05-12-15_Sr.IPLCO_Jee-Main_RPTM-13_ Syllabus

MATHS:

Trigonometry Upto Transformations, General Solutions, Heights And Distances

PHYSICS

E M I & AC : Magnetic flux calculation, Faraday's laws Lenz's law, Motional EMF, Induced electric filed ,Self and mutual induction, L-R,C-R,L-C-R circuits, L-C Oscillations with D-C source, LCR series circuit with AC , resonance: Quality factor, Power in AC circuits,Wattless current.AC generator and transformer

CHEMISTRY

Atomic Structure, Stoichiometry, Surface Chemistry

CHEMISTRY

31. Which of the following is incorrect?($\Delta X =$ uncertainty in the position, $\Delta P =$ uncertainty in the momentum, $\Delta V =$ uncertainty in the velocity, $\Delta E =$ uncertainty in the energy, $\Delta t =$ uncertainty in the time and $\Delta\lambda =$ uncertainty in the deBroglie's wavelength)

1) $\Delta X.\Delta p \geq \frac{h}{4\pi}$ 2) $\Delta X.\Delta V \geq \frac{\hbar}{2m}$

3) $\Delta E.\Delta t \geq \frac{h}{4\pi}$ 4) $\Delta X.\Delta\lambda \geq \frac{\lambda^2}{4\pi}$

32. What is the degeneracy of 4^{th} excited state in Li^+ ion?

1) Sixteen fold 2) three fold

3) five fold 4) twenty fifth fold

33. Which of the following element does not follow abnormal electronic configuration?

1) Ag 2) W 3) Pt 4) Ru

34. Which of the following is incorrect?
1) As n (principal quantum number) increases, energy of an electron in the orbit increases
2) As n decreases, deBroglie's wave length of an electron in Bohr's orbit increases
3) As n increases, orbit frequency decreases
4) As n decreases, velocity of electron in the orbit increases

35. Which of the following is incorrect?
1) $|\Psi^2|$ Represents probability density.
2) An atomic orbital wave function Ψ represents the state of an electron in an atom.
3) $\Psi_{3,2,0}$ represents $3d_{x^2-y^2}$ orbital
4) Number of maxima in radial distribution function verses 'r' curve is n-*l* for a given orbital

36. Which of the following expression is correct for energy of an electron in the n^{th} orbit of H-like species.
1) $\frac{-\pi\ me^2KZ^2}{2\varepsilon_0 n^2h^2}$
2) $\frac{-R_H ch.Z^2}{n^2}$ (R_H=Rydberg's constant for H-atom)
3) $\frac{-4\pi^2me^2K^2Z^2}{n^2h^2}$ (K=$\frac{1}{4\pi\varepsilon_0}$)
4) $\frac{-R_H c.Z^2}{n^2h^2}$ (R_H=Rydberg's constant for H-atom)

37. The second highest energy transition, when an electron jumps from sixth excited state to ground state in the single uni-positive Helium ion among the maximum number of possible electronic transitions is

1) $2 \rightarrow 1$ 2) $7 \rightarrow 1$ 3) $3 \rightarrow 2$ 4) $6 \rightarrow 1$

38. Identify the incorrect statement from the following data if the true value for a result is 2.00g.

	Experiment		
Student	1st time	2nd time	Average
A	1.95g	1.93g	1.94g
B	1.94g	2.05g	1.995g
C	2.01g	1.99g	2.00g

1) The values reported by student A are precise but not accurate.

2) The values reported by student B and C are accurate.

3) The values reported by student C are both precise and accurate.

4) The values reported by student A and C are accurate.

39. Which of the following is correct?

1) 1 mole of H_2SO_4 contains 2 gram atoms of Oxygen.

2) 1 mole of the molecules is also known as 1 gram molecule.

3) Mass of one Helium atom is 4g.

4) Mass of 1 mole of Oxygen gas is equal to mass of 2 equivalents of Oxygen gas.

40. Which of the following is correct for Molarity expression in terms various concentrations.

1) $M = \frac{m.1000.d\ (g/cc)}{100 + M.MW_{solute}}$

2) $M = N \times n - factor$

3) $M = \frac{10 \times \%(\frac{w}{V}) \times d\ (g/cc)}{MW_{solute}}$

4) $M = \frac{X_{solute}.1000.d\ (g/cc)}{X_{solvent}.MW_{solvent} + X_{solute}.MW_{solute}}$

41. 6 'g' of Hydro carbon on combustion in excess of oxygen produces 17.6 g of CO_2 and 10.8 g of H_2O. The data illustrate the law of

1) Definite proportions 2) Multiple proportions

3) Reciprocal proportions 4) Conservation of mass

42. The spin–only magnetic moment of a free ion is $\sqrt{8}$ B.M. The spin angular momentum of electron will be

1) $\sqrt{2}\frac{h}{2\pi}$ 2) $\sqrt{8}\frac{h}{2\pi}$ 3) $\sqrt{6}\frac{h}{2\pi}$ 4) $\sqrt{\frac{3}{4}}\frac{h}{2\pi}$

43. The mass numbers of three isotopes of an element are 10,12,14 units. Their percentage abundance is 80,15 and 5 respectively. What is the atomic weight of the element?

1) 10.5 2) 10.8 3) 10.2 4) 11

44. For 109% labelled oleum, if the number of moles of H_2SO_4 and free SO_3 be x and y respectively, then the value of $\frac{x+y}{x-y}$ is

1) 1.1 2) 5 3) 0.5 4) 10.1

45. Potassium tellurate is isomorphous with potassium sulphate and contains 45.52% Tellurium by weight. Which of the following is correct?

1) Oxidation state of Te in the given compound is +6
2) Atomic weight of Te is 118.6
3) Equivalent weight of potassiumTellurate is 130.
4) All the above

46. 20ml of 0.1M solution of compound $Na_2CO_3.NaHCO_3.2H_2O$ is titrated against 0.05M HCl, $x\,mL$ of HCl is used when phenolphthalein is used as an indicator and $y\,mL$ of HCl is used when methyl orange is the indicator in two separate titrations. Hence $(y-x)$ is

1) 40 mL 2)80 mL 3)120 mL 4)160 mL

47. 10 ml of H_2O_2 solution on treatment with acidified KI and titration of liberated I_2, required 10 ml of 1 N hypo. Thus H_2O_2 is :

1) 1 N 2) 5.6 volume 3) 17g L^{-1} 4) all are correct

48. 18 ml of 1.0M Br_2 solution undergoes complete disproportionation in basic medium to Br^- and BrO_3^-. Then the resulting solution is acidified, which requires 45 ml of As^{3+} solution to reduce BrO_3^- to Br^-. As^{3+} is oxidised to As^{5+}.Which of the statement is correct?

1) $Ew\left(Br_2\right)=\frac{MW}{10}$ 2) $Ew\left(Br_2\right)=\frac{5MW}{8}$

3) Molarity of $As^{3+}=0.4M$ 4) Molarity of $As^{3+}=0.2M$

49. Statement 1: The kinetic energy of the photo electron ejected increases with increase in intensity of incident light.

Statement 2: Increase in intensity of incident light increases the photoelectric current

1) Both Statement 1 and Statement 2 are true and Statement 2 is the correct explanation of Statement 1.

2) Both Statement 1 and Statement 2 are true and Statement 2 is not the correct explanation of Statement 1.

3) Statement 1 is true but Statement 2 is false.

4) Statement 1 is false but Statement 2 true.

50. On adding KI solution into $AgNO_3$ solution, a positively charged colloidal sol is obtained when they are in

1) $100\,ml\ of\ 0.1M\ AgNO_3 + 100\,ml\ of\ 0.1M\ KI$

2) $100\,ml\ of\ 0.1M\ AgNO_3 + 50\,ml\ of\ 0.2M\ KI$

3) $100\,ml\ of\ 0.1M\ AgNO_3 + 50\,ml\ of\ 0.1M\ KI$

4) $100\,ml\ of\ 0.1M\ AgNO_3 + 50\,ml\ of\ 0.25M\ KI$

51. Which of the following is correct property of hydrophilic sols?

1) Coagulation is irreversible.

2) Surface tension is higher than that of dispersion medium.

3) Viscosity is much lower than that of dispersion medium.

4) The charge on the particles depends on the pH value of medium; it may be positive, negative or even zero.

52. Which of the following is an incorrect statement?

1) enzymes are termed as biochemical catalyst

2) enzymes are highly specific in their reactions

3) π is the best colligative property to characterise the colloidal particles among the colligative properties

4) In a exothermic reversible reaction, a catalyst affects the forward reaction more than a backward reaction

53. Which of the following sol is not positively charged?

1) Methylene blue 2) Starch

3) $Al_2O_3.xH_2o$ 4) Haemoglobin

54. Which of the following is correct statement?

1) In adsorption initially entropy decreases then increases

2) Extent of physisorption increases with increasing surface area of adsorbent and decreasing pressure of gaseous adsorbate.

3) The $Mg(OH)_2$ precipitate exhibits blue colour in the presence of magneson reagent

4) Chromatographic analysis is based on the phenomenon of absorption

55. $CO(g)$ Combines with $H_2(g)$ in the presence of Ni catalyst to from

1) CH_4 2) C_2H_6 3) CH_3OH 4) $HCHO$

56. Among the following incorrect statement is

1) Micellization is phase change process

2) Micellization of soap is endothermic process

3) In the micellization of soap entropy decreases

4) As number of carbons increases in the alkyl group of surfactant, its C.M.C decreases

57. The incorrect statement is?

1) Greater electro kinetic potential represents lesser stability to the lyophobic sol

2) The refractive indices of the dispersed phase and the dispersion medium differ greatly in magnitude to observe Tyndall effect.

3) Butter and cream are examples of $^{W}/_{O}$ type emulsions

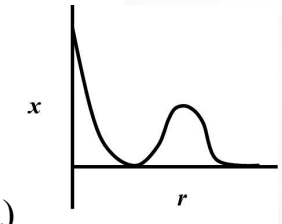
4) The diameter of the dispersed particles is not much smaller than the wavelength of the light used to observe Tyndall effect.

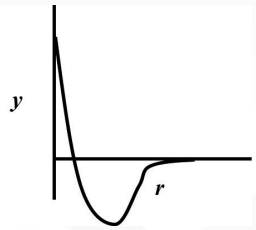
58. Which of the following is true in respect of chemical adsorption?

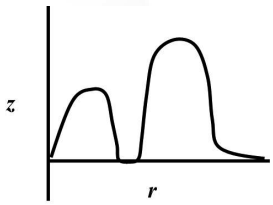
1) $\Delta H < 0, \Delta S > 0, \Delta G > 0$ 2) $\Delta H < 0, \Delta S < 0, \Delta G < 0$

3) $\Delta H > 0, \Delta S > 0, \Delta G < 0$ 4) $\Delta H > 0, \Delta S < 0, \Delta G > 0$

59. Consider the following plots for 2s - orbital:

a) 

b) 

c) 

x, y and z are respectively

1) Ψ, Ψ^2 and $4\pi r^2\Psi^2$ 2) Ψ^2, Ψ and $4\pi r^2\Psi^2$

3) $4\pi r^2\Psi^2$ and Ψ^2, Ψ 4) Ψ^2, $4\pi r^2\Psi^2$ and Ψ

60. On the addition of 5mL of 20% NaCl solution to 400 mL of standard gold sol in the presence of 0.96 gm of starch, the coagulation is prevented. The gold number of starch is.

1) 2.4 2) 7.6 3) 240 4) 24