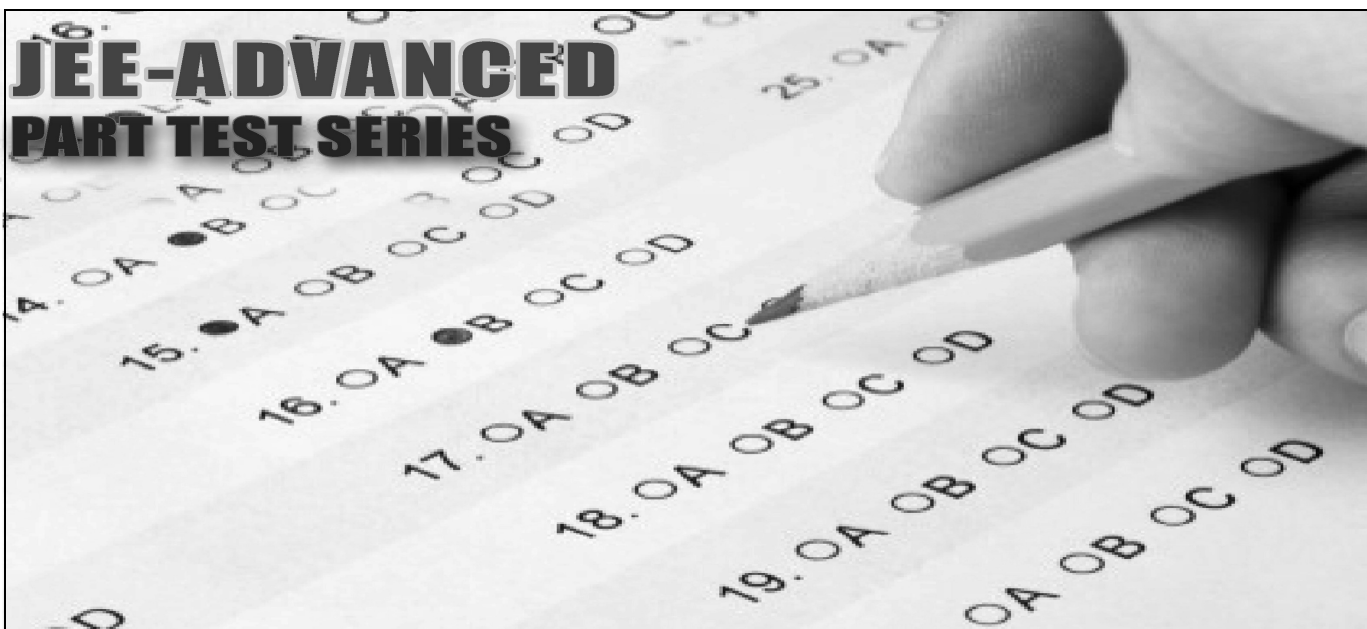# JEE-ADVANCED
PART TEST SERIES

RPTA-16

Sri Chaitanya IIT Academy, India

A.P, TELANGANA, KARNATAKA, TAMILNADU, MAHARASHTRA, DELHI, RANCHI

A right Choice for the Real Aspirant

ICON CENTRAL OFFICE, MADHAPUR-HYD

Sec: Sr.IPLCO	**Dt: 27-12-15**
Time: 09:00 AM to 12:00 Noon	**Max.Marks: 180**

Name of the Student: _____   I.D. NO: ☐☐☐☐☐☐☐

PAPER-I

27-12-15_Sr.IPLCO_RPTA-16_Weekend Syllabus

MATHS:

Probability :addition and multiplication rules of probability, conditional probability, bayes theorem, independence of events, computation of probability of events using permutations and combinations.

PHYSICS:

Modern Physics : Atomic nucleus; alpha, beta and gamma radiations; law of

radioactive decay; decay constant; half-life and mean life; binding energy and its

calculation; fission and fusion processes; energy calculation in these processes.

Photoelectric effect; bohr's theory of hydrogen-like atoms; characteristic and continuous x-rays, moseley's law; de broglie wavelength of matter waves
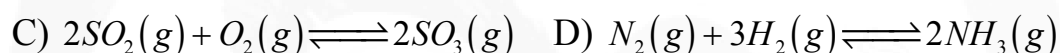
CHEMISTRY:

Chemical Equilibrium and Ionic Equilibrium

PART-II_CHEMISTRY 　　　　　　　　　　　　　　　　　　　**Max Marks : 60**

Section-1
(One or More options Correct Type)

This section contains 10 multiple choice equations. Each question has four choices (**A**) (**B**)(**C**) and (**D**) out of which **ONE or MORE** are correct.

21. In which of the following reactions, the yield of the products increase by the increase in the pressure?

　　A) $PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$ 　　　　B) $N_2(g) + O_2(g) \rightleftharpoons 2NO(g$

　　C) $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$ 　　D) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

22. The equilibrium concentration of C_2H_4 in the gas phase reaction

　　$C_2H_4(g) + H_2(g) \rightleftharpoons C_2H_6(g); \Delta H = -32.7 kcal;$ can be increased by
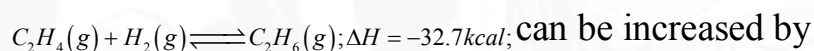
　　I. removal of C_2H_6 　　　　　　　　II. Addition of H_2
　　III. Decreasing temperature 　　　　IV. Increasing pressure
　　The correct choice is:

　　A) I,II 　　　　　B) I,III 　　　　　C) II,III 　　　　　D) None of these

23. Degree of hydrolysis for a salt of strong acid and weak base is
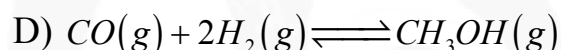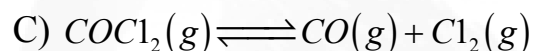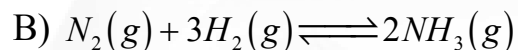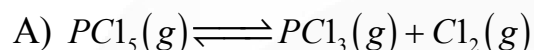
　　A) independent of dilution

　　B) increases with dilution

　　C) decrease with dilution

　　D) decreases with decrease in temperature

24. In which of the following reactions, the system will shift towards forward reaction by adding inert gas at constant pressure?

A) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$

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

C) $COCl_2(g) \rightleftharpoons CO(g) + Cl_2(g)$

D) $CO(g) + 2H_2(g) \rightleftharpoons CH_3OH(g)$

25. A solution containing a mixture of 0.05 M $NaCl$ and 0.05 M NaI is taken. $\left(K_{sp} \, of \, AgCl = 10^{-10} M^2 \, and \, K_{sp} of \, AgI = 4 \times 10^{-16} M^2 \right)$. When $AgNO_3$ is added to such a solution.

A) the concentration of Ag^+ required to precipitate Cl^- is $2 \times 10^{-9} mol / L$

B) the concentration of Ag^+ required to precipitate I^- is $8 \times 10^{-15} mol / L$

C) $AgCl$ and AgI will precipitate together at first

D) first AgI will be precipitated

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26. Which of the following is (are) correct for buffer solution?

A) Acidic buffer will be effective within the pH range$(pK_a \pm 1)$

B) Basic buffer will be effective within the pH range $(pK_w - pK_b \pm 1)$

C) $H_3PO_4 + NaH_2PO_4$ is not a buffer solution

D) Buffer behaves most effectively when the [Salt]/[Acid] ratio equal one

27. Which of the following is (are) correct when 0.1 L of 0.0015 M $MgCl_2$ and

0.1 L of 0.025 M NaF are mixed together? $\left(K_{sp} of\ MgF_2 = 3.7 \times 10^{-8} M^3\right)$

A) MgF_2 remains in solution   B) MgF_2 precipitates out

C) $MgCl_2$ precipitates out   D) Cl^- ions remain in solution

28. Choose the correct statement

A) pH of acidic buffer solution decreases if more salt is added

B) pH of acidic buffer solution increases if more salt is added

C) pH of basic buffer decreases if more salt is added

D) pH of basic buffer increases if more salt is added

29. pH of water is 7. When a substance Y is dissolved in water, the pH becomes 11.

 The substances Y is a salt of :

 A) weak acid and weak base   B) strong acid and strong base

 C) strong acid and weak base   D) weak acid and strong base

30. In H_3PO_4, which of the following is true?

 A) $K_a = K_{a1} \times K_{a2} \times K_{a3}$ B) $K_{a1} < K_{a2} < K_{a3}$

 C) $K_{a1} > K_{a2} > K_{a3}$ D) $K_{a1} = K_{a2} = K_{a3}$

Section-2
(Integer Value Correct Type)

This section contains 10 questions. The answer to each question is a **single digit integer, ranging** from 0 to 9 (both inclusive).

31. 500 ml of 0.2 M aqueous solution of acetic acid is mixed with 500 ml of 0.2 M

 HCl at 25^0 C, After this mixing 6g of $NaOH$ is added to the above solution.

 If resulting $\left[H^{+1}\right] = x \times 10^{-5} M$, find x.

 $$\left[K_{a\,acetic\,acid} = 2 \times 10^{-5} M\right]$$

32. If the solubility of $AgCN$ in a buffer solution maintained at pH=3 is

 $1.82 \times 10^{-x} M$, find x ?

 $K_{sp}(AgCN) = 2.0 \times 10^{-16} M^2; K_a(HCN) = 6.0 \times 10^{-10} M^2$

33. The solubility product of $Ag_2C_2O_4$ at 25^0C is $1.20 \times 10^{-11} M^3$. A solution of $K_2C_2O_4$ containing 0.15 moles in $500 ml$ water is mixed with excess of Ag_2CO_3 till the following equilibrium is established:

$$Ag_2CO_3 + K_2C_2O_4 \rightleftharpoons Ag_2C_2O_4 + K_2CO_3$$
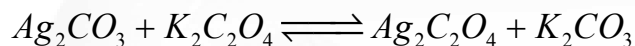
At equilibrium, the solution contains 0.03 mole of K_2CO_3. Assuming that the degree of dissociation of $K_2C_2O_4$ and K_2CO_3 to be equal, if the solubility product of Ag_2CO_3 is $y \times 10^{-12} M^3$. find the value of y? [Take 100% ionization of $K_2C_2O_4$ and K_2CO_3]

34. The concentration of Ni^{2+} ions in a given NiS solution is 2.0×10^{-6} moles/L. If the minimum S^{2-} ions necessary to cause precipitation of NiS is $7 \times 10^{-Z} M$. Find Z , K_{sp} of NiS $= 1.4 \times 10^{-14} M^2$

35. A mixture contains aniline and acetic acid each of them being 0.01 M in it. K_a of acetic acid $= 1.8 \times 10^{-5} M^2$ and K_b(aniline)$= 4.5 \times 10^{-10} M^2$. If $\left[H^+\right] = 2 \times 10^{-x} M$ in the mixture, calculate x?

36. The equivalence point in a titration of 40.0 ml of a solution of a a weak monoprotic acid occurs when 35.0 mL of a 0.01 M $NaOH$ solution has been added. The pH of the solution is 5.5 after the addition of 20.0 mL of $NaOH$ solution. If the dissociation constant of the acid is 4.22×10^{-X}, find X?

37. 40% of a mixture of 0.2 mol of N_2 and 0.6 mol of H_2 react to give NH_3 according to the equation;

$$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$$
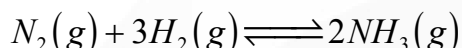
At constant temperature and pressure. Then if the minimum integer ratio of the final volume to the initial volume of gases is X:Y. Find value of (Y-X)?

38. For a reversible reaction: $A + B \rightleftharpoons C$

$$\left(\frac{dx}{dt}\right) = 2.0 \times 10^3 \, L\,mol^{-1}s^{-1}[A][B] - 1.0 \times 10^2 \, s^{-1}[C]$$

Where x is the amount of 'A' dissociated. Then if the value of equilibrium constant (K_{eq}) is $10y$. Find y?

39. The degree of dissociation of I_2 molecule at $1000^0\,C$ and under 1.0 atmospheric pressure is 40% by volume. If the dissociation is reduced to 20% at the same temperature, then if the total equilibrium pressure on the gas is 4.57×10^x. Find x?

40. The value of K_c for the reaction: $A_2(g) + B_2(g) \rightleftharpoons 2AB(g)$ at 100^0 is 49. If 1.0 L flask containing one mole of A_2 is connected with a 2.0 L flask containing one mole of B_2, then if moles of AB formed at $100^0 C$ are 15.6×10^{-y}. Find y?