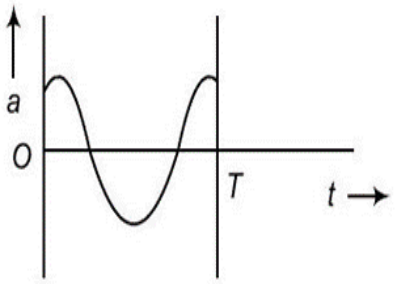
B) Angle of contact between surface and liquid

C) Viscosity

D) Surface tension

5) The oscillation of a body on a smooth horizontal surface is represented by the equation $X = A\cos(\omega t)$, where $X =$ displacement at time and t, and $\omega =$ frequency of oscillation. Which one of the following graph shows correctly variation of ' a ' with ' t '? **4.0**

A)



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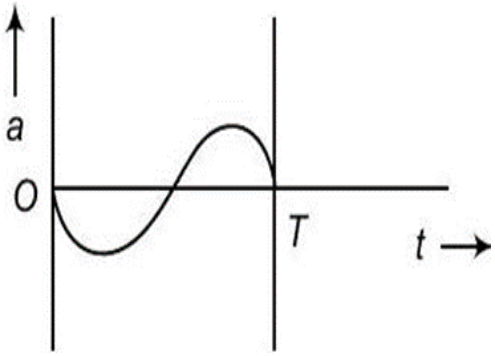

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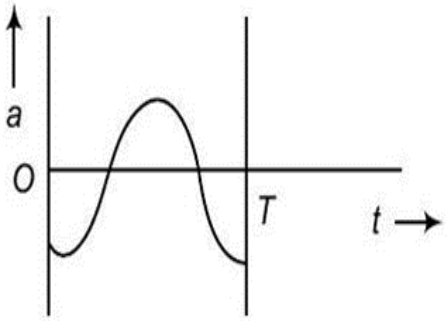

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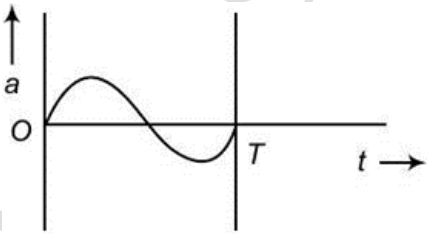


6) Through which character we can distinguish the light waves from sound waves: **4.0**

A) Interference
B) Refraction
C) Polarization
D) Reflection

7) A man is sitting with folded hands on a revolving table. Suddenly, he stretches his arms, Angular speed of the table would: **4.0**

A) Increase

B) Decrease

C) Remain the same

D) Nothing can be said

8) A light string passing over a smooth light pulley connects two blocks of masses m_1 and m_2 (vertically). If the acceleration of system is $\frac{g}{8}$, then the ratio of masses is: **4.0**

A) 8 : 1

B) 9 : 7

C) 4 : 3

D) 5 : 3

9) The acceleration due to gravity on planet A is 9 times the acceleration due to gravity on planet B. A man jumps to a height of 2 m on the surface of planet A . What is the height of the same jump on planet ? **4.0**

A) 18 m

B) 6 m

C) $\frac{2}{3}$ m

D) 219 m

10) In a plane electromagnetic wave, the electric field oscillates sinusoidally at a frequency of 2×10^{10} Hz with amplitude of $48 \mathrm{Vm}^{-1}$. The wavelength of wave is **4.0**

A) 24×10^{-10} m

B) 24×10^{8} m

C) 1.5×10^{8} m

D) 1.5×10^{-2} m

11) Voltage and current in AC circuit are given by $\mathrm{V} = 10 \sin\left(50\pi t - \frac{\pi}{6}\right)$ and $\mathrm{I} = 4\sin\left(50\pi t + \frac{\pi}{6}\right)$ **4.0**

A) Voltage leads the current by 60°

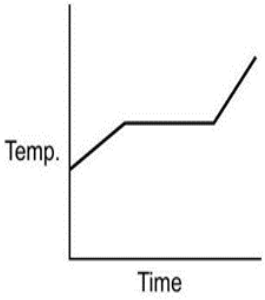
B) Voltage leads the current by 30°

C) Current leads the voltage by 30°

D) Current leads the voltage by 60°

12) Liquid oxygen at 50 K is heated to 300 K at constant pressure of 1 atm . The rate of heating is constant. Which one of the following graphs represents the variation of temperature with time? **4.0**

A)



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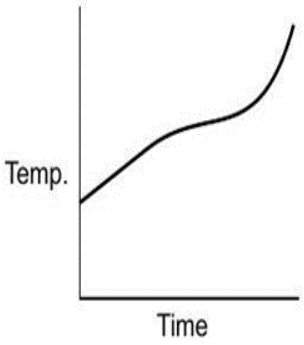

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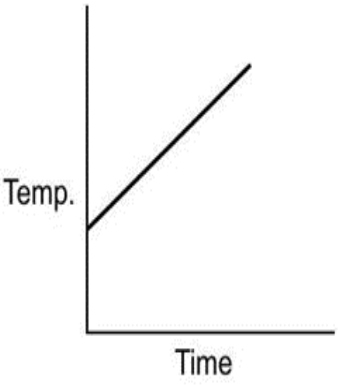
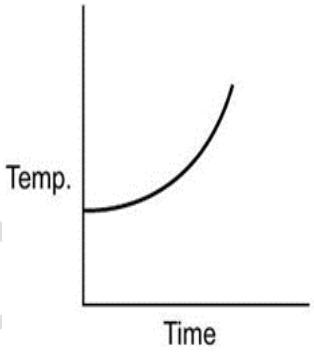


D)



13) A semi-conducting device is connected in a series circuit with a resistance. A current is found to pass through the circuit. If the polarity of the battery is reversed, the current drops to almost zero. The device may be: **4.0**

A) A $p-n$ junction

B) An intrinsic semi-conductor

C) A p-type semi-conductor

D) An n-type semiconductor

14) A parallel beam of monochromatic light of wavelength 5000Å is incident normally on a single narrow slit of width 0.001 mm . The light is focused by a convex lens on a screen placed on the focal plane. The first minima will be formed for the angle of diffraction equal to **4.0**

A) $0°$
B) $15°$
C) $30°$
D) $60°$

15) The magnetic flux across a loop of resistance 10Ω is given by $10t^2 - 8t + 6$ Wb. How much current is induced in the loop after 2 s ? **4.0**

A) 3.2 A
B) 2.2 A
C) 4.2 A
D) 1.2 A

16) Statement I: A car is moving in a horizontal circular plane with varying speed, then the net frictional force is neither pointing towards the radial direction nor along the tangential direction. **4.0**
Statement II: Components of the frictional force are providing the necessary tangential and centripetal acceleration, in the above situation.

A) Statement I is true, Statement II is true and Statement II is the correct explanation of Statement I
B) Statement I is true, Statement II is true, but Statement II is not the correct explanation of Statement I
C) Statement I is true, Statement II is false
D) Statement I is false, Statement II is true

17) A current of 4×10^{-3} A is flowing in a long straight conductor. The value of line integral of magnetic field around the closed path enclosing the straight conductor will be **4.0**

A) $1.6\pi \times 10^{-9}\text{Wbm}^{-2}$
B) $1.6 \times 10^{-9}\text{Wbm}^{-2}$
C) $1.6 \times 10^{-9}\text{Wbm}^{-2}$
D) $1.6\pi \times 10^{-7}\text{Wbm}^{-2}$

18) A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm . The main scale reading is 5 mm and the 25th division of the circular scale coincides with the reference level of the main scale. If screw gauge has a zero error of -0.004 cm , the correct diameter of the ball is: **4.0**

A) 0.521 cm
B) 0.529 cm
C) 0.053 cm
D) 0.525 cm

19) A person of mass 60 kg is inside a lift of mass 940 kg and presses the button on control panel. The lift starts moving upwards with acceleration $1.0\ \text{ms}^{-2}$. If $g = 10\ \text{ms}^{-2}$, the tension in the supporting cable is: **4.0**

A) 8600 N
B) 9680 N
C) 11000 N
D) 1200 N

20) An alternating voltage source is connected in series with a resistor R and an inductor L . If the potential drop across resistor is 120 V and across inductor is 50 V then the supply voltage is **4.0**

A) 170 V
B) 70 V
C) 130 V
D) 110 V

21) The speed of a homogenous solid sphere after rolling down an inclined plane of vertical height h from rest without sliding is: **4.0**

A) $\sqrt{10gh/7}$
B) $\sqrt{gh}$
C) $\sqrt{6gh/5}$
D) $\sqrt{4gh/3}$

22) A charge of $40\mu C$ is given to a capacitor having capacitance $C = 10\mu F$. The stored energy in ergs is: **4.0**

A) 80×10^{-6}
B) 800
C) 80
D) 8000

23) Which of the following statements is true about the indicator diagram of adiabatic and isothermal processes? **4.0**

A) The slope of isothermal is more than that of adiabatic
B) The slope of adiabatic is more than that of isothermal
C) Both are parallel straight lines
D) Both are parallel curves

24) In which of the following cases the potential energy is defined **4.0**

A) non-conservative forces only
B) conservative forces only
C) both conservative and non-conservative forces
D) none of these

25) A certain metallic surface is illuminated with monochromatic light of wavelength, λ. The stopping potential for photoelectric current for this light is $3\ V_0$. If the same surface is illuminated with light of wavelength 2λ, the stopping potential is V_0. The threshold wavelength for this surface for photoelectric effect is: **4.0**

A) $\lambda/4$
B) $\lambda/6$
C) 6λ
D) 4λ

26) Given below are two statements: **4.0**

Statement I: The presence of a negatively charged metal bob oscillating above a positively charged metal plate will affect the period of the pendulum.

Statement II: The interaction between the opposite charges generates an attractive electric force that modifies the effective acceleration experienced by the pendulum bob, thereby altering its period.
Choose the correct answer from the options given below:

A) Statement I is true, Statement II is true and Statement II is the correct explanation of Statement I

B) Statement I is true, Statement II is true, but Statement II is not the correct explanation of Statement I

C) Statement I is true, Statement II is false

D) Statement I is false, Statement II is true

27) A particle of mass m is moving with a uniform velocity v_1. It is given an impulse such that its velocity becomes v_2. The impulse is equal to: **4.0**

A) $m[|v_2| - |v_1|]$

B) $\frac{1}{2}[v_2^2 - v_1^2]$

C) $m[v_2 + v_1]$

D) $m[v_2 - v_1]$

28) A specimen of silicon is to be made p-type semiconductor. For this one atom of indium, on an average, is doped in 5×10^7 silicon atoms. If the number density of silicon is 5×10^{28} atoms $/\mathrm{m}^2$, then the number of acceptor atoms per cm^3 will be: **4.0**

A) 2.5×10^{30}

B) 1.0×10^{13}

C) 1.0×10^{15}

D) 2.5×10^{36}

29) A set of ' n ' equal resistors, of value ' R ' each, are connected in series to a battery of emf ' E ' and internal resistance ' R '. The current drawn is I. Now, the ' n ' resistors are connected in parallel to the same battery. Then the current drawn from battery becomes 10I. The value of ' n ' is: **4.0**

A) 20

B) 11

C) 10

D) 9

30) Water with a mass of 2.0 kg is held at constant volume in a container while 10.0 kJ of energy is slowly added by a flame. The container is not well insulated, and as a result 2.0 kJ of energy leaks out to the surroundings. What is the temperature of water? **4.0**

A) $0.28^\circ\mathrm{C}$

B) $27^\circ\mathrm{C}$

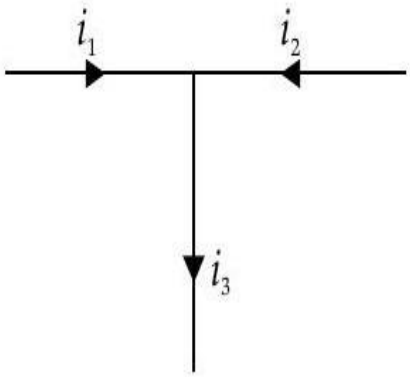
C) $0.96^\circ\mathrm{C}$

D) $1.27^\circ\mathrm{C}$

31) Three sound waves of equal amplitudes have frequencies ($n-1), n, (n+1)$. They superimpose to give beats. The number of beats produced per second will be: **4.0**

A) 1
B) 4
C) 3
D) 2

32) If $i_1 = 3\sin \omega t$ and $i_2 = 4\cos \omega t$, then i_3 is: **4.0**



A) $5\sin(\omega t + 53°)$
B) $5\sin(\omega t + 37°)$
C) $5\sin(\omega t + 45°)$
D) $5\cos(\omega t + 53°)$

33) A long wire carrying a steady current is bent into a circular loop of one turn. The magnetic field at the centre of the loop is B. It is then bent into a circular coil of n turns. The magnetic field at the centre of this coil of n turns will be: **4.0**

A) n B
B) n^2B
C) $2n$ B
D) $2n^2$ B

34) A sound of wavelength λ travelling in a medium with a speed of v m/s enters into another medium where its speed is $2v$ m/s. Wavelength of the sound wave in the second medium is **4.0**

A) λ
B) $\lambda/2$
C) 2λ
D) 4λ

35) A charged pendulum bob is oscillating in a region influenced by the gravitational and electrostatic field. The two fields are anti parallel to each other. The charge on the bob is negative. If the electric field is switched off the time period of small oscillations of the pendulum will: **4.0**

A) Increase
B) Decrease
C) Remain unchanged
D) Depends on the magnitudes of the field

Section B

MCQ Single Correct. Attempt any 10 out of 15 Questions.

36) How many revolutions does an electron makes in the first Bohr orbit in one second? **4.0**

A) 1.33×10^{16}

B) 6.57×10^{16}

C) 1.54×10^{16}

D) 6.57×10^{15}

37) If the dimensions of a physical quantity are given by $[M^a L^b T^c]$, then the physical quantity will be: **4.0**

A) Force if, $a = 0, b = -1, c = -2$

B) Pressure if, $a = 1, b = -1, c = -2$

C) Velocity if, $a = 1, b = 0, c = -1$

D) Acceleration if, $a = 1, b = 1, c = -2$

38) The isothermal elasticity of a gas is equal to: **4.0**

A) Density

B) Volume

C) Pressure

D) Specific heat

39) Velocity of light in glass whose refractive index with respect to air is 1.5 is 2×10^8 m/s. Also in certain unknown liquid the velocity of light is found to be 2.5×10^8 m/s. The refractive index of the liquid with respect to air is **4.0**

A) 0.64

B) 0.80

C) 1.20

D) 1.44

40) A car moving at a speed of 72 km/hr can be stopped in a distance of 40 m after brakes are pressed. If the same car is moving at a speed of 144 km/hr then after how much distance it will stop after braking? **4.0**

A) 80 m

B) 160 m

C) 200 m

D) 240 m

41) A small object of uniform density rolls up a curved surface with an initial velocity " v ". It reaches up to a maximum height of $3v^2/4g$ with respect to the initial position. The object is: **4.0**

A) Solid sphere

B) Hollow sphere

C) Disc

D) Ring

42) Workdone in increasing the size of a soap bubble from radius of 3 cm to 5 cm is nearly (surface tension of soap solution $= 0.03\text{Nm}^{-1}$) **4.0**

A) 0.2π Mj

B) 2π mJ

C) 0.4π mJ

D) 4π mJ

43) The acceleration of electron in the first orbit of hydrogen atom is **4.0**

A) $\frac{4\pi^2 m}{h^3}$

B) $\frac{h^2}{4\pi^2 mr}$

C) $\frac{h^2}{4\pi^2 m^2 r^3}$

D) $\frac{m^2 h^2}{4\pi^2 r^3}$

44) In a p-n junction diode, change in temperature due to heating: **4.0**

A) Does not affect resistance of $p-n$ junction

B) Affects only forward resistance

C) Affects only reverse resistance

D) Affects the overall V-I characteristics of P-N junction

45) The electric potential at a point on the axis of an electric dipole depends on the distance r of the point from the dipole as: **4.0**

A) $\propto 1/r$

B) $\propto 1/r^2$

C) $\propto 1/r^2$

D) $\propto 1/r^3$

46) A plane polarised light coming out of a polarizer with intensity I_0 enters an analyser kept at an angle of 45° with the polarizer. What will be the intensity of the light coming out of the analyser? **4.0**

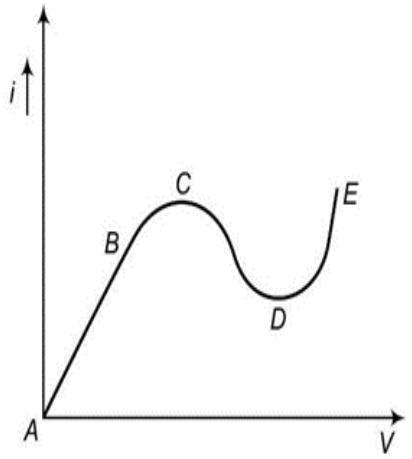
A) I_0

B) $\frac{I_0}{2}$

C) $\frac{I_0}{4}$

D) Zero

47) From the graph between current i and voltage V shown below, identify the portion corresponding to negative resistance: **4.0**



A) DE
B) CD
C) BC
D) AB

48) A polarizer is used to **4.0**

A) reduce intensity of light
B) produce polarized light
C) increase intensity of light
D) produce unpolarized light

49) A car of mass 1600 kg negotiates a banked curve of radius 160 m on a frictionless road. If the banking angle is $45°$, the speed of the car is: **4.0**

A) 45 m/s
B) 40 m/s
C) 20 m/s
D) 80 m/s

50) A physical quantity of the dimension of length that can be formed out of c, G and $\frac{e^2}{4\pi\varepsilon_0}$ is: [c is velocity of light, G is universal constant of gravitation, e is charge] **4.0**

A) $e^2\left[G\frac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$
B) $\frac{1}{c^2}\left[\frac{e^2}{G4\pi\varepsilon_0}\right]^{1/2}$
C) $\frac{1}{c}G\frac{e^2}{4\pi\varepsilon_0}$
D) $\frac{1}{c^2}\left[G\frac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$

Chemistry

Section A

MCQ Single Correct. Attempt all 35 Questions.

1) Which of the following is an ideal solution? **4.0**

A) Ethanol + water
B) Ethanol + benzene
C) Nitric acid + water
D) Benzene + toluene

2) Consider the following statements. **4.0**

(1) XeF_4 is colourless crystalline solid and undergoes sublimation.

(2) $XeOF_4$ is colourless volatile liquid.

(3) XeO_3 is colourless explosive solid.

The correct statements are:

A) (1) and (2) only
B) (2) and (3) only
C) (1) and (3) only
D) (1), (2) and (3)

3) Given below are two statements **4.0**

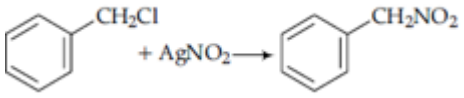
Statement I: The bond angle in BCl_3 is $120°$.
Statement II: The geometry of BCl_3 is trigonal.
Choose the correct answer from the options given below:

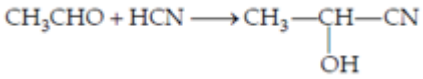
A) Statement I is incorrect but Statement II is true
B) Both statement I and Statement II are true
C) Both Statement I and Statement II are false
D) Statement I is correct but statement II is false

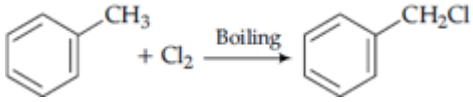
4) The correct order of increasing bond length of $C-H$, $C-O$, $C-C$ and $C=C$ is: **4.0**

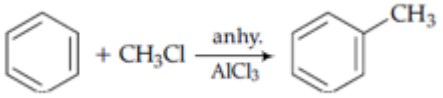
A) $C-C < C=C < C-O < C-H$
B) $C-O < C-H < C-C < C=C$
C) $C-H < C-O < C-C < C=C$
D) $C-H < C=C < C-O < C-C$

5) Which one of the following is a free-radical substitution reaction? **4.0**

A) 

B) 

C) 

D) 

6) What is the activation energy for a reaction if its rate doubles when the temperature is raised from $20°C$ to $35°C$? **4.0**
($R = 8.314\ J\ mol^{-1}\ K^{-1}$)

A) $342\ kJ\ mol^{-1}$
B) $269\ kJ\ mol^{-1}$
C) $34.7\ kJ\ mol^{-1}$
D) $15.1\ kJ\ mol^{-1}$

7) The numbers of mole of phenylhydrazine needed to form fructosazone when react with fructose is: **4.0**

A) 1
B) 2
C) 3
D) 4

8) Indicate the coordination number and oxidation state of the complex $[Ni(en)_2(C_2O_4)]NO_2$. **4.0**

A) +1
B) +2
C) -2
D) +3

9) At $25°C$, the dissociation constant of a base, BOH is 1.0×10^{-12}. The concentration of hydroxyl ions in 0.01 M aqueous solution of the base would be: **4.0**

A) $2.0 \times 10^{-6}\ mol\ L^{-1}$
B) $1.0 \times 10^{-5}\ mol\ L^{-1}$
C) $1.0 \times 10^{-6}\ mol\ L^{-1}$
D) $1.0 \times 10^{-7}\ mol\ L^{-1}$

10) Given below are two statements: one is labelled as **4.0**

Assertion A and the other is labelled as Reason R:
Assertion A: The reaction of H_2O_2 with hydrogen sulphide is an example of oxidation reaction.
Reasons R: Hydrogen sulphide is basic in nature.
In the light of the above statements, choose the correct answer from the options given below:

A) Both A and R are true and R is NOT the correct explanation of A

B) A is true but R is false

C) A is false but R is true.

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

11) Match list I with List II. **4.0**

List I	List II
(A) Protein	(i) DNA
(B) Nucleic acid	(ii) Polymer of α-amino acids
(C) Polysaccharides	(iii) glucogen
	(iv) maltase

Choose the correct answer from the options given below.

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

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

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

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

12) Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules? **4.0**

A) $Br_2 > I_2 > F_2 > Cl_2$

B) $F_2 > Cl_2 > Br_2 > I_2$

C) $I_2 > Br_2 > Cl_2 > F_2$

D) $Cl_2 > Br_2 > F_2 > I_2$

13) Given below are two statements: one is labelled as **4.0**

Assertion A and the other is labelled as Reason R:
Assertion A: Acetone and ethanol distinguished by 2, 4 DNP test.
Reasons R: Ethanol do not react with 2, 4 DNP
In the light of the above statements, choose the correct answer from the options given below:

A) Both A and R are true and R is NOT the correct explanation of A

B) A is true but R is false

C) A is false but R is true

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

14) Consider the following reaction: **4.0**

$$\text{Ethanol} \xrightarrow{PBr_3} X \xrightarrow{\text{alc. KOH}} Y \xrightarrow[\text{(ii) } H_2O,\ \text{heat}]{\text{(i) } H_2SO_4,\ \text{room temperature}} Z$$

The product Z is:

A) $CH_3CH_2O - CH_2 - CH_3$

B) $CH_3 - CH_2 - O - SO_3H$

C) CH_3CH_2OH

D) $CH_2 = CH_2$

15) The solubility of $BaSO_4$ in water is $2.42 \times 10^{-3} gL^{-1}$ at 298 K . The value of solubility product (K_{sp}) will be [Given molar mass of $BaSO_4 = 233\ g\ mol^{-1}$] **4.0**

A) $1.08 \times 10^{-10}\ mol^2\ L^{-2}$

B) $1.08 \times 10^{-12}\ mol^2\ L^{-2}$

C) $1.08 \times 10^{-14}\ mol^2\ L^{-2}$

D) $1.08 \times 10^{-8}\ mol^2\ L^{-2}$

16) Given below are two statements **4.0**

Statement I: SF_6 exists but SH_6 does not.
Statement II:
$d\pi - p\pi$ bonding cannot take place in SH_6.
Choose the correct answer from the options given below:

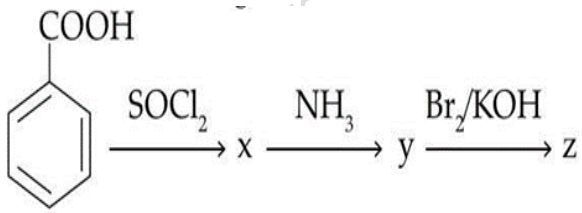
A) Statement I is incorrect but Statement II is true

B) Both statement I and Statement II are true

C) Both Statement I and Statement II are false

D) Statement I is correct but statement II is false

17) Give the IUPAC nomenclature of the final product(z) formed in the following reactions. **4.0**



A) Aniline

B) Chlorobenzene

C) Benzamide

D) Benzoyl chloride

18) A button cell used in watches functions as following: **4.0**

$Zn(s) + Ag_2O(s) + H_2O(l) \rightarrow 2Ag(s) + Zn^{2+}(aq) + 2OH^-(aq)$

If half-cell potentials are:

$\mathbf{Zn}^{2+}(aq) + 2e^- \rightarrow \mathbf{Zn}(s) E^\circ = -0.76\ V$

$Ag_2O(s) + H_2O(l) + 2e^- \rightarrow 2Ag(s) + 2OH^-(aq), E^\circ = 0.34\ V$

The cell potential will be:

A) 1.10 V

B) 0.42 V

C) 0.84 V

D) 1.34 V

19) The efficiency of a fuel cell is given by: **4.0**

A) $\frac{\Delta G}{\Delta S}$

B) $\frac{\Delta G}{\Delta H}$

C) $\frac{\Delta S}{\Delta G}$

D) $\frac{\Delta H}{\Delta G}$

20) Given below are two statements: one is labelled as **4.0**

Assertion A and the other is labelled as Reason R.
Assertion A: The structure of XeF_6 is not symmetrical.
Reasons R: XeF_6 have zero dipole moment.
In the light of the above statements, choose the correct answer from the options given below:

A) Both A and R are true and R is NOT the correct explanation of A

B) A is true but R is false

C) A is false but R is true

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

21) The incorrect statements among the following is: **4.0**

A) Glucose on oxidation with Br_2/H_2O gives gluconic acid

B) The pentaacetate of glucose does not react with hydroxyl amine

C) The six membered cyclic structure of glucose is called furanose structure

D) The two cyclic hemiacetal forms of glucose are anomers of each other

22) Following compounds are given: **4.0**

(i) CH_3CH_2OH (ii) CH_3COCH_3

(iii) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CHOH}}$ (iv) CH_3OH

Which of the above compound(s), on being warmed with iodine solution and NaOH , will give iodoform?

A) (i), (iii) and (iv)

B) Only (ii)

C) (i), (ii) and (iii)

D) (i) and (ii)

23) In H-atom spectrum electron jumps from 5th excited state to 1st excited state then total number of spectral lines, number of lines in Lyman series and Paschen series respectively are: **4.0**

A) 10, 4, 3

B) 15, 0, 4

C) 15, 4, 5

D) 10, 0, 3

24) How many isomers are possible for coordination complex $[Co(NH_3)_5(NO_2)](NO_3)_2$. **4.0**

A) 6

B) 10

C) 4

D) 12

25) The species Ar, K^+ and Ca^{2+} contain the same number of electrons. In which order do their radii increase? **4.0**

A) $Ca^{2+} < K^+ < Ar$

B) $K^+ < Ar < Ca^{2+}$

C) $Ar < K^+ < Ca^{2+}$

D) $Ca^{2+} < Ar < K^+$

26) The value of ΔH and ΔS for the reaction, **4.0**

$C_{(\text{graphite})}(s) + CO_2(g) \rightarrow 2CO(g)$ are 170 kJ and $170 JK^{-1}$, respectively. This reaction will be spontaneous at:

A) 710 K

B) 910 K

C) 1110 K

D) 510 K

27) Aqueous solution of which of the following compounds is the best conductor of electric current? **4.0**

A) Hydrochloric acid, HCl

B) Ammonia, NH_3

C) Fructose, $C_6H_{12}O_6$

D) Acetic acid, $C_2H_4O_2$

28) Equal volumes of four acid solutions having $pH 1,2,3$ and 4 are mixed in a container. The concentration of hydrogen ion in the mixture of **4.0**

A) $4.25 \times 10^{-4} M$

B) $2.78 \times 10^{-2} M$

C) $2.30 \times 10^{-3} M$

D) $1.35 \times 10^{-2} M$

29) A mixture of gases contains H_2 and O_2 gases in the ratio of $1:4(w/w)$. What is the molar ratio of the two gases in the mixture? **4.0**

A) 16 : 1
B) 2 : 1
C) 1 : 4
D) 4 : 1

30) Which of the following is correct with respect to -I effect of the substituents? $[R = \text{alkyl}]$ **4.0**

A) $-NH_2 > -OR > -F$
B) $-NR_2 < -OR < -F$
C) $-NH_2 < -OR < -F$
D) $-NR_2 > -OR > -F$

31) The experimental data for the reaction $2\,A + B_2 \longrightarrow 2AB$ is: **4.0**

Exp.	[A]	[B]	Rate (Ms^{-1})
1.	0.50	0.50	1.6×10^{-4}
2.	0.50	1.00	3.2×10^{-4}
3.	1.00	1.00	3.2×10^{-4}

The rate equation for the above data is:

A) rate $= k[B_2]$
B) rate $= k[B_2]^2$
C) rate $= k[A]^2[B]^2$
D) rate $= k[A]^2[B]$

32) In which of the following options the order of arrangement does not agree with the variation of property indicated against it? **4.0**

A) $I < Br < Cl < F$ (increasing electron gain enthalpy)
B) $Li < Na < K < Rb$ (increasing metallic radius)
C) $Al^{3+} < Mg^{2+} < Na^{+} < F^{-}$ (increasing ionic size)
D) (a) and (c) both

33) The angular momentum of electron in ' d ' orbital is equal to: **4.0**

A) $2\sqrt{3}\,h$
B) h
C) $\sqrt{6}h$
D) $\sqrt{2}h$

34) In which of the following reaction C-C bond formation does not take place? **4.0**

A) Gattermann-Koch reaction

B) Étard reaction

C) Benzoin condensation

D) Swarts reaction

35) If the enthalpy change for transition of liquid water to steam is $30 kJ mol^{-1}$ at $27^{\circ}C$. The entropy change for the process would be: **4.0**

A) $1.0\ J\ mol^{-1}\ K^{-1}$

B) $0.1\ J\ mol^{-1}\ K^{-1}$

C) $100\ J\ mol^{-1}\ K^{-1}$

D) $10\ J\ mol^{-1}\ K^{-1}$

Section B

MCQ Single Correct. Attempt any 10 out of 15 Questions.

36) In which electrophilic substitution reaction slow step is breaking of $C-H$ bond? **4.0**

A) Sulphonation of benzene

B) Nitration of benzene

C) Chlorination of benzene

D) All of these

37) The enthalpy of vaporization of $H_2O(l)$ is xkJ/mol and enthalpy of formation of water vapour ykJ/mol. Enthalpy of formation of $H_2O(l)$. would be **4.0**

A) $(y-x) kJ mol^{-1}$

B) $(x-y) kJ mol^{-1}$

C) $(x+y) kJ mol^{-1}$

D) $(2x-y) kJ mol^{-1}$

38) In which of the following molecules/ions BF_3, NO_2^-, NH_2^- and H_2O, the central atom is sp^2 hybridised? **4.0**

A) NO_2^- and NH_2^-

B) NH_2^- and H_2O

C) NO_2^- and H_2O

D) BF_3 and NO_2^-

39) What is the correct IUPAC name of the following coordination compound. **4.0**

$[Cr(py)_3Cl_3]$

A) Trichlorotripyridinium chromium (III)

B) Tripyridiniumtrichloro chromium (III)

C) Trichlorotripyridine chromium (III)

D) Trichlorotripyridine chromium (II)

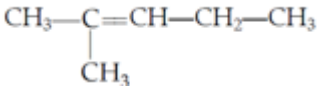
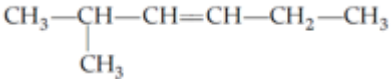
40) A solution has 1 : 4 mole ratio of pentane to hexane. The vapour pressure of the pure hydrocarbons at $20^{\circ}C$ are 440 mm of Hg for pentane and 120 mm of Hg for hexane. The mole fraction of pentane in the vapour phase would be: **4.0**

A) 0.549
B) 0.200
C) 0.786
D) 0.478

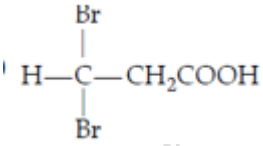
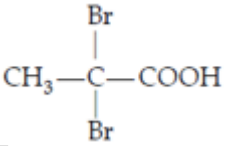
41) In acidic medium, H_2O_2 changes $Cr_2O_7^{2-}$ to CrO_5 which has two ($-O-O-$) bonds. Oxidation state of Cr in CrO_5 is: **4.0**

A) +5
B) +3
C) +6
D) -10

42) Which of the following will not show cis-trans isomerism? **4.0**

A) $CH_3—CH=CH—CH_3$
B) $CH_3—CH_2—CH=CH—CH_2CH_3$
C) 
D) 

43) Propionic acid with Br_2/P yields a dibromo product. Its structure would be: **4.0**

A) $CH_2Br—CHBr—COOH$
B) 
C) $CH_2Br—CH_2—COBr$
D) 

44) Among the following compounds, one that is most reactive towards electrophilic nitration is **4.0**

A) benzoic acid
B) nitrobenzene
C) toluene
D) benzene

45) Given below are two statements: one is labelled as **4.0**

Assertion A and the other is labelled as Reason R:
Assertion A: Gadolinium belongs to 4 f series.
Reasons R: atomic number of Gadolinium is 64.
In the light of the above statements, choose the correct answer from the options given below:

A) Both A and R are true and R is NOT the correct explanation of A

B) A is true but R is false

C) A is false but R is true

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

46) At $25^{\circ}C$ and 730 mm pressure, 380 ml of dry oxygen was collected. If the temperature is constant, what volume will the oxygen occupy at 760 mm pressure? **4.0**

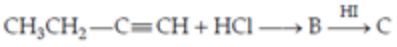
A) 365 ml

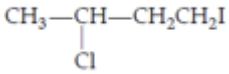
B) 2 ml

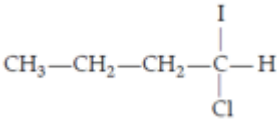
C) 10 ml

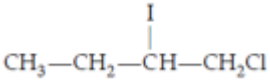
D) 20 ml

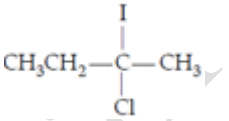
47) Predict the product C obtained in the following reaction of 1-butyne. **4.0**



A) 

B) 

C) 

D) 

48) Which of the following statement(s) is correct? **4.0**

A) $[Fe(CN)_6]^4$is diamagnetic but $[Fe(CN)_6]^{3-}$is paramagnetic

B) Fe^{3+}ions always form tetrahedral complexes

C) In a compound with an octahedral structure, the $d_{xy}$and d_{yz}orbitals of a metal ion should be vacant.

D) The ferric ammonium alum is a complex salt.

49) One mole of Al^{3+} discharged completely by using charge? **4.0**

A) 3 F

B) 1 F

C) 0.3 F

D) 2 F

50) The rate of first-order reaction is at 10 seconds and at 20 seconds after initiation of the reaction. The half-life period of the reaction is: **4.0**

A) 44.1 s

B) 54.1 s

C) 24.1 s

D) 34.1 s

Botany

Section A

MCQ Single Correct. Attempt all 35 Questions.

1) The end products of fermentation is **4.0**

(1) CO_2

(2) Ethanol
(3) Oxygen

(4) Acetaldehyde

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

2) A typical angiosperm anther has 1200 pollen grains. How many pollen mother cells must have been there to produce them? **4.0**

A) 200
B) 400
C) 300
D) 600

3) The osmotic expansion of a cells kept in water is chiefly regulated by: **4.0**

A) Mitochondria
B) Vacuoles
C) Plastids
D) Ribosomes

4) The parasitic fungus on mustard plant is **4.0**

A) Albugo
B) Ustilago
C) Puccinia
D) Colletotrichum

5) Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R. **4.0**
Assertion A: Antibiotics are effective against bacterial infections.

Reason R: Antibiotics disrupt bacterial cell wall synthesis, protein synthesis, or other essential processes, leading to the inhibition of bacterial growth and eventual elimination.
In the light of the above statements, choose the most appropriate answer from the options given below:

A) Both A and R are correct but R is NOT the correct explanation of A

B) A is correct but R is not correct

C) A is not correct but R is correct

D) Both A and R are correct and R is the correct explanation of A

6) Match the following microbes with the Microbes Product: **4.0**

A. Aspergillus niger
i. Lactic acid
B. Acetobacter aceti
ii. Butyric acid
C. Clostridium butylicum
iii. Acetic acid
D. Lactobacillus
iv. Citric acid

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

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

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

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

7) Vascular bundles in monocotyledons are considered closed because: **4.0**

A) Xylem is surrounded all around by phloem

B) A bundle sheath surrounds each bundle

C) Cambium is absent

D) There are no vessels with perforations

8) Which one is not a hot spot of India? **4.0**

A) Western Ghats

B) Aravalli Hills

C) Indo-Burma

D) Himalaya

9) Which of the given part of oxysome is a peripheral membrane protein and contains the site for ATP synthesis? **4.0**

A) Headpiece

B) Base

C) Stalk

D) - part

10) The outermost layer of macromolecules in the prokaryotic cell envelope is **4.0**

A) cell wall

B) cell membrane

C) glycocalyx

D) peptidoglycan

11) Feedstock for biodiesel can primarily be obtained from **4.0**

A) Nymphaea
B) Abelmoschus
C) Triticum
D) Jatropha

12) Chiasmata become clearly visible during stage. **4.0**

A) diplotene
B) metaphase-I
C) anaphase-I
D) pachytene

13) Select the incorrect statement with respect to gymnosperms. **4.0**

A) Gymnosperms are heterosporous
B) The giant red wood tree Sequoia belongs to gymnosperms
C) The pattern of arrangement of reproductive structures of gymnosperms is spores sporangia strobili sporophylls
D) Ginkgo and Pinus belongs to gymnosperms

14) Read the following statements and select the incorrect one. **4.0**

A) Chloroplast has 705 ribosomes
B) Nucleolus is not bound by any membrane
C) RER helps in synthesis of fats and proteins
D) Lysosome contains hydrolytic enzymes

15) Given below are two statements; **4.0**

Statement I: In primary structure of a protein, the left end is represented by the first amino acid and the right end by the last amino acid.

Statement II: In a polysaccharide chain, the right end is called the reducing end and the left end is called the nonreducing end.
Choose the correct answer from the options given below:

A) Statement I is incorrect but Statement II is true
B) Both Statement I and Statement II are true
C) Both Statement I and Statement II are false
D) Statement I is correct but Statement II is false

16) A template strand of DNA has base sequence CATGATTAC. New strand synthesized on it will be : **4.0**

A) GATCAUATG
B) GTACTAACG
C) GAACTAATG
D) GTACTAATG

17) Which type of diversity is shown by Rauwolfia vomitoria in terms of the potency and concentration of reserpine that it produces? **4.0**

A) genetic diversity
B) species diversity
C) ecological diversity
D) biodiversity

18) In which one of the following processes, carbon dioxide is not released? **4.0**

A) Aerobic respiration in animals
B) Alcoholic fermentation
C) Lactate fermentation
D) Aerobic respiration in plants

19) An organic non-protein substance bound to an enzyme and essential for its activity is: **4.0**

A) Coenzyme
B) Apoenzyme
C) Holoenzyme
D) Isoenzyme

20) Which is the basic requirement for any type of ecosystem to function and sustain? **4.0**

A) Constant output of solar energy
B) Constant input of solar energy
C) Organic substances
D) Organic substances dissolved in water

21) Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R. **4.0**
Assertion A: In Bt Cotton, the conversion of Bt toxin present in plant tissue from protoxin to active toxin occurs.
Reason R: This conversion is primarily facilitated by the alkaline pH of the insect gut, allowing the activation of the Bt toxin and enhancing its efficacy against target pests.

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

A) Both A and R are correct but R is NOT the correct explanation of A
B) A is correct but R is not correct
C) A is not correct but R is correct
D) Both A and R are correct and R is the correct explanation of A

22) Specialised epidermal cells surrounding the guard cells are called: **4.0**

A) Lenticels
B) Complimentary cells
C) Subsidiary cells
D) Bulliform cells

23) Which of the following component of phloem is made up of sclerenchymatous cells? **4.0**

A) Companion cells

B) Bast fiber

C) Sieve tubes

D) Xylem fiber

24) Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R. **4.0**

Assertion A: Biofertilizers primarily consist of bacteria.

Reason R: These bacteria, often nitrogen-fixing strains, form symbiotic relationships with plants, enhancing nutrient availability and promoting plant growth.

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

A) Both A and R are correct but R is NOT the correct explanation of A

B) A is correct but R is not correct

C) A is not correct but R is correct

D) Both A and R are correct and R is the correct explanation of A

25) Ovary is half-inferior in the flowers of: **4.0**

A) Cucumber

B) Guava

C) Plum

D) Brinjal

26) When a cross is made between tall plant with round seeds (TtRr) and tall plant with wrinkled seeds (Ttrr), the proportions of phenotype (A) tall and wrinkled (B) dwarf and wrinkled in the offspring could be expected to be: **4.0**

A) (A) (B)

B) (A) (B)

C) (A) (B)

D) (A) (B)

27) Which one of the following organisms is not a eukaryote? **4.0**

A) Paramecium caudatum

B) Escherichia coli

C) Euglena viridis

D) Amoeba proteus

28) Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R. **4.0**

Assertion A: Eukaryotic cells have a cell wall composed of peptidoglycan.

Reason R: This feature distinguishes them from prokaryotic cells, where peptidoglycan is a characteristic component of the cell wall.

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

A) Both A and R are correct but R is NOT the correct explanation of A

B) A is correct but R is not correct

C) A is not correct but R is correct

D) Both A and R are correct and R is the correct explanation of A

29) Given below are two statements: **4.0**

Statement I: The rate of decomposition is controlled by chemical composition of detritus and climatic factors.
Statement II: In a particular climatic condition, decomposition rate is slower if detritus is rich in nitrogen and water-soluble substances like sugars.
Choose the correct answer from the options given below:

A) Statement I is incorrect but Statement II is true

B) Both statement I and Statement II are true

C) Both Statement I and Statement II are false

D) Statement I is correct but statement II is false

30) Saccharomyces cerevisiae is used to produce enzyme **4.0**

A) invertase

B) pectinase

C) lipase

D) cellulase

31) A pair of plants which can prevent both autogamy as well as geitonogamy is: **4.0**

A) Cucurbits and coconut

B) Coconut and papaya

C) Cucurbits and date palm

D) Date palm and papaya

32) The cutting of DNA at specific locations became possible with the discovery of: **4.0**

A) Restriction enzymes

B) Probes

C) Selectable markers

D) Ligases

33) Pteridophytes and Bryophytes differ in having: **4.0**

A) Spermatozoids

B) Conducting system

C) Separate gametophytes

D) Archegonia

34) Escherichia coli bacteria is grown in a medium that contained and after sometime the cells were transferred into a medium containing . A CsCl density gradient centrifugation of the DNA is done after two rounds of replication. How many bands will be observed in the second round? **4.0**

A) One

B) Two

C) Three

D) Four

35) Place the following event of translation in the correct sequence: **4.0**
(i) Binding of met-tRNA to the start codon.
(ii) Covalent bonding between two amino acids.
(iii) Binding of second tRNA.
(iv) Joining of small and large ribosome subunits.

A) iii, iv, i, ii

B) i, iv, iii, ii

C) iv, iii, ii, i

D) ii, iii, iv, i

Section B

MCQ Single Correct. Attempt any 10 out of 15 Questions.

36) Statement I is correct but Statement II is false **4.0**

A) Bacteria that contain a cytoskeleton and ribosomes

B) Archaebacteria that lack any histones resembling those found in eukaryotes but whose DNA is negatively supercoiled

C) Archaebacteria that contain protein homologous to eukaryotic core histones

D) Bacteria whose DNA is relaxed or positively supercoiled but which have a cytoskeleton as well as mitochondria

37) Which one of the following statements is correct about Bryophytes? **4.0**

A) Sporophyte and gametophyte generations are independent

B) Sporophyte is partially dependent upon gametophyte

C) Gametophyte is dependent upon Sporophyte

D) Inconspicuous gametophyte is present

38) Which is less general in characters as compared to genus? **4.0**

A) Family

B) Class

C) Division

D) Species

39) There are three major types of RNAs present in bacteria and each of them has specific functions. **4.0**
(i) m RNA - Provides the template for translation.
(ii) t RNA - Brings polypeptide chain and reads the transcription unit.
(iii) rRNA - Plays structural and catalytic role during translation.
Identify the type(s) of RNA with its incorrect matching of function

A) (i) and (ii)

B) only (i)

C) (ii) and (iii)

D) only (ii)

40) A cell organelle containing hydrolytic enzyme is: **4.0**

A) Mesosome

B) Lysosome

C) Microsome

D) Ribosome

41) What is the genotypic ratio in test cross for a dihybrid cross if two genes are completely linked? **4.0**

A)

B)

C)

D)

42) Given below are two statements: **4.0**

Statement I: Maximum species diversity is associated with tropical rainforest.
Statement II: Only biotic factors affect the magnitude of primary productivity.
Choose the correct answer from the options given below:

A) Statement I is incorrect but Statement II is true

B) Both Statement I and Statement II are true

C) Both Statement I and Statement II are false

D) Statement I is correct but statement II is false

43) How many of the codons listed in the box codes for valine? **4.0**
UUA, CUC, AUU, GUA, UCC, CCU, ACA, GUU

A) 2

B) 3

C) 4

D) 5

44) Plants which produce characteristic pneumatophores and show vivipary belong to: **4.0**

A) Mesophytes

B) Halophytes

C) Psammophytes

D) Hydrophytes

45) Which of the given character of pea plants is seen only in pure lines? **4.0**

A) Round seeds

B) Yellow pods

C) Full Pods

D) Violet flowers

46) Swiss cheese is ripened with the help of bacterium: **4.0**

A) Penicillium roqueforti

B) Penicillium camembertii

C) Lactobacillus

D) Propionibacterium sharmanii

47) Read the statements given below and fill the blanks with correct option for ' X ' and ' '. **4.0**
(I) During the course of evolution, vascular plants first originated in ' ' '_period.
(II)Herbaceous lycopods and arborescent lycopods evolved from Zosterophyllum of era.

A) 'X' - Devonian, 'Y' - Palaeozoic

B) ' ' - Silurian, ' ' - Palaeozoic

C) ' ' - Permian, ' ' - Mesozoic

D) 'X' - Cretaceous, ' - Cenozoic

48) In the DNA of an organism a total number of 5386 nucleotides were present. The proportion of different bases were: Adenine ; Guanine ; Cytosine , Thymine . Considering the Chargaff's rule it can be concluded that: **4.0**

A) It is a single stranded linear RNA

B) It is single stranded linear DNA

C) It is a double stranded linear DNA

D) It is a double stranded circular DNA

49) PGA as the first carbon dioxide fixation product was discovered in photosynthesis of **4.0**

A) Gymnosperm

B) Angiosperm

C) Alga

D) Bryophyte

50) Which of the following pairs is incorrectly matched? **4.0**
(i) Gregor Johann Mendel - Father of genetics
(ii) Reginald-Punnett square
(iii) Walter Sutton and de Vries-Chromosomal theory of inheritance
(iv) Von Tschermak- Linkage in Drosophila

A) (i) and (ii)

B) Both (i) and (iii)

C) Only (ii)

D) Both (iii) and (iv)

Zoology

Section A

MCQ Single Correct. Attempt all 35 Questions.

1) Which of the following is a non-medicated IUD? **4.0**

- **A)** Lippe's loop
- **B)** Multiload - 375
- **C)** LNG - 20
- **D)** Progestasert

2) Given below are two statements: **4.0**

Statement I: The cardiac notch is a concave impression on the left lung that accommodates the apex of the heart.

Statement II: It is located near the mediastinal surface of the left lung and is a significant anatomical feature for understanding the relationship between the heart and the lungs in human anatomy.
Choose the correct answer from the options given below:

- **A)** Statement I is incorrect but Statement II is true
- **B)** Both Statement I and Statement II are true
- **C)** Both Statement I and Statement II are false
- **D)** Statement I is correct but Statement II is false

3) How many sperms are formed from a secondary spermatocyte? **4.0**

- **A)** 4
- **B)** 8
- **C)** 2
- **D)** 1

4) Given below are two statements: **4.0**

Statement I: The most primitive of all craniates are jawless vertebrates.
Statement II: Cyclostomes have paired appendages and sucking circular mouth.
Choose the correct answer from the options given below:

- **A)** Statement I is incorrect but Statement II is true
- **B)** Both statement I and Statement II are true
- **C)** Both Statement I and Statement II are false
- **D)** Statement I is correct but statement II is false

5) Select the correct match with respect to infection and its causative agent: **4.0**

- **A)** Gonorrhoea - Trichomonas
- **B)** Genital warts - Treponema
- **C)** Syphilis - Neisseria
- **D)** Tetanus – Clostridium

6) Given below are two statements: **4.0**

Statement I: Sickle-cell anaemia is a sex-linked recessive disease.
Statement II: It is caused by the substitution of Glutamic acid (Glu) by Valine (Val) at eighth position of the beta globin chain of the haemoglobin molecule.
Choose the correct answer from the options given below:

A) Statement I is incorrect but Statement II is true
B) Both Statement I and Statement II are true
C) Both Statement I and Statement II are false
D) Statement I is correct but Statement II is false

7) Given below are two statements: **4.0**

Statement I: Morphine is extracted from the leaves of Cannabis sativa.
Statement II: Chikungunya and amoebic dysentery are both transmitted through mosquito as a vector.
Choose the correct answer from the options given below:

A) Statement I is incorrect but Statement II is true
B) Both Statement I and Statement II are true
C) Both Statement I and Statement II are false
D) Statement I is correct but Statement II is false

8) Which of the following is correct regarding thrombin? **4.0**

A) It is a protein of primary structure
B) Converts soluble fibrinogen of plasma into insoluble fibrin
C) Converts insoluble fibrinogen into insoluble fibrin
D) Converts fibrin into fibrinogen

9) In mammalian eye, the 'fovea' is the centre of the visual field where: **4.0**

A) High density of cones occur, but has no rods
B) The optic nerve leaves the eye
C) Only rods are present
D) More rods than cones are found

10) The diagram given here is the standard ECG of a normal person. The P-wave represents the: **4.0**

A) Contraction of both atria
B) Initiation of the ventricular contraction
C) Beginning of the systole
D) End of the systole

11) The most abundant protein in animals is – and most abundant protein on Earth is – respectively. **4.0**
Choose the option that fills the blanks correctly.

A) RUBisCO and Elastin
B) Collagen and Elastin
C) RuBisCO and Collagen
D) Collagen and RuBisCO

12) When does the Oxygen dissociation curve shift to the right? **4.0**

A) Decrease in acidity
B) Increase in carbon dioxide concentration
C) Decrease in temperature
D) Decrease in pH

13) Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R. **4.0**
Assertion A: After childbirth, a woman may experience difficulty releasing milk to feed her child
Reason R: This condition, known as lactation failure, can be due to insufficient stimulation of the mammary glands or improper latch during breastfeeding, hindering the milk ejection reflex.
In the light of the above statements, choose the most appropriate answer from the options given below:

A) Both A and R are correct but R is NOT the correct explanation of A
B) A is correct but R is not correct
C) A is not correct but R is correct
D) Both A and R are correct and R is the correct explanation of A

14) In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by: **4.0**

A)
B)
C)
D)

15) Given below are two statements: **4.0**

Statement I: Blood is a fluid connective tissue.
Statement II: Cells of blood form matrix and structural proteins like other connective tissues.
Choose the correct answer from the options given below:

A) Statement I is incorrect but Statement II is true
B) Both Statement I and Statement II are true
C) Both Statement I and Statement II are false
D) Statement I is correct but statement II is false

16) Find the odd one out. **4.0**

A) Sea cucumber
B) Sea urchin
C) Sea anemone
D) Sea lily

17) C-peptide of human insulin is **4.0**

- **A)** a part of mature insulin molecule
- **B)** responsible for its biological activity
- **C)** responsible for formation of disulphide bridges
- **D)** removed during maturation of pro-insulin to insulin

18) Neoplastic transformation may occur as a result of: **4.0**

- **A)** Non-ionizing radiation like X-rays
- **B)** Ionizing radiation like UV-rays
- **C)** Non-ionizing gamma rays
- **D)** Both ionizing and non-ionizing radiations

19) Which one of the following organisms is scientifically correctly named, correctly printed according to the International Rules of Zoological Nomenclature and correctly described? **4.0**

- **A)** Musca domestica - The common house lizard, a reptile
- **B)** Plasmodium falciparum - A protozoan pathogen causing the most serious type of malaria
- **C)** Felis tigris - The Indian tiger, well protected in Gir forests
- **D)** E. coli - Full name Entamoeba coli a commonly occurring bacterium in human intestine

20) Poikilothermic animals having monocondylic skull and amnion belong to the class: **4.0**

- **A)** Amphibia
- **B)** Reptilia
- **C)** Aves
- **D)** Mammalia

21) Removal of RNA polymerase III from nucleoplasm will affect the synthesis of: **4.0**

- **A)**
- **B)** RNA
- **C)** tRNA
- **D)**

22) Choose the correct statement regarding mode of transmission of HIV? **4.0**

- **A)** Drug addicts have least chance to be infected with AIDS
- **B)** Individuals who need repeated blood transfusion, HIV can be transmitted by sharing needles
- **C)** Contaminated through saliva
- **D)** Biting through contaminated mosquito

23) How do parasympathetic neural signals affect the working of the heart? **4.0**

- **A)** Reduce both heart rate and cardiac output
- **B)** Heart rate is increased without affecting the cardiac output
- **C)** Both heart rate and cardiac output increase
- **D)** Heart rate decreases but cardiac output

24) In counter current mechanism, the concentration gradient in the medullary interstitium is mainly maintained by **4.0**

A) and

B) NaCl and

C) NaCl and urea

D) and

25) The cartilage generally present on long bone terminals is: **4.0**

A) Hyaline cartilage

B) Fibrous cartilage

C) Hyaline and calcified cartilage

D) Elastic cartilage

26) Name the cytokines which is released in response to virus infection. **4.0**

A) Monokines

B) Lymphokines

C) Interleukins

D) Interferons

27) Given below are two statements: **4.0**

Statement I: The earliest organisms that appeared on the earth were non-green and presumably anaerobes.
Statement II: The first autotrophic organisms were the chemoautotrophs that never released oxygen.
Choose the correct answer from the options given below:

A) Statement I is incorrect but Statement II is true

B) Both Statement I and Statement II are true

C) Both Statement I and Statement II are false

D) Statement I is correct but statement II is false

28) Incorrect question formation: **4.0**

Which of the following is correct in regards to the diluted urine in the excretory system of human beings?

A) Nearly 99% of the glomerular filtrate is reabsorbed by the renal tubules

B) Ascending limb of the loop of Henle is impermeable to electrolytes

C) Descending limb of loop of Henle is impermeable to water

D) Distal convoluted tubule is incapable of reabsorbing

29) Which one of the following hormones maintains the Pregnancy in second trimester? **4.0**

A) LH (luteinizing hormone)

B) progesterone

C) estrogen

D) hCG (human Chorionic Gonadotropin)

30) Whose experiments cracked DNA and discovered triplet nature of genetic code? **4.0**

A) Nirenberg and Mathaei
B) Beadle and Tatum
C) Hershey and Chase
D) Morgan and Sturtevant

31) If one kidney is removed what will be the immediate effect? **4.0**

A) The person will die due to lack of urine formation
B) Uremia and death
C) Death due to poisoning
D) The person may survive

32) Uricotelic mode of excreting nitrogenous wastes is found in: **4.0**

A) Reptiles and birds
B) Birds and annelids
C) Amphibians and reptiles
D) Insects and amphibians

33) Volume of air that will remain in the lungs after a normal expiration is: **4.0**

A) FRC
B) VC
C) ERV
D) IRV

34) **4.0**

Blood groups	Receive Blood from	Donate Blood to
A		
B		' Q '
AB		AB
O	S '	

Choose the correct option for ' ' and ' S '

A) 'P'-A, AB; 'Q'-B, AB; 'R'-AB, A, B, O; 'S'-O
B) 'P'-A; 'Q'-O, A, B, AB; 'R'-AB, A, B, O; 'S'-A, B
C) 'P'-O; 'Q'-B, AB; 'R'-A; 'S'-AB, A, B, O
D) 'P'-O; 'Q'-O, A, B, AB; 'R'-B; 'S'-AB

35) A plover bird and crocodiles have a particular interaction, that is: **4.0**

A) Commensalism

B) Protocooperation

C) Mutualism

D) Competition

Section B

MCQ Single Correct. Attempt any 10 out of 15 Questions.

36) MALT is considered as the secondary lymphoid organ which is located within the lining of major tracts in the body. Here, MALT stands for: **4.0**

A) Metaderm Associated Lymphoid Tissues

B) Medulla Associated Lymphoid Tissues

C) Mucosal Associated Lymphoid Tissues

D) Mucosal Associated Leukemia Tissues

37) The figure shows the schematic plan of blood circulation in humans with labels A, B, C and D. Choose the correct option labelled with its functions. **4.0**

A) A - pulmonary vein - takes impure blood from body parts, Hg

B) B - pulmonary artery - takes blood from heart to lungs,

C) C - vena cava - takes blood from body parts to right auricle,

D) D - dorsal aorta - takes blood from heart to body parts, Hg

38) Which of the following is not observed during contraction of a muscle fibre? **4.0**

A) A bands retain the length

B) Shortening of sarcomere

C) I band gets reduced

D) H zone retains the length

39) Complete the following chart by choosing correct option for ' A ', 'B' and ' C '. **4.0**

A) A - Cellular B- Bilateral C - Coelomates

B) A - Cellular B - Asymmetry C - Eucoelomates

C) A - Cellular B - Asymmetry C - Enterocoelomate

D) A - Schiozo cellular B - Biradial C - Coelomates

40) Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R. **4.0**

Assertion A: Insulin is crucial for regulating blood glucose levels in humans.
Reason R: Insulin primarily functions in the digestion of dietary fats, influencing blood glucose indirectly through its impact on lipid metabolism.
In the light of the above statements, choose the most appropriate answer from the options given below:

A) Both A and R are correct but R is NOT the correct explanation of A

B) A is correct but R is not correct

C) A is not correct but R is correct

D) Both A and R are correct and R is the correct explanation of A

41) Select the Taxon mentioned which represent both marine and fresh water species. **4.0**

A) Echinoderms

B) Ctenophora

C) Cephalochordata

D) Cnidaria

42) Given below are two statements: **4.0**

Statement I: Darwin's variations are small and directional.
Statement II: Adaptive radiations leads to divergent evolution.
Choose the correct answer from the options given below:

A) Statement I is incorrect but Statement II is true

B) Both Statement I and Statement II are true

C) Both Statement I and Statement II are false

D) Statement I is correct but Statement II is false

43) What is the minimum number of plasma membrane that oxygen has to diffuse across to pass from air in the alveolus to haemoglobin inside a R.B.C.? **4.0**

A) Two
B) Three
C) Four
D) Five

44) Hypothalmic hormones are transported to neurohypophysis through: **4.0**

A) Portal vein
B) Portal artery
C) Axons
D) Lymph vessel

45) Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R. **4.0**
Assertion A: The Human Genome Project significantly contributed to understanding and mapping the entire human genome.
Reason R: Through massive international collaboration, the project employed advanced DNA sequencing technologies, enabling the identification and characterization of genes, leading to profound insights into human genetics and potential applications in medicine.
In the light of the above statements, choose the most appropriate answer from the options given below:

A) Both A and R are correct but R is NOT the correct explanation of A
B) A is correct but R is not correct
C) A is not correct but R is correct
D) Both A and R are correct and R is the correct explanation of A

46) Match the following symbols of the pedigree analysis, with their correct representation: **4.0**

Select the correct option from the following:

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

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

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

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

47) Which one of the following synovial joint is incorrectly matched with its position? **4.0**

A) Hinge Joint → Knee

B) Pivot Joint → Between Atlas and Axis

C) Gliding Joint → Between Carpal bones

D) Ellipsoid Joint → Between pectoral girdle and head of humerus

48) All are functions of Sertoli cells except: **4.0**

A) Formation of blood testis barrier

B) Secretion of smegma

C) Secretes Anti Mullerian Factor

D) Secretes Androgen Binding Protein

49) Which one is not a feature of Adamsia? **4.0**

A) Metagenesis

B) Gastrovascular cavity

C) Diploblastic

D) Cnidoblast

50) The genetic disease that transfers from a phenotypically normal but carrier female to only some of the male progenies. The disease is: **4.0**

A) Autosomal dominant

B) Autosomal recessive

C) Sex-linked dominant

D) Sex-linked recessive