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## 12TH CBSE PHYSICS PRACTICE TEST 1

**12th Standard**

**Physics**

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Multiple Choice Question 16 x 1 = 16

1) Electrostatic potential V at a point, distant r from a charge q varies as

(a) $q/r^2$ (b) $q^2/r$ (c) $q/r$ (d) $q^2/r^2$

2) Quantization of charge Implies:

(a) charge exists on particles (b) there is a minimum permissible magnitude of charge

(c) charge, which is a fraction of coulomb is not possible (d) none of the above

3) An aluminum wire is drawn through die so as to reduce its diameter to half. If the original resistance be R, the new resistance of the wire will be:

(a) R/16 (b) R/4 (c) 4R (d) 16R

4) 2 mA current is flowing in the wire of potentiometer of 5m long and 5 Ω resistance. The potential gradient is

(a) $2 \times 10^{-3}$ V/m (b) $2.5 \times 10^{-2}$ V/m (c) $1.6 \times 10^{-3}$ V/m (d) $2.3 \times 10^{-3}$ V/m

5) For measurement of potential difference, a potentiometer is preferred over voltmeter because

(a) potentiometer is more sensitive than voltmeter.

(b) the resistance of potentiometer is less than voltmeter. (c) potentiometer is cheaper than voltmeter

(d) potentiometer does not take current from the circuit.

6) In a permanent magnet at room temperature

(a) the magnetic moment of each molecule is zero

(b) the individual molecules have a non-zero magnetic moment which is all perfectly aligned

(c) domains are partially aligned (d) domains are all perfectly aligned.

7) During the propagation of electromagnetic waves in a medium

(a) electric energy density is equal to the magnetic energy density

(b) both electric and magnetic energy density are zero

(c) electric energy density is doubled off the magnetic energy density

(d) electric energy density is half of the magnetic energy density

8) The angle between pass axis of polarizer and analyzer is no The percentage of polarized light passing through analyzer is

(a) 100% (b) 50% (c) 25% (d) 75%

9) If the elctron frequency of light in a photoelectric experiment is doubled the stopping potential will

(a) be doubled (b) be halved (c) become more than double (d) become less than double

10) Hole is

(a) an anti-particle of electron (b) a vacancy created when an electron leaves a covalent bond

(c) absence of free electron (d) an artificially created particle

11) Image formed on the retina is

(a) real and inverted (b) virtual and erect (c) real and erect (d) virtual and inverted

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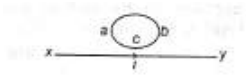
12) The direction of induced current in the loop abc is




(a) along abc if I decreases (b) along acb if I increases (c) along abc if I is constant

(d) along abc if I increases

13) The magnetic lines of force inside a bar magnet

(a) are from north-pole to south-pole of the magnet (b) do not exist.

(c) depend upon the area of cross-section of the bar magnet.

(d) are from south-pole to north-pole of the magnet

14) To reduce the reasonant frequency in an LCR series circuit with a generator

(a) the generator frequency should be reduced

(b) another capacitor should be added in parallel to the first

(c) the iron core of the inductor should be removed (d) dielectric in the capacitor should be removed

15) As the mass number 'A' increases, which of the following quantities related to nucleus do not change?

(a) mass (b) volume (c) density (d) binding energy

16) Isotopes have

(a) same number of protons (b) same number of nucleons (c) same number of neutrons

(d) same number of positrons

Assertion and reason 4 x 1 = 4

17) **Assertion (A)** : Electric potential of the earth is zero.

**Reason (R) :** The electric field due to the earth is zero.

**Codes:**

(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 and R is also false

18) **Assertion (A)** : In photo emissive cell inert gas is used.

**Reason (R)** : Inert gas in the photoemissive cell gives greater current.

**Codes:**

(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 and R is also false

19) **Assertion (A)** : Total energy of revolving electron in any stationary orbit is negative.

**Reason (R)** : Energy is a scalar quantity. It can have positive or negative value.

**Codes:**

(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 and R is also false

20) **Assertion (A)** : There is a chain reaction when uranium is bombarded with slow neutrons.

**Reason (R)** : When uranium is bombarded with slow neutrons more neutrons are produced.

**Codes:**

(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 and R is also false

2 Marks 5 x 2 = 10

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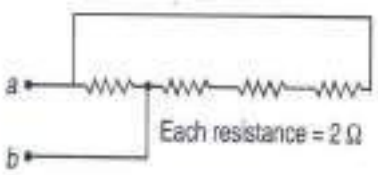
21) What should be charge on a sphere of radius 2cm so that when it is brought in contact with another sphere of radius 5cm carrying a charge of dc $j$ , there is no net transfer of charge between the spheres?

22) Calculate $R_{ab}$ in the following circuit:




23) An electric of 0.25 A flows in a loop of radius 0.2 cm. What is the magnitude of dipole moment ?

24) Why are alkali metal surfaces most suited as photosensitive surfaces?

25) A concave mirror of small aperture forms a sharper image. Why?

3 Marks 6 x 3 = 18

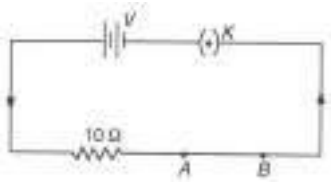
26) A regular hexagon of side 10 cm has a charge 5 C at each of its vertices. Calculate the potential at the centre of the hexagon.

27) A radio can tune in to any station in the 7.5 MHz to 12 MHz band. What is the corresponding wavelength band?

28) Double-convex lenses are to be manufactured from a glass of refractive index 1.55, with both faces of the same radius of curvature. What is the radius of curvature required if the focal length is to be 20cm?

29) A closely wound solenoid of 800 turns and area of cross section $2.5 \times 10^{-4}$ $m^2$ carries a current of 3.0 A. Explain the sense in which the solenoid acts like a bar magnet. What is its associated magnetic moment?

30) In the circuit shown here AB is a 2m long wire having a resistance of 5 . What battery voltage V will cause a potential gradient of 2V/m along the wire AB?




31) A circular coil of 20 turns and radius 10 cm is placed in a uniform magnetic field of 0.10 T normal to the plane of the coil. If the current in the coil is 5.0 A, what is the
(a) total torque on the coil,
(b) total force on the coil,
(c) average force on each electron in the coil due to the magnetic field?
(The coil is made of copper wire of cross-sectional area $10^{-5}$ $m^2$, and the free electron density in copper is given to be about $10^{29}$ $m^{-3}$)

Case Study Questions 3 x 4 = 12

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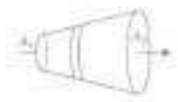
32) The flow of charge in a particular direction constitutes the electric current. Current is measured in Ampere. Quantitatively, electric current in a conductor across an area held perpendicular to the direction of flow of charge is defined as the amount of charge is flowing across that area per unit time.
Current density at a point in a conductor is the ratio of the current at that point in the conductor to the area of cross section of the conductor of that point.
The given figure shows a steady current flows in a metallic conductor of non uniform cross section. Current density depends inversely on area, so, here \(J_{1} > J_{2}, \text { as } A_{1}.



(i) What is the current flowing through a conductor, if one million electrons are crossing in one millisecond through a cross-section of it ?

**(a) $2.5 \times 10^{-10}$ A** **(b) $1.6 \times 10^{-10}$ A**

**(c) $7.5 \times 10^{-9}$ A** **(d) $8.2 \times 10^{-11}$ A**

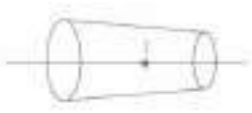
(ii) SI unit of electric current is

**(a) Cs** **(b) $Ns^{-2}$** **(c) $Cs^{-1}$** **$C^{-1}s^{-1}$**

(iii) A steady current flows in a metallic conductor of non-uniform cross-section. Which of these quantities is constant along the conductor?

**(a) Electric field** **(b) Drift velocity** **(c) Current** **(d) Current density**

(iv) A constant current I is flowing along the length of a conductor of variable cross-section as shown in the figure. The quantity which does not depend upon the area of cross-section is



**(a) electron density** **(b) current density**

**(c) drift velocity** **(d) electric field**

(v) When a current of 40 A flows through a conductor of area 10 $m^2$, then the current density is

**(a) 4 $A/m^2$** **(b) 1 $A/m^2$** **(c) 2 $A/m^2$** **(d) 8 $A/m^2$**

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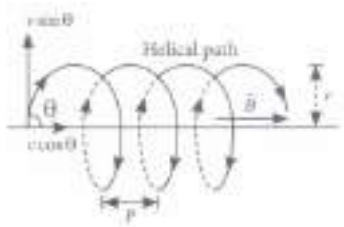
33) The path of a charged particle in magnetic field depends upon angle between velocity and magnetic field.If velocity is at angle to $i$ component of velocity parallel to magnetic field 3 4 remains constant and component of velocity perpendicular to magnetic field 3 4 is responsible for circular motion, thus the charge particle moves in a helical path.




The plane of the circle is perpendicular to the magnetic field and the axis of the helix is parallel to the magnetic field. The charged particle. moves along helical path touching the line parallel to the magnetic field passing through the starting point after each rotation.
Radius of circular path is $\sqrt{\frac{}{\mathrm{d}\ i}}$

Hence the resultant path of the charged particle will be a helix, with its axis along the direction of $i$ as shown in figure.

(i) When a positively charged particle enters into a uniform magnetic field with uniform velocity, its trajectory can be (i) a straight line (ii) a circle (iii) a helix.

**(a) (i) only (b) (i) or (ii)**
**(c) (i) or (iii) (d) anyone of (i), (ii) and (iii)**

(ii) Two charged particles A and B having the same charge, mass and speed enter into a magnetic field in such a way that the initial path of A makes an angle of 30° and that of B makes an angle of 90° with the field. Then the trajectory of

**(a) B will have smaller radius of curvature than that of A**
**(b) both will have the same curvature**
**(c) A will have smaller radius of curvature than that of B**
**(d) both will move along the direction of their original velocities.**

(iii) An electron having momentum 2.4 x $10^{-23}$kg m/ s enters a region of uniform magnetic field of 0.15 T. The field vector makes an angle of 30° with the initial velocity vector of the electron. The radius of the helical path of the electron in the field shall be

**(a) 2 mm (b) 1 mm** 3 4 $\frac{\bar{\mathrm{m}}}{\mathrm{i}}$ **(d) 0.5 mm**

(iv) The magnetic field in a certain region of space is given by $i$ $\sqrt{}$ ° and dc $^{\mathrm{i}}$ T. A proton is shot into the field with velocity $\sqrt{}$ )i dc° 8 n dc° b The proton follows a helical path in the field. The distance moved by proton in the x-direction during the period of one revolution in the yz-plane will be (Mass of proton = 1.67 x $10^{-27}$kg)

**(a) 0.053 m (b) 0.136 m (c) 0.157 m (d) 0.236 m**

(v) The frequency of revolution of the particle is

3 4 $\frac{}{i}$ 3 4 $\frac{i}{\mathrm{i}}$ 3 4 $\frac{\mathrm{i}}{}$ 3 4 $\frac{\mathrm{i}}{}$

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34) Photoelectric effect is the phenomenon of emission of electrons from a metal surface, when radiations of suitable frequency fallon them. The emitted electrons are called photoelectrons and the current so produced is called photoelectric current.

(i) With the increase of intensity of incident radiations on photoelectrons emitted by a photo tube, the number of photoelectrons emitted per unit time is

**(a) increases** **(b) decreases**

**(c) remains same** **(d) none of these**

(ii) It is observed that photoelectron emission stops at a certain time t after the light source is switched on. The stopping potential (V) can be represented as

**(a) $2(KE_{max}/e)$** **(b) $(KE_{max}/e)$**

**(c) $(KE_{max}/3e)$** **(d) $(KE_{max}/2e)$**

(iii) A point source of light of power $3.2 \times 10^{-3}$ W emits monoenergetic photons of energy 5.0 eV and work function 3.0 eV. The efficiency of photoelectron emission is 1 for every $10^6$ incident photons. Assume that photoelectrons are instantaneously swept away after emission. The maximum kinetic energy of photon is

**(a) 4 eV** **(b) 5 eV**

**(c) 2 eV** **(d) Zero**

(iv) Which of the following device is the application of Photoelectric effect?

**(a) Light emitting diode** **(b) Diode**

**(c) Photocell** **(d) Transistor**

(v) If the frequency of incident light falling on a photosensitive metal is doubled, the kinetic energy of the emitted photoelectron is

**(a) unchanged** **(b) halved**

**(c) doubled** **(d) more than twice its initial value**

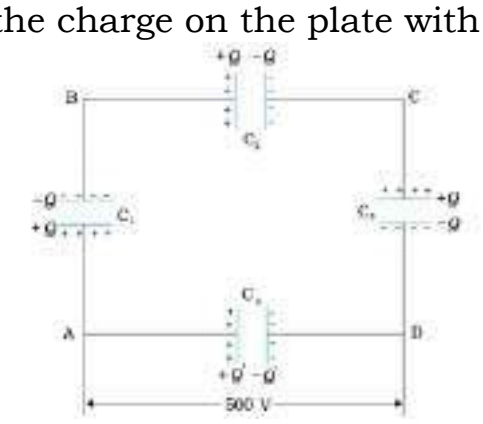
5 Marks 3 x 5 = 15

35) A network of four 10 μF capacitors is connected to a 500 V supply, as shown in Fig. Determine

(a) the equivalent capacitance of the network and

(b) the charge on each capacitor.

(Note, the charge on a capacitor is the charge on the plate with higher potential, equal and opposite to the charge on the plate with lower potential)




36) Coulomb's law for electrostatic force between two point charges and Newton's law for gravitational force between two stationary point masses, both have inverse-square dependence on the distance between the charges and masses respectively.

(a) Compare the strength of these forces by determining the ratio of their magnitudes

(i) for an electron and a proton and

(ii) for two protons.

(b) Estimate the accelerations of electron and proton due to the electrical force of their mutual attraction when they are 1 Å (= $10^{-10}$ m) apart? ($m_p = 1.67 \times 10^{-27}$ kg, $m_e = 9.11 \times 10^{-31}$ kg)

37) An electron emitted by a heated cathode and accelerated through a potential difference of 2.0 kV, enters a region with uniform magnetic field of 0.15 T. Determine the trajectory of the electron if the field

(a) is transverse to its initial velocity,

(b) makes an angle of 30° with the initial velocity.

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## 12TH CBSE PHYSICS PRACTICE TEST 2

**12th Standard**

**Physics**

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Multiple Choice Question 18 x 1 = 18

1) Which of the following is not an insulator?

(a) glass (b) rubber (c) ebonite (d) human body

2) Electrical capacity of earth is

(a) 1F (b) 1 λ (c) 711 λ (d) ... he··· λ

3) A hemisphere is uniformly charged positively. The electric field at a point on a diameter away from the centre is directed

(a) perpendicular to the diameter (b) parallel to the diameter

(c) at an angle tilted towards the diameter (d) at an angle tilted away from the diameter

4) The surface density on the copper sphere is σ. The electric field strength on the surface of the sphere is:

(a) σ (b) $\sigma/2$ (c) $\sigma/\varepsilon_0$ (d) $\sigma/2\varepsilon_0$

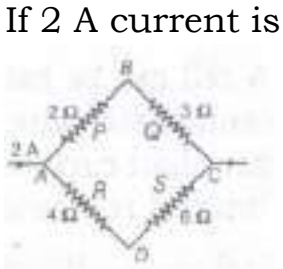
5) The electric field at 20 from the centre of a uniformly charged hollow sphere of radius 10 cm is E. Then at a distance 5 cm from the centre it will be

(a) 16E (b) 2E (c) Zero (d) 4E

6) Ohms law is valid when the temperature of the conductor is:

(a) constant (b) very high (c) very low (d) varying

7) If 2 A current is flowing in the shown circuit, then potential difference (VB - VD) in balanced condition is




(a) 12 V (b) 6 V (c) 4 V (d) zero

8) In a plane electromagnetic wave, the electric field oscillates sinusoidally at a frequency of $2.5 \times 10^{10}$ Hz and amplitude 480 V/m.The amplitude of oscillating magnetic field will be

(a) $1.52 \times 10^{-8}$ Wb/m$^2$ (b) $1.52 \times 10^{-7}$ Wb/m$^2$ (c) $1.6 \times 10^{-6}$ Wb/m$^2$ (d) $1.6 \times 10^{-7}$ Wb/m$^2$

9) One cannot see through fog, because

(a) fog absorbs the light (b) light suffers total reflection at droplets

(c) refractive index of the fog is infinity (d) light is scattered by droplets

10) A beaker containing a liquid appears to be half full when it is actually one third full. The refractive index of liquid is

(a) 7/6 (b) 6/5 (c) 3/2 (d) 5/4

11) Ratio of intensities of two waves is 9 : 1. If these waves are superimposed, what is the ratio of maximum and minimum intensities?

(a) 9 : 1 (b) 3 : 1 (c) 4 : 1 (d) 5 : 3

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12) The wavelength of a photon needed to remove a proton from a nucleus which is bound to the nucleus with 1 MeV energy is nearly

(a) 1.2 nm (b) 1.2xhe $^{r}$nm (c) 1.2xhe $^{\times}$nm (d) 1.2xhe$^{h}$nm

13) The photoelectric effect can be explained by

(a) Corpuscular theory of light (b) Wave nature of light (c) Bohr's theory

(d) Quantum theory of light

14) A hollow prism is filled with water and placed in air, It will deviate the incident rays

(a) towards the base (b) away from base (c) parallel to base

(d) towards or away from base depending on the location

15) First and second focal lengths of spherical surface of n refractive index are $f_1$ and $f_2$ respectively. The relation between them, is

(a) $f_2 = f_1$ (b) $f_2 = -f_1$ (c) $f_2 = nf_1$ (d) $f_2 = -nf_1$

16) In a permanent magnet at room temperature,

(a) magnetic moment of each molecule is zero

(b) the individual molecules have non-zero magnetic moment which are all perfectly aligned

(c) domains are partially aligned (d) domains are all perfectly aligned

17) A set of atoms in an excited state decays

(a) in general to any of the states with lower energy

(b) into a lower state only when excited by an external electric field

(c) all together simultaneously into a lower state (d) to emit protons only when they collide.

18) The number of neutrons in a $_{84}PO^{218}$nucleus is

(a) 84 (b) 218 (c) 222 (d) 134

Assertion and reason 2 x 1 = 2

19) **Assertion (A)** : Lines of force are perpendicular to conductor surface.
**Reason (R) :** Generally electric field is perpendicular to equipotential surface.
**Codes:**
(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 and R is also false

20) Assertion (A) : Manganin and constantan are widely used in standard resistors.
Reason (R) : Manganin and constantan resistances values would change very little with temperatures.
(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) Assertion is true but Reason is false.
(d) Assertion is false but Reason is true.

2 Marks 5 x 2 = 10

21) A point charge 9 he is at a distance 5cm directly above the centre of square of side 10cm as shown in fig.What is the magnitude of the electric flux through the square?


22) Two wires of equal length one of copper and other of manganin have the same resistance. Which wire is thicker?

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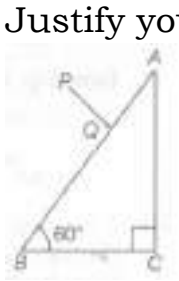
23) What is the tendency of parallel beam of electron moving uniformly in vaccuum with
(i) normal speed
(ii) with high speed.

24) Green light of mercury has a wavelength 5 x $10^{-5}$ crn.
(i) What is the' frequency in MHz and period in second in vacuum?
(ii) What is the wavelength in glass, if refractive index of glass is 1.5?

25) A ray PQ incident normally on the refracting face BA is refracted in the prism BAC made of material of refractive index 1.5. Complete the path of ray through the prism. From which face will the ray emerge? Justify your answer.



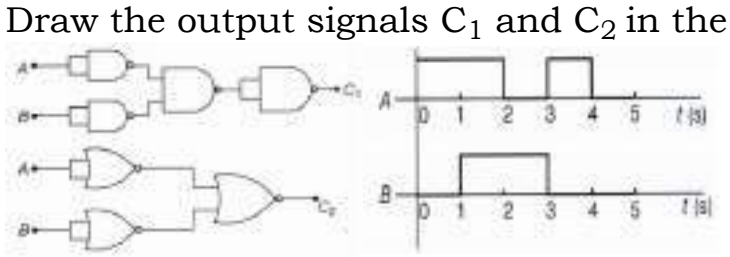

3 Marks 6 x 3 = 18

26) When a glass rod is rubbed rod is rubbed with a silk cloth, charges appear on both. A similar phenomenon is observed with many other pairs of bodies. Explain how this observation is consistent with the law of conservation of charge.

27) A voltage of 30 V is applied across a carbon resistor with first, second and third strips or bands of blue, black and yellow colours respectively. Find the value of current through the resistor.

28) Give reasons for the following:
(i) Long distance radio broadcasts use short wave bands.
(ii) The small ozone layer on top of the stratosphere is crucial for human survival
(iii) Satellites are used for a long distance TV transmission.

29) Draw the output signals $C_1$ and $C_2$ in the combination of gates




30) The earth's magnetic field at the equator is approximately 0.4 G. Estimate the earth's dipole moment.

31) Draw a schematic sketch of an AC generator describing its basic elements. State briefly its working principle. Show a plot of variation of
(i) magnetic flux and
(ii) alternating emf versus time generated by a loop of wire rotating in a magnetic field.

Case Study Questions 3 x 4 = 12

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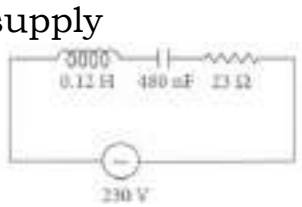
32) When the frequency of ac supply is such that the inductive reactance and capacitive reactance become equal, the impedance of the series LCR circuit i equal to the ohmic resistance in the circuit. Such a series LCR circuit is known as resonant series LCR circuit and the frequency of the ac supply is known as resonant frequency

Resonance phenomenon is exhibited by a circuit only ifboth Land C are present in the circuit. We cannot have resonance in a RL or RC circuit

A series LCR circuit with $Z$ eHn $=R$ w\e $=$ nr is connected to a 230 V variable frequency supply




(i) Find the value of source frequency for which current amplitude is maximum

**(a) 222.32 Hz** **(b) 550.52 Hz** **(c) 663.48 Hz** **(d) 770 Hz**

(ii) The value of maximum current is

**(a) 14.14 A** **(b) 22.52 A** **(c) 50.25 A** **(d) 47.41 A**

(iii) The value of maximum power is

**(a) 2200 W** **(b) 2299.3 W** **(c) 5500 W** **(d) 4700 W**

(iv) What is the Q-factor of the given circuit?

**(a) 25** **(b) 42.21** **(c) 35.42** **(d) 21.74**

(v) At resonance which of the following physical quantity is maximum?

**(a) Impedance** **(b) Current** **(c) Both (a) and (b)** **(d) Neither (a) nor (b)**

33) Hydrogen spectrum consists of discrete bright lines in a dark background and it is specifically known as hydrogen emission spectrum. There is one more type of hydrogen spectrum that exists where we get dark lines on the bright background, it is known as absorption spectrum. Balmer found an empirical formula by the observation of a small part of this spectrum and it is represented by

$\frac{h}{}$ $\left)\frac{h}{n^n}\right.$ $\frac{h}{n}$ $=$ r=w== F

For Lyman series, the emission is from first state to $n^{th}$ state, for Paschen series, it is from third state to $n^{th}$ state, for Brackett series, it is from fourth state to $n^{th}$ state and for Pfund series, it is from fifth state to $n^{th}$ state,

(i) Number of spectral lines in hydrogen atom is

**(a) 8** **(b) 6** **(c) 15** **(d)**

(ii) Which series of hydrogen spectrum corresponds to ultraviolet region?

**(a) Balmer series** **(b) Brackett series** **(c) Paschen series** **(d) Lyman series**

(iii) Which of the following lines of the H-atom spectrum belongs to the Balmer series?

**(a) 1025** **(b) 1218** **(c) 4861** **(d) 18751**

$F$ $F$ $F$ $F$

(iv) Rydberg constant is

**(a) a universal constant**

**(b) same for same elements**

**(c) different for different elements**

**(d) none of these**

(v) Hydrogen atom is excited from ground state to another state with principal quantum number equal to 4. Then the number of spectral lines in the emission spectra will be

**(a) 3** **(b) 5** **(c) 6** **(d) 2**

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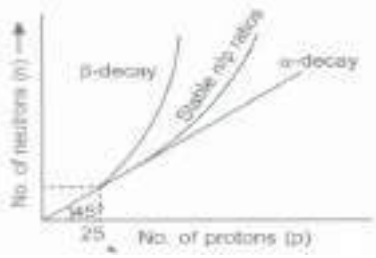
34) If all the known isotopes of the elements are plotted on a graph of number of neutrons (n) vs number of protons (P), it is observed that all isotopes lying outside of a "stable" – ratio region are radioactive as shown in the figure below.




The graph exhibits straight line behaviour upto

p = 25 )– h

For p > 25, – h

all these isotopes above the stable region generally undergo beta decay. Very heavy isotopes (p > 83) are unstable as their nucleus is very large, and undergoes a-decay. y-ray emission does not involve the release of a particle. It represents a change in an atom from a higher energy level to a lower energy level.

(i) How would the radioisotope of aluminium with atomic mass 29 decay?

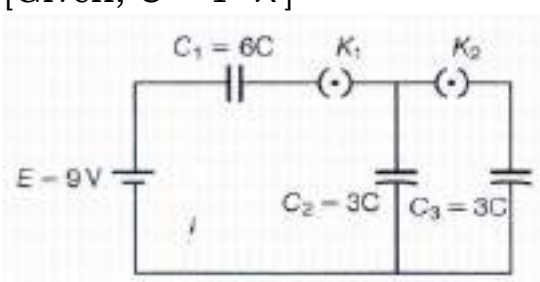
(ii) Thorium-230 undergoes a series of radioactive decay processes resulting in Bi-214 being the final product what was the sequence of the processes that occured? Atomic No. of Thorium = 90, At. No. of Bismuth = 83

(iii) Which of the radioactive emission has (a) maximum ionizing power (b) max penetrating power?

5 Marks 3 x 5 = 15

35) In the circuit shown in figure, initially $K_1$ is closed and $K_2$ is opened. What are the charges on each of the capacitors? If $K_1$ was opened and $K_2$ was closed (order is important), what will be the charge on each capacitor now?

[Given, C = 1 λ]

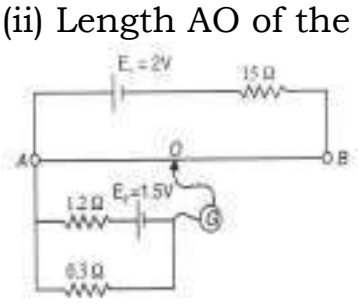



36) AB is 1m long uniform wire o 10 resistance. The other data are shown in the circuit diagram given below:

Calculate

(i) Potential gradient along AB and

(ii) Length AO of the wire when the galvanometer shows no deflection.




37) Discuss the sensitivity of a moving coil galvanometer.

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## 12TH CBSE PHYSICS PRACTICE TEST 3

**12th Standard**

**Physics**

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Multiple Choice Question 18 x 1 = 18

1) The dimensional formula of electric flux is

(a) $[M^1L^2T^{-2}A^{-1}]$ (b) $[M^{-1}L^3T^{-3}A]$ (c) $[M^1L^3T^{-3}A^{-1}]$ (d) $[M^1L^{-3}T^{-3}A^{-1}]$

2) The torque on an electric dipole of moment ρ when placed in electric field E is proportional to

(a) ρE (b) ρ/E (c) E/ρ (d) none of the above

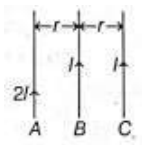
3) A wire is cut into 4 pieces, which are put together side by side to obtain one conductor. If the original resistance of the wire was R, the resistance of the bundle will be:

(a) R/4 (b) R/8 (c) R/16 (d) R/32

4) A proton and an alpha particle both enter a region of uniform magnetic field B, moving at right angles to the field B. If the radius of circular orbits for both the particles is equal and the kinetic energy acquired by proton is 1 MeV, the energy acquired by the alpha particles will be :

(a) 1 MeV (b) 4 MeV (c) 0.5 MeV (d) 1.5 MeV

5) Three infinitely long parallel straight current carrying wires A, B and C are kept at equal distance from each other as shown in the figure. The wire C experiences net force F. The net force on wire C, when the current in wire A is reversed will be




(a) zero (b) F/2 (c) F (d) 2F

6) The range of wavelength of the visible light is

(a) 10 A to 100 A (b) 4000 A to 8000 A (c) 8000 A to 10000 A (d) 10000 A to 15000 A

7) What is the focal length of the a bi convex lens of radius curvature 40cm. (μ = 1.5)

(a) 50cm (b) 40cm (c) -30cm (d) -40cm

8) The slope of frequency of incident light and stopping potential for a given surface will be

(a) h (b) h/e (c) eh (d) e

9) The energy of photon of wavelength 450 nm is

(a) $2.5 \times 10^{-17}$ J (b) $1.25 \times 10^{-17}$ J (c) $4.4 \times 10^{-19}$ J (d) $2.5 \times 10^{-19}$ J

10) The electrical conductivity of a semiconductor increases when electromagnetic radiation of wavelength shorter than 2480 nm is incident on it. The band gap (in e V) for the semiconductor is

(a) 0.9 (b) 0.7 (c) 0.5 (d) 1.1

11) At a certain temperature in an intrinsic semiconductor, the electrons and holes concentration is $1.5 \times 10^{16}$ $m^{-3}$.When it is doped with a trivalent dopant, hole concentration increases to 4.5 $10^{22}$ $m^{-3}$. In the doped semiconductor, the concentration of electrons ($n_e$) will be

(a) $3 \times 10^6$ $m^{-3}$ (b) $5 \times 10^7$ $m^{-3}$ (c) $5 \times 10^9$ $m^{-3}$ (d) $6.75 \times 10^{38}$ $m^{-3}$

12) One metallic sphere A is given positive charge whereas another identical metallic sphere B of exactly same mass as of A is given equal amount of negative charge. Then

(a) mass of A and mass of B still remain equal (b) mass of A increases (c) mass of B decreases

(d) mass of B increases

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13) The direction of induced current is decided by

(a) Lenz's law (b) Fleming's left hand rule (c) Biot-Savart's law (d) Ampere's law

14) The power factor varies between

(a) 2 and 2.5 (b) 3.5 to 5 (c) 0 to 1 (d) 1 to 2

15) A 15Ω resistor, an 80 mH inductor and a capacitor of capacitance Care connected in series with a 50 Hz AC source. If the source voltage and current in the circuit are in phase, then the value of capacitance is

(a) 100 μF (b) 127 μF (c) 142 μF (d) 160 μF

16) If 13.6 eV energy is required to ionise the hydrogen atom, then energy required to remove an electron from n = 2 is

(a) 10.2 eV (b) 0 eV (c) 3.4 eV (d) 6.8 eV

17) Atomic mass unit (1 u) is

(a) 1/12 of mass of $^{12}C$ atom (b) 1/14 of mass of $^{14}C$ atom (c) 1/12 of mass of $^{14}C$ atom

(d) 1/6 of mass of $^{12}C$ atom

18) In a nuclear reactor, moderators slow down the neutrons which come out in a fission process. The moderator used have light nuclei. Heavy nuclei will not serve the purpose, because

(a) they will break up (b) elastic collision of neutrons with heavy nuclei will not slow them down

(c) the net weight of the reactor would be unbearably high

(d) substances with heavy nuclei do not occur in liquid or gaseous state at room temperature

Assertion and reason 2 x 1 = 2

19) **Assertion (A)** : The surface of a conductor is an equipotential surface.
**Reason (R) :** Conductor allows the flow of charge.
**Codes:**
(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 and R is also false

20) **Assertion (A)** : Magnetic moment is measured in joule/tesla or amp $m^2$.
**Reason (R) :** Joule/tesla is equivalent to amp $m^2$
**Codes:**
(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 and R is also false

2 Marks 5 x 2 = 10

21) Consider a tightly wound 100 turn coil of radius 10 cm, carrying a current of 1 A. What is the magnitude of the magnetic field at the centre of the coil?

22) (a) Explain the meaning of the statement 'electric charge of a body is quantised'.
(b) Why can one ignore quantisation of electric charge when dealing with macroscopic i.e., large scale charges?

23) A short bar magnet placed with its axis at 30° with a uniform external magnetic field of 0.25 T experiences a torque of magnitude equal to 4.5 x $10^{-2}$ J. What is the magnitude of magnetic moment of the magnet?

24) Given the mass of iron nucleus as 55.85u and A = 56, find the nuclear density?

25) Why do Ge and Si are semiconductors?

3 Marks 6 x 3 = 18

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26) (a) Determine the electrostatic potential energy of a system consisting of two charges 7 μC and –2 μC (and with no external field) placed at (–9 cm, 0, 0) and (9 cm, 0, 0) respectively.
(b) How much work is required to separate the two charges infinitely away from each other?
(c) Suppose that the same system of charges is now placed in an external electric field E = A $(1/r^2)$; A = 9 x $10^5$ $NC^{-1}$ $m^2$. What would the electrostatic energy of the configuration be?

27) An iron rod of 0.2 $cm^2$ area of cross-section is subjected to a magnetising field of 1200 $Am^{-1}$ . If susceptibility of iron is 599, calculate (i) permeability, (ii) magnetic flux produced.

28) Two large, thin metal plates are parallel and close to each other. On their inner faces, the plates have surface charge densities of opposite signs and of magnitude 17.0 x $10^{-22}$ $C/m^2$. What is E:
(a) in the outer region of the first plate,
(b) in the outer region of the second plate, and
(c) between the plates?

29) (i) Derive the expression for the electric potential due to an electric dipole at a point on its axial line.
(ii) Depict the equipotential surfaces due to an electric dipole.

30) Define an equipotential surface. Draw equipotential surfaces
(i) in case of a single point charge
(ii) in a constant electric field in Z-direction. Why the equipotential surfaces about a single charge are not equidistant?
(iii) Can electric field exist tangential to, an equipotential surface? Give reason.

31) (i) State the working principle of a potentiometer. With the help of a circuit diagram, explain how a potentiometer is used to compare the emf of two primary cells. Obtain the required expression used for comparing the emfs.
(ii) Write two possible causes for one sided deflection in a potentiometer experiment.

Case Study Questions 3 x 4 = 12

32) A metal sphere of radius 10 cm is charged to a high voltage. If this metal sphere is mounted on a wooden block, then charge will reside on its surface and will not flow from it. As we know dielectric strength of air is 3 x $10^6$ V $m^{-1}$, then the surrounding air will start conducting and charge stored on the isolated sphere will be lost.
(i) Explain why air will start conducting if electric field exceeds dielectric strength?
(ii) Calculate the maximum charge this sphere can hold.
(iii) Why sometimes electric charge is leaked before the above value of potential is reached.

33) While comparing the interference pattern with that seen for a coherently illuminated single slit (usually called single slit diffraction pattern), the interference pattern has a number of equally spaced bright and dark bands. The diffraction pattern has a central bright maximum which is twice as wide as the other maxima. The intensity falls as we go to successive maxima away from the centre, on either side. Now answer the following questions:
(i) Why interference fringes are equispaced whereas that of diffraction are not?
(ii) Why intensity falls as we go to successive maxima away from central bright maximum?
(iii) For a single slit of width a, the first null point of the interference pattern occurs at an angle of /a. At the same angle of /a, we get a maximum (not a null) for two narrow slits separated by a distance a. Explain why?

34) A very small circular loop of area 5 x $10^{-4}$ $cm^2$ with resistance 4 is placed such that it is concentric and in the same plane with another loop of radius 10 cm. A constant current of 2A is passed in the bigger loop, which is rotated with angular speed of rad $S^{-1}$, about its diameter. The magnetic field produced due to the bigger loop provides magnetic flux, which is linked with smaller loop.
(i) Determine magnetic field at the centre.
(ii) Determine magnetic flux linked with smaller loop.
(iii) What is the value of induced emf and current in the smaller loop as a function of time.

5 Marks 3 x 5 = 15

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35) Two persons are standing under a tree and another person near them is inside a car. They were arguing about going out for a movie or to the beach, when a lightning struck the tree with some force. The person inside the car notices his friends satnding under the tree are affected by lightning, he comes out and takes them to the nearby hospital.
Why the person in the car was not affected by lighting?
What quality do you find the person inside the car?
Explain the process that takes place during lighting.
If the total charge enclosed by a surface is zero, then what will be the electric flux over the surface?

36) (i) State with the help of a circuit diagram, the working principle of a meter bridge. Obtain the expression used for determining the unknown resistance.
(ii) What happens if the galvanometer and cell are interchanged at the balance point of the bridge?
(iii) Why is it considered important to obtain the balance point near the mid-point of the wire?

37) Explain using a labelled diagram, the principle and working of a moving coil galvanometer. What is the function of
(i) uniform radial magnetic field
(ii) soft iron core?
Also, define the terms
(iii) current sensitivity and
(iv) voltage sensitivity of a galvanometer.
Why does increasing the current sensitivity not necessarily increase voltage sensitivity?

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# RAVI TEST PAPERS WHATSAPP 8056206308

## 12TH CBSE CHEMISTRY PRACTICE TEST 1

**12th Standard**

**Chemistry**

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Multiple Choice Question 18 x 1 = 18

1) If two substances A and B have $_C|\ _E\Delta >|$ B and have mole fraction in solution 1 : 2, then mole fraction of A in vapours is

(a) 0.33 (b) 0.25 (c) 0.52 (d) 0.2

2) The freezing point (in °C) of a solution containing 0.1 g of $K_3[Fe(CN)_6]$ (Mol. Wt. 329) in 100 g of water ($K_f$ = 1.86 K kg $mol^{-1}$) is

(a) B;C $\geq^B$ (b) T;e $\geq^B$ (c) T;e $\geq^C$ (d) >;B $\geq^B$

3) At 100°C, the vapour pressure of a solution of 6.5 g of solute in 100 g of water is 732 mm. If $K_b$ is 0.52 K/m, the boiling point of solution will be

(a) 102°C (b) 103°C (c) 101°C (d) 100°C

4) Among the following cells
Leclanche cell (I), Nickel-cadmium cell (II), Lead storage battery (III), Mercury cell (IV), primary cells are

(a) I and II (b) I and III (c) II and III (d) I and IV

5) When 0.1 mol $MnO_4^{2-}$ is oxidized, the quantity of electricity required to completely oxidize $MnO_4^{2-}$ to $MnO_4^-$ is

(a) 96500 C (b) 2 x 96500 C (c) 9650 C (d) 96.50 C

6) Rate constant of a reaction (k) is 175 $litre^2$ $mol^{-2}$ $sec^{-1}$. What is the order of reaction?

(a) first (b) second (c) third (d) zero

7) At 500 K, the half-life period of a gaseous reaction at the initial pressure of 80 kPa is 350 sec. When the pressure is 40 kPa, the half-life period is 175 sec. The order of reaction is

(a) second (b) more than zero but less than first (c) zero (d) first

8) In Arrhenius plot of Ink Vs $\geq$ is a linear plot obtained with slope of -2 x $10^4$ k. Ea of reaction in kJ $mol^{-1}$.

(a) 83 (b) 166 (c) 249 (d) 332 kJ $mol^{-1}$

9) $KMnO_4$ on heating to red hot gives

(a) $K_2MnO_4 + MnO_2 + O_2$ (b) $K_2MnO_3 + MnO_2 + O_2$ (c) $K_2O + MnO_2 + O_2$ (d) None of these

10) Four successive members of the first row transition elements are listed below with atomic numbers. Which one of them is expected to have the highest $I_{k\ B6<k}$ value ?

(a) Co (Z = 27) (b) Cr (Z = 24) (c) Mn (Z = 25) (d) Fe (Z = 26)

11) An example of ambidentate ligand is

(a) Ammine (b) Aquo (c) Oxalato (d) Thiacyanato

12) The compound $Na_2[Fe(CN)_5NO]$ is called

(a) sodium nitroprusside (b) sodium pentacyanonitrosonium ferrate (II)

(c) sodium pentacyanonitrosylferrate (III) (d) sodium nitrosoferrocyanide

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13) The correct increasing order of reactivity of halides for $S_N2$ reaction is

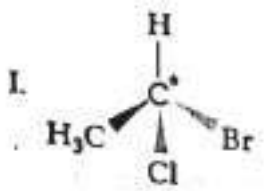
(a) $CH_3CH_2X < (CH3)_2CHX < CH_2 = CHCH_2X < PhCH_2X$

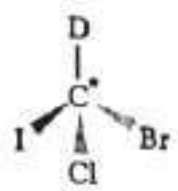
(b) $(CH_3)_2CHX < CH_3CH_2X < CH_2 = CHCH_2X < PhCH_2X$

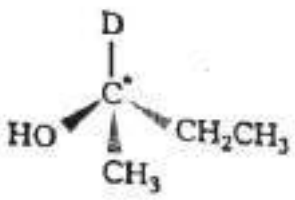
(c) $PhCH_2X < (CH_3)_2CHX < CH_3CH_2X < CH_2 = CHCH_2X$

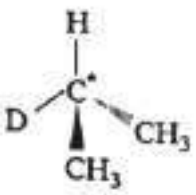
(d) $CH_2 = CHCH_2X < PhCH_2X < (CH_3)_2CHX < CH_3CH_2X$

14) In which of the following molecules, C atom marked with asterisk is chiral?

I. 


II. 


III. 

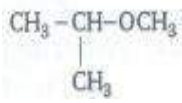

IV. 


(a) I, II, III (b) I, II, III, IV (c) II, III, IV (d) I, III, IV

15) When ethanol is heated with HI and red phosphorus, it gives

(a) ethyl iodide (b) ethane (c) ethylene (d) ether

16) IUPAC name of the compound

 is _____.

(a) 1-methoxy-1-methylethane (b) 2-methoxy-2-methylethane (c) 2-methoxypropane

(d) isoptopylmethyl ether

17) Which is most acidic?

(a) $CCl_3COOH$ (b) $CHCl_2COOH$ (c) $CH_2ClCOOH$ (d) $CH_3COOH$

18) Amongst the following, the strongest base in aqueous medium is _____.

(a) $CH_3NH_2$ (b) $NCCH_2NH_2$ (c) $(CH_3)_2NH$ (d) $C_6H_5NHCH_3$

Assertion and reason 2 x 1 = 2

19) **Assertion**: The vapour pressure of a liquid decreases if some non-volatile solute is dissolved in it.

**Reason:** The relative lowering of vapour pressure of a solution containing a non-volatile solute is equal to the mole fraction of thesolute in the solution.

(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.

20) **Assertion:** Substances like glass, ceramics, etc. having very low conductivity are known as insulators.

**Reason :** They do not allow the passage of electric current through them.

**Codes :**

(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.

2 Marks 5 x 2 = 10

21) What is osmosis? How does it differ from diffusion?

22) Define limiting molar conductivity. Why conductivity of an electrolyte solution decreases with decrease in concentration ?

23) A first order reaction takes 40 min for 30% decomposition. Calculate $t_{1/2}$ for the reaction. [log 1.428 = 0.1548]

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24) Assign reasons for the following:
(i) Copper (I) ion is not known in aqueous solution.
(ii) Actinoids exhibit greater range of oxidation states than lanthanoids.

25) Write ionisation isomer of $[Co(NH_3)_5 Br]SO_4$ .

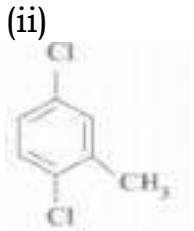
3 Marks 6 x 3 = 18

26) Express the rate of the following reaction in terms of different reactants and products: $4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$
If the rate of formation of NO is $3.6 \times 10^{-3} mol\ L^{-1}s^{-1}$, Calculate
(i) the rate of disappearance of $NH_3$
(ii) rate of formation of $H_2O$.

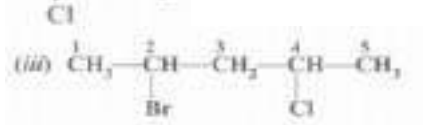
27) Give reasons for the following:
(i) Transition metals form alloys.
(ii) $Mn_2O_3$ is basic whereas $Mn_2O_7$ is acidic.
(iii) $Eu^{2+}$ is a strong reducing agent.

28) Write the name and draw the structure of each of the following complex compounds:
(i) $[Co(NH_3)_4(H_2O)_2]Cl_3$
(ii) $[Pt(NH_3)_4]\ [NiCl_4]$

29) Write the IUPAC name of
(i) $(CH_3)_2CHCH(Cl)CH_3$.
(ii)

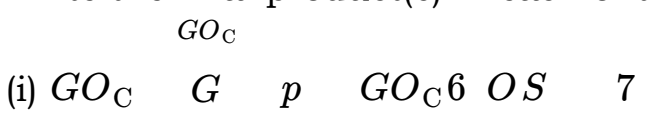



(iii)

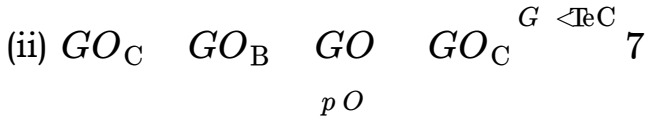



30) Write the final product(s) in each of the following reactions:

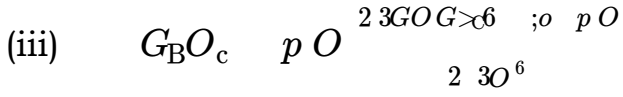
(i)



(ii)



(iii)



31) Complete the folowing reaction equations:
(i) $C_6H_5N_2Cl + CH_3COCl$
(ii) $C_2H_5NH_2 + C_6H_5SO_2Cl$
(iii) $C_2H_5NH_2 + HNO_2$

Case Study Questions 3 x 4 = 12

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32) **Read the passage given below and answer the following questions:**

The concentration of potassium ions inside a biological cell is at least twenty times higher than the outside. The resulting potential difference across the cell is important in several processes such as transmission of nerve impulses and maintaining the ion balance. A simple model for such a concentration cell involving a metal M is $M_{(s)}$ | $M^+$(aq.; 0.05 molar) || $M^+$(aq; 1 molar) |$M_{(s)}$.

**The following questions are multiple choice questions. Choose the most appropriate answer:**

(i) For the above cell,

**(a)** $I \quad \times = \quad N \rightarrow =$ **(b)** $I \quad \rightarrow = \quad N \times =$ **(c)** $I \quad \times = \quad N \quad \rightarrow =$ **(d)** $I \quad \rightarrow = \quad N \quad \times =$

(ii) The value of equilibrium constant for a feasible cell reaction is

**(a) < 1 (b) = 1 (c) > 1 (d) zero**

(iii) What is the emf ofthe cell when the cell reaction attains equilibrium?

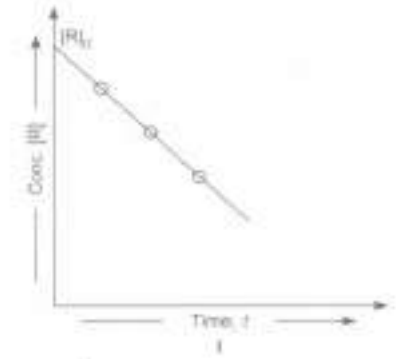
**(a) 1 (b) 0 (c) > 1 (d) < 1**

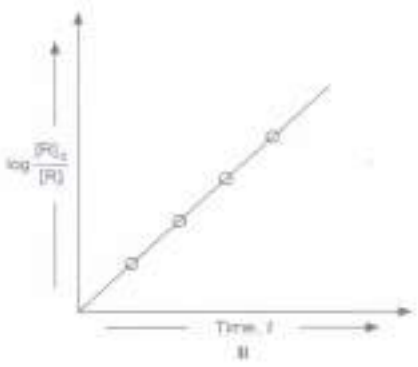
(iv) The potential of an electrode change with change in

**(a) concentration of ions in solution** **(b) position of electrodes**

**(c) voltage of the cell** **(d) all of these**

33) Observe the following graphs and answer the questions based on these graphs.




(a) What is order of reaction shown in graph I?

(b) What is slope in graph II?

(c) How does $t_{1/2}$ varies with initial concentration in zero order reaction.

(d) If $t_{1/2}$ of first order reaction is 40 minute, what will be $t_{99.9\%}$ for first order reaction?

(e) What is $t_{1/2}$ of zero order reaction in terms of 'k'?

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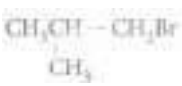
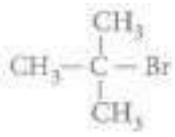
34) **Read the passage given below and answer the following questions:**

A primary alkyl halide (A) $C_4H_9Br$ reacted with alcoholic KOH to give compound (B). Compound (B) is reacted with HBr to give compound (C) which is an isomer of (A). When (A) reacted with sodium metal, it gave a compound (D) $C_8H_{18}$ that is different than the compound obtained when n-butyl bromide reacted with sodium metal

**The following questions are multiple choice questions. Choose the most ap appropriate answer:**

(i) Compound (A) is

**(a)** C B B B **(b)** 

**(c)**  **(d)** C B B

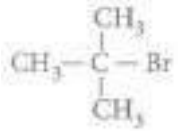
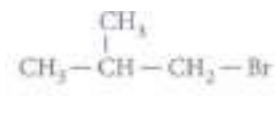
(ii) Which type of isomerism is present in compound (A) and (C)?

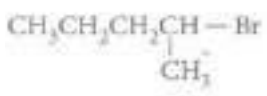
**(a) Positional** **(b) Functional** **(c) Chain** **(d) Both (a) and (c)**

(iii) IUPAC name of compound (D) is

**(a) n-octane** **(b) 2,5-dimethylhexane** **(c) 2-methylheptane** **(d) 3,4-dimethyl hexane.**

(iv) When compoound (C) is treated with alc. KOH and then treated with HBr in presence of peroxide, the compound obtained is

**a)**  **(b)** 

**(c)** C B B B **(d)** 

5 Marks 4 x 5 = 20

35) (a) Distinguish between molecularity an order of a reaction.

(b) The activation energy for the reaction

$2HI(g) \quad H_2(g) + I_2(g)$

is 209.5 kJ $mol^{-1}$ at 581 K. Calculate the fraction of molecules having energy equal to or greater than activation energy.

[R = 8.314 $JK^{-1}$ $mol^{-1}$]

36) Complete the following chemical reaction equations:

(i) $G\ p_e^B \quad 2\ 36\ O_B\ 2\ 36\ O^6\ 2\ 3$

(ii) $G\ p_e^B \quad 2\ 36\ O_B\ 2\ 36\ O^6\ 2\ 3$

(b) Explain the following observations:

(i) Transition metals form compounds which are usually coloured.

(ii) Transition metals exhibit variable oxidation states.

(iii) The actinoids exhibit a greater range of oxidation states than the lanthanoids.

37) Name the following polyhalogen compounds.

(i) Compound that act as a propellant in aerosols.

(ii) Compound that is used in the preparation of chloropicrin.

(iii) Compound that act as fire extinguisher.

(iv) Compound that is a cheap insecticide.

(v) Compound that is used in hair sprays.

38) (a) Write the structures of main products when products when benzene diazonium chloride reacts with the following reagents:

(i) $H_3PO_2+H_2O$

(ii) CuCN/KCN

(iii) $H_2O$

(b) Arrange the following in the increasing order of their basic character in an aqueous solution:

$C_2H_5NH_2$ , $(C_2H_5)_2NH$, $(C_2H_5)_3N$

(c) Give a simple chemical test to distinguish between the following pair of compounds:

$C_6H_5$-$NH_2$ and $C_6H_5$-NH-$CH_3$

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## 12TH CBSE CHEMISTRY PRACTICE TEST 2

**12th Standard**

**Chemistry**

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Multiple Choice Question 18 x 1 = 18

1) Molarity of the liquid HCL if density of the solution is 1.17 g/cc is

(a) 36.5 (b) 18.25 (c) 32.05 (d) 42.10

2) The mass of glucose that should be dissolved in 50 g of water in order to produce the same lowering of vapour pressure as produced by dissolving 1 g of urea in the same quantity of water is

(a) 1 g (b) 3g (c) 6 g (d) 8 g

3) van't Hoff factors x,y and z for association, dissociation and no change of solute in the solution respectively are in the order :

(a) x< y< z (b) x > z > y (c) x< z< y (d) x > y > z

4) Unit of ionic mobility is

(a) $m^2\ sec^{-1}\ volt^{-1}$ (b) $m\ s^{-1}$ (c) $m\ sec^{-1}\ volt$ (d) $m\ sec^{-1}\ volt^{-1}$

5) The cell, Zn | $Zn^{2+}$ (1 M) || $Cu^{2+}$ (1 M) | Cu, ($E_{cell}$ = 1.10 V), was allowed to be completely discharged at 298 K. The relative concentration of $Zn^{2+}$ to $Cu^{2+}$ , $\left)\frac{^{c8}}{R^{\ c8}}$ is

(a) $9.65 \times 10^4$ (b) antilog 24.08 (c) 37.3 (d) $10^{37.3}$

6) For a first order reaction, the time taken to reduce the initial concentration by a factor of $\frac{b}{e}$ is 20 minutes. The time required to reduce initial concentration by a factor of 1/16 is

(a) 20 min (b) 10 min (c) 80 min (d) 40 min (e) 5 min

7) $KMnO_4$, oxidation number of Mn is

(a) + 2 (b) + 4 (c) + 6 (d) + 7

8) Which of the following transition metals of 3d series has the lowest melting point ?

(a) Ti (Z = 22) (b) V (Z = 23) (c) Cr (Z = 24) (d) Mn (Z = 25) (e) Fe (Z = 26)

9) Potassium manganate ($K_2MnO_4$) is formed when

(a) Chlorine is passed through aqueous $KMnO_4$ solution.

(b) Manganese dioxide is fused with potassium hydroxide in air

(c) Formaldehyde reacts with potassium permanganate in presence of strong alkali.

(d) Potassium permanganate reacts with $H_2SO_4$.

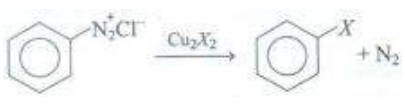
10) According to IUPAC nomenclature, sodium nitroprusside is named as

(a) Sodium nitroferricyanide (b) Sodium nitroferricyanide (c) Sodium pentacyanonitrosylferrate(II)

(d) Sodium pentacyano nitrosylferrate(III)

11) When 1 mol $CrCl_3.6H_2O$ is treated with excess of $AgNO_3$, 3 mol of AgCl are obtained. The formula of the complex is

(a) $[CrCl_3(H_2O)_3].3H_2O$ (b) $[CrCl_2(H_2O)_4]Cl.2H_2O$ (c) $[CrCl(H_2O)_5]Cl_2.H_2O$ (d) $[Cr(H_2O)_6Cl_3$

12) 


Which of the following do/does not match the equation?

(a) X = Cl (b) X = Br (c) X = I (d) Both (a) and (b)

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13) Phenol is less acidic than _____.

(a) ethanol (b) o- nitrophenol (c) o-methylphenol (d) o-methoxyphenol

14) Butan-2-one can be converted to propionic acid by which of the following :

(a) NaOH. $NaIH^+$ (b) Fehling solution (c) $NaOH,I_2/H^+$ (d) Tollens'reagent

15) Which of the following compounds gives dye test?

(a) Aniline (b) Methylamine (c) Diphenylamine (d) Ethylamine

16) Stronger base is

(a) $C_6H_5NH_2$ (b) $CH_2=CHCH_2NH$ (c) HC $CCH_2NH_2$ (d) $CH_3CH_2CH_2NH_2$

17) The amino acids are the product of the digestion of

(a) lipid (b) fats (c) protein (d) alcohol

18) Disaccharides that are reducing in nature are

(a) sucrose and lactose (b) sucrose and maltose (c) lactose and maltose (d) sucrose, lactose and maltose

Assertion and reason 2 x 1 = 2

19) In the following questions. an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.

**Assertion (A)** Ethanol and acetone show positive deviation from Raoult's law.

**Reason (R)** Pure ethanol molecule show hydrogen bond and on adding acetone hydrogen bond between ethanol molecules breaks

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

(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).

(c) (A) is correct; (R) is incorrect.

(d) (A) is incorrect; (R) is correct.

20) In the following questions.an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.

**Assertion (A)** Mercury cells give a constant voltage throughout its life.

**Reason (R)** Electrolyte KOH is not involved in the reaction.

**Codes:**

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

(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).

(c) (A) is correct; (R) is incorrect.

(d) (A) is incorrect; (R) is correct.

2 Marks 5 x 2 = 10

21) Calculate the osmotic pressure in pascals exerted by a solution prepared by dissolving 1.0 g of polymer of molar mass 185,000 in 450 ml of water at 37ºC.

22) The rate constant for a first order reaction is 60 $s^{-1}$. How much time will it take to reduce the initial concentration of the reactant to its $1/16^{th}$ value?

23) Why is the highest oxidation state of a metal exhibited in its oxide or fluoride only?

24) Alcohols are comparatively more soluble in water than hydrocarbons of compounds of comparable molecular masses. Explain this fact.

25) The freezing point of a solution composed of 5.85 g of NaCl in 100 g of water is - 3.348 ºC calculate the van't Hoff factor 'i' for this solution. $K_f$ (Water) = 1.86 K kg $mol^{-1}$

3 Marks 6 x 3 = 18

26) What is meant by positive and negative deviations from Raoult's law and how is the sign of H related to positive and negative deviations from Raoult's law?

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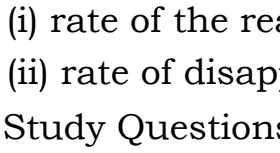
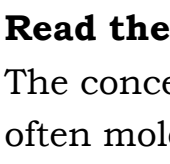
27) The rate constants of a reaction at 500 K and 700 K are 0.02 $s^{-1}$ and 0.07 $s^{-1}$ respectively. Calculate the values of $E_a$ and A.

28) Show how are the following alcohols prepared by the reaction of a suitable Grignard reagent on methanal?

(i)



(ii)



29) Give plausible explanation for each of the following:

(i) Cyclohexanone forms cyanohydrin in good yield but 2,2,6- trimethylcyclohexanone does not.

(ii) There are two -$NH_2$ groups in semicarbazide. However, only one is involved in the formation of semicarbazones.

(iii) During the preparation of esters from a carboxylic acid and an alochiol in the presence of an acid catalyst, the water or the ester should be removed as soon as it is formed.

30) 3.9 g of benzoic acid dissolved in 49 g of benzene shows a depression in freezing point of 1.62 K. Calculate the van't Hoff factor and predict the nature of solute (associated or dissociated). (Given : Molar mass of benzoic acid = 122 g $mol^{-1}$ , $K_f$ for benzene = 4.9 K kg $mol^{-1}$)

31) For an elementary reaction, 2A + B 3C, the rate of appearance of C at time 't' is 1.3 $10^{-4}$ mol $L^{-1}$ $s^{-1}$. Calculate the

(i) rate of the reaction

(ii) rate of disappearance of A

Case Study Questions 3 x 4 = 12

32) **Read the passage given below and answer the following questions:**

The concentration of a solute is very important in studying chemical reactions because it determines how often molecules collide in solution and thus indirectly determine the rate of reactions and the conditions at equilibrium.

There are several ways to express the amount of solute present in a solution. The concentration of a solution is a measure of the amount of solute that has been dissolved in a given amount of solvent or solution. Concentration can be expressed in terms of molarity, molality, parts per million, mass percentage, volume percentage, etc.

**The following questions are multiple choice questions. Choose the most appropriate answer:**

(i) The molarity (in mol $L^{-1}$) of the given solution will be

**(a) 1.56 (b) 1.89 (c) 0.263 (d) 1.44**

(ii) Which of the following is correct relationship between mole fraction and molality?

3 4 c $\frac{i_b}{b8\ i_b}$ 3 4 c $\frac{i_b}{b\ i_b}$

3 4 c $\frac{b8\ i_b}{i_b}$ 3 4 c $\frac{b\ i_b}{i_b}$

(iii) Which of the following is temperature dependent?

**(a) Molarity (b) Molality**

**(c) Mole fraction (d) Mass percentage**

(iv) Which of the following is true for an aqueous solution of the solute in terms of concentration?

**(a) 1 M = 1 m (b) 1M > 1m**

**(c) 1M < 1 m (d) Cannot be predicted**

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33) **Read the passage given below and answer the following questions:**

The electrochemical cell shown below is concentration cell. $M|M^{2+}$ (saturated solution of a sparingly soluble salt, $MX_2$ ) || $M^{2+}$ (0.001 mol $dm^{-3}$ ) | M The emf of the cell depends on the difference in concentrations of $M^{2+}$ ions at the two electrodes. The emf of the cell at 298 K is 0.059 V.

**The following questions are multiple choice questions. Choose the most appropriate answer:**

(i) The solubility product ($K_{sp}$, $mol^3$ $dm^{-9}$) of $MX_2$ at 298 K based on the information available for the given concentration cell is (take 2.303 x R x 298/P = 0.059)

**(a) 2 x $10^{-15}$** **(b) 4 x $10^{-15}$** **(c) 3 x $10^{-12}$** **(d) 1 x $10^{12}$**

(ii) The value of $\mu$ (in kJ $mol^{-1}$) for the given cell is (take 1F = 96500 C $mol^{-1}$)

**(a) 3.7** **(b) -3.7** **(c) 10.5** **(d) -11.4**

(iii) The equilibrium constant for the following reaction is

c8 8 e8 d8 8 d8

(Given, $p^{a}$ e8 V d8 bFee and $E^{o}$ $p$ d8 V c8 aF↔ )

**(a) 7.6 x $10^{12}$** **(b) 6.5 x $10^{10}$** **(c) 5.2 x $10^{9}$** **(d) 3.4 x $10^{12}$**

(iv) To calculate the emf of the cell, which of the following options is correct?

**(a) emf = $E_{cathode}$ - $E_{anode}$** **(b) emf = $E_{anode}$ - $E_{cathode}$**

**(c) emf = $E_{anode}$ + $E_{cathode}$** **(d) None of these**

34) **Read the passage given below and answer the following questions :**

In a reaction, the rates of disappearance of different reactants or rates of formation of different products may not be equal but rate of reaction at any instant of time has the same value expressed in terms of any reactant or product. Further, the rate of reaction may not depend upon the stoichiometric coefficients of the balanced chemical equation. The exact powers of molar concentrations of reactants on which rate depends are found experimentally and expressed in terms of 'order of reaction'. Each reaction has a characteristic rate constant depends upon temperature. The units of the rate constant depend upon the order of reaction.

**The following questions are multiple choice questions. Choose the most appropriate answer :**

(i) The rate constant of a reaction is found to be 3 x $10^{-3}$ $mol^{-2}$ $L^{2}$ $sec^{-1}$.The order of the reaction is

**(a) 0.5** **(b) 2** **(c) 3** **(d) 1**

(ii) In the reaction $F$ 8 d$L$ c$R$ ,the rate of formation of C is

**(a) the same as rate of consumption of A** **(b) the same as the rate of consumption of B**

**(c) twice the rate of consumption of A** **(d) 3/2 times the rate of consumption of B.**

(iii) Rate of a reaction can be expressed by following rate expression, Rate = k$[A]^2$ [B], if concentration of A is increased by 3 times and concentration of B is increased by 2 times, how many times rate of reaction increases?

**(a) 9 times (b) 27 times (c) 18 times (d) 8 times**

(iv) The rate of a certain reaction is given by,rate = k$[H^+]^n$ . The rate increases 100 times when the pH changes from 3 to 1. The order (n) of the reaction is

**(a) 2** **(b) 0** **(c) 1** **(d) 1.5**

5 Marks 4 x 5 = 20

35) A solution of glucose in water is labelled as 10% w/w, what would be the molality and mole fraction of each component in the solution? If the density of solution is 1.2 g $mL^{-1}$, then what shall be the molarity of the solution?

36) Compare the general characteristics of the first series of the transition metals with those of the second and third columns. Give special emphasis on the following points:

(i) electronic configurations,

(ii) oxidation states,

(iii) ionisation enthalpies and

(iv) atomic sizes.

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37) Write the structure of the following compounds:

(i) 2-Chloro-3-methylpentane

(ii) 1-Chloro-4-ethylcyclohexane

(iii) 4-tert-Butyl-3-iodoheptane

(iv) 1,4-Dibromobut-2-ene

(v) 1-Bromo-4-butyl-2-methylbenzene.

38) (a) Define the following terms:

(i) Ideal solution

(ii) Azeotrope

(iii) Osmotic pressure

(b) A solution of glucose ($C_6H_{12}O_6$) in water is labelled as 10% by weight. What would be the molality of the solution?

(Molar mass of glugose = 180 g $mol^{-1}$)

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# RAVI TEST PAPERS WHATSAPP 8056206308

## 12TH CBSE CHEMISTRY PRACTICE TEST 3

**12th Standard**

**Chemistry**

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Multiple Choice Question 17 x 1 = 17

1) Formation of a solution from two components can be considered as
(i) pure solvent seperated solvent molecules, o
(ii) pure solute seperated solute molecules, [
(iii) separated solvent and solute molecules solution, ]
Solution so formed will be ideal if.
(a) ⟶ o 9 [ 9 ] (b) ⟶ o 9 [ ] (c) ⟶ o [ ]
(d) ⟶ ] o [

2) The molarity of a solution obtained by mixing 750 mL of 0.5 M HCI with 250 mL of 2 M HCI will be
(a) 0.975 M (b) 0.875 M (c) 1.00 M (d) 1.175 M

3) Which has the highest oxidizing power ?
(a) $I_2$ (b) $Br_2$ (c) $F_2$ (d) $Cl_2$

4) 1[A] vs time is a straight line. The order of the reaction is
(a) 1 (b) 2 (c) 3 (d) 0

5) The rate constant of a second order reaction, 2A Products, is $10^{-4}$ lit $mol^{-1}$ $min^{-1}$. The initial concentration of the reactant is $10^{-2}$ mol $lit^{-1}$. What is the half-life (in min) ?
(a) 10 (b) 1000 (c) 100 (d) $10^6$

6) $KMnO_4$ on heating to red hot gives
(a) $K_2MnO_4 + MnO_2 + O_2$ (b) $K_2MnO_3 + MnO_2 + O_2$ (c) $K_2O + MnO_2 + O_2$ (d) None of these

7) Which of the following statements are correct with reference to the ferrous and ferric ions ?
(a) $Fe^{3+}$ gives brown colour with potassium ferricyanide.
(b) $Fe^{2+}$ gives blue precipitate with potassium ferricyanide
(c) $Fe^{3+}$ gives red colour with potassium thiocyanate
(d) $Fe^{2+}$ gives brown colour with ammonium thiocyanate.

8) Which of the following configuration of ions has zero CFSE in both strong and weak ligand fields?
(a) $d^{10}$ (b) $d^8$ (c) $d^6$ (d) $d^4$

9) The correct increasing order of reactivity of halides for $S_N2$ reaction is
(a) $CH_3CH_2X < (CH3)_2CHX < CH_2 = CHCH_2X < PhCH_2X$
(b) $(CH_3)_2CHX < CH_3CH_2X < CH_2 = CHCH_2X < PhCH_2X$
(c) $PhCH_2X < (CH_3)_2CHX < CH_3CH_2X < CH_2 = CHCH_2X$
(d) $CH_2 = CHCH_2X < PhCH_2X < (CH_3)_2CHX < CH_3CH_2X$

10) Acid catalysed hydration of alkene is an example for
(a) free radical substitution (b) nucleophilic substitution (c) nucleophilic addition
(d) electrophilic addition (e) electrophilic substitution

11) The reagent used for separation of acetaldehyde and a acetophenone is
(a) $NaHSO_3$ (b) $C_6H_5NHNH_2$ (c) $NH_2OH$ (d) NaOH — $I_2$

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12) Which of the following reagents are used for detecting the presence of carbonyl group ?

(a) $NH_2OH$ (b) $NH_2NH_2$ (c) $H_2NCONHNH_2.HCl$ (d) $C_6H_5NHNH_2.HCl$

13) Which of the following will not show coupling reaction with benzenediazonium chloride?

(a) Aniline (b) Phenol (c) 2-Naphthol (d) Benzyl alcohol

14) The vitamins absorbed from intestine along with fats are

(a) A, D (b) A, B (c) A, C (d) D, B

15) Which of the following statements is correct ?

(a) All amino acids are optically active (b) All amino acids except glycine are optically active

(c) All amino acids except glutamic acid are optically active

(d) All amino acids except lysine are optically active

16) Which of the following is non-reducing sugar?

(a) Glucose (b) Sucrose (c) Maltose (d) Lactose

17) Curdling of milk is an example of

(a) breaking of peptide linkage (b) hydrolysis of lactose (c) breaking of protein into amino acids

(d) denaturation of protein

Assertion and reason 3 x 1 = 3

18) In the following questions. an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.

**Assertion (A)** The vapour pressure of 0.1M sugar solution is less than that of 0.1M potassium chloride solution.

**Reason (R)** Lowering of vapour pressure is directly proportional to the number of species present in the solution.

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

(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).

(c) (A) is correct; (R) is incorrect.

(d) (A) is incorrect; (R) is correct.

19) In the following questions.an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.

**Assertion (A)** 96500 C charge is required for the reduction of one mole of silver ions.

**Reason (R)** The amount of electricity (or charge) required for oxidation or reduction depends on. the stoichiometry of the electrode reaction.

**Codes:**

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

(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).

(c) (A) is correct; (R) is incorrect.

(d) (A) is incorrect; (R) is correct.

20) **Assertion :** The rate law equation can be found only by experiment.

**Reason :** It can be written from stoichiometric equation.

**Codes :**

(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.

2 Marks 5 x 2 = 10

21) Calculate the mass percentage of aspirin ($C_9H_8O_4$) in acetonitrile ($CH_3CN$) when 6.5 g of $C_9H_8O_4$ is dissolved in 450 g of $CH_3CN$.

22) Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.

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23) What is meant by hydroboration-oxidation reaction? Illustrate with an example.

24) How will you convert 4-nitrotoluene to 2-bromobenzoic acid?

25) Differentiate between globular and fibrous proteins

3 Marks 6 x 3 = 18

26) A solution of urea in water has a boiling point of 373.128 K. Calculate the freezing point of the same solution. [Given: For water, $K_f = 1.86\ Km^{-1}$, $K_b = 0.52\ Km^{-1}$]

27) A voltaic cell is setup at 25°C with the half celkls, $AI^{3+}$ (0.001 M) and $Ni^{2+}$ (0.50 M) Write an equation for the reaction that occurs when the cell generates an electric current and determine the cell potential. (Given $E^0_{Ni^{2+}/Ni} = 0.25V$, $E^0_{AI^{3+}/AI} = -1.66$ V)

28) For the decomposition of dinitrogen pentoxide at 200°C, $N_2O_5(g)$ $N_2O_5(g) + \frac{O}{[}O_2(g)$ if the initial pressure is 144mm after 25 minutes of the reaction, total pressure of the gaseous mixture is 133mm, calculate the average rate of reaction in (a) atm $min^{-1}$ (b) mol $L^{-1}s^{-1}$

29) Identify the first row transition metal ions which have outer electronic configurations of $3d^4$ and $3d^6$ and describe their oxidation states.

30) Name the following coordination entities and draw the structures of their entities and draw the structures of their streoisomers:
(i) $[Co(en)_2Cl_2]^+$ (en = ethane-1, 2-diamine)
(ii) $[Cr(C_2O_4)_3]^{3-}$
(iii) $[Co(NH_3)_3Cl_3]$
(Atomic numbers Cr = 24, Co = 27)

31) Chlorobenzene is extremely less reactive towards a nucleophilic substitution reaction. Give two reasons for the same.

Case Study Questions 3 x 4 = 12

32) **Read the passage given below and answer the following questions:**
The solubility of gases increases with increase of pressure. William Henry made a systematic investigation of the solubility of a gas in a liquid. According to Henry's law "the mass of a gas dissolved per unit volume of the solvent at constant temperature is directly proportional to the pressure of the gas in equilibrium with the solution".
Dalton during the same period also concluded independently that the solubility of a gas in a liquid solution depends upon the partial pressure of the gas. If we use the mole fraction of gas in the solution as a measure of its solubility, then Henry's law can be modified as "the partial pressure of the gas in the vapour phase is directly proportional to the mole fraction of the gas in the solution":
(i) Henry's law constant for the solubility of methane in benzene at 298 K is 4.27 X $10^5$ mm Hg. The solubility of methane in benzene at 298 K under 760 mm Hg is
**(a) $4.27 \times 10^{-5}$ (b) $1.78 \times 10^{-3}$**
**(c) $4.27 \times 10^{-3}$ (d) $1.78 \times 10^{-5}$**
(ii) The partial pressure of ethane over a saturated solution containing $6.56 \times 10^{-2}$ g of ethane is 1 bar. If the solution contains $5.00 \times 10^{-2}$ g of ethane then what will be the partial pressure (in bar) of the gas?
**(a) 0.762 (b) 1.312 (c) 3.81 (d) 5.0**
(iii) $K_H$ (K bar) values for $Ar_{(g)}$, $CO_{2(g)}$, $HCHO_{(g)}$ and $CH_{4(g)}$ are 40.39, 1.67, $1.83 \times 10^{-5}$ and 0.413 respectively.
Arrange these gases in the order of their increasing solubility.
3 4 — a — [ — 3 4 — [ — a —
3 4 — [ — a — 3 4 — a — [ —
(iv) Which of the following statements is correct
**(a) $K_H$ increases with increase of temperature**
**(b) $K_H$ decreases with increase of temperature**
**(c) $K_H$ remains constant with increase oftemperature**
**(d) $K_H$ first increases then decreases, with increase of temperature.**

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33) **Read the passage given below and answer the following questions :**

The potential of each electrode is known as electrode potential. Standard electrode potential is the potential when concentration of each species taking part in electrode reaction is unity and the reaction is taking place at 298 K. By convention, the standard ectrode potential of hydrogen (SHE) is 0.0 V. The electrode potential value for eacfi electrode process is a measure of relative tendency of the active species in the process to remain in the oxidisedlreduced form. The negative electrode potential means that the redox couple is stronger reducing agent than $H^+/H_2$ couple. A positive electrode potential means that the redox couple is a weaker reducing agent than the $H^+/H_2$ couple. Metals which have higher positive value of standard reduction potential form the oxides of greater thermal stability.

**In these questions (i-iv), a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.**

(i) **Assertion :** An electrochemical cell can be set-up only if the redox reaction is spontaneous.

**Reason :** A reaction is spontaneous if the free energy change is negative.

**(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.**

(ii) **Assertion :** The standard electrode potential of hydrogen is 0.0 V.

**Reason :** It is by convention.

**(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.**

**(iii) Assertion :** The negative value of standard reduction potential means that reduction takes place on this electrode with reference to hydrogen electrode.

**Reason :** The standard electrode potential of a half cell has a fixed value.

**(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.**

(iv) **Assertion :** The absolute value of electrode potential cannot be determined experimentally.

**Reason :** The electrode potential values are generally determined with respect to SHE.

**(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.**

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34) **Read the passage given below and answer the following questions :**

The half-life of a reaction is the time required for the concentration of reactant to decrease by half, i.e.,


$k \xrightarrow{\text{O}} k$

For first order reaction,

$\alpha[\xrightarrow{\text{HA}}]$ this means $t_{1/2}$ is independent of initial concentration. Figure shows that typical variation of concentration of reactant exhibiting first order kinetics. It may be noted that though the major portion of the first order kinetics may be over in a finite time, but the reaction will never cease as the concentration of reactant will be zero only at infinite time

**The following questions are multiple choice questions. Choose the most appropriate answer:**

(i) A first order reaction has a rate constant k = 3.01 x $10^{-3}$ is. How long it will take to decompose half of the reactant?

**(a) 2.303 s (b) 23.03 s (c) 230.3 s (d) 2303 s**

(ii) The rate constant for a first order reaction is 7.0x $10^{-4}$ $s^{-1}$. If initial concentration of reactant is 0.080 M, what is the half life of reaction?

**(a) 990 s (b) 79.2 s (c) 12375 s (d) 10.10 x $10^{-4}$ s**

(iii) For the half-life period of a first order reaction, which one of the following statements is generally false?

**(a) It is independent of initial concentration.**
**(b) It is independent of temperature.**
**(c) It decreases with the introduction of a catalyst**
**(d) None of these**

(iv) The rate of a first order reaction is 0.04 mol $L^{-1}$ $s^{-1}$ at 10 minutes and 0.03 mol $L^{-1}$ $s^{-1}$ at 20 minutes after initiation. The half-life of the reaction is

**(a) 4.408 min (b) 44.086 min (c) 24.086 min (d) 2.408 min**

5 Marks 4 x 5 = 20

35) A solution containing 30 g of non-volatile solute exactly in 90 g of water has a vapour pressure of 2.8 kPa at 298 K. Further, 18 g of water is then added to the solution, the new vapour pressure becomes 2.9 kPa at 298K. Calculate

(i) molar mass of the solute,

(ii) vapour pressure of water at 298K.

36) Using the standard electrode potentials, predict if the reaction between the following is feasible:

(i) $Fe^{3+}$(aq) and $I^-$(aq)

(ii) $Ag^+$(aq) and Cu(s)

(iii) $Fe^{3+}$(aq) and $Br^-$(aq)

(iv) Ag(s) and $Fe^{3+}$(aq)

(v) $Br_2$(aq) and $Fe^{2+}$(aq)

37) Show how each of the following compounds could be converted to benzoic acid

(i) Ethylbenzene

(ii) Acetophenone

(iii) Bromobenzene

(iv) Phenyethene (Styrene).

38) (a) Define the following terms:

(i) Mole fraction,

(ii) Ideal solution.

(b) 15.0 g of an unknown molecular material is dissolved in 450 g of water. The resulting solution freezes at - 0.34 C. What is the molar mass of the material? [$K_f$ for water=1.86 K Kg $mol^{-1}$]

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