Q1 - 24 June - Shift 1

Given below are two statements :

Statement I : Emulsions of oil in water are unstable and sometimes they separate into two layers on standing.

Statement II :For stabilisation of an emulsion, excess of electrolyte is added.

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

(A) Both Statement I and Statement II are correct.

(B) Both Statement I and Statement II are incorrect.

(C) Statement I is correct but Statement II is incorrect.

(D) Statement I is incorrect but Statement II is correct.

Space for your notes:

Q2 - 24 June - Shift 2

When 200 mL of 0.2 M acetic acid is shaken with 0.6 g of wood charcoal, the final concentration of acetic after adsorption is 0.1 M. The mass of acetic acid adsorbed per garm of carbon is_____ g.

Space for your notes:

Q3 - 25 June - Shift 1

Incorrect statement for Tyndall effect is :-

(A) The refractive indices of the dispersed phase and the dispersion medium differ greatly in magnitude.

(B) The diameter of the dispersed particles is much smaller than the wavelength of the light used.

(C) During projection of movies in the cinemas hall, Tyndall effect is noticed.

(D) It is used to distinguish a true solution from a colloidal solution.

Space for your notes:

Q4 - 26 June - Shift 1

2.0 g of H_2 gas is adsorbed on 2.5 g of platinum powder at 300 K and 1 bar pressure. The volume of the gas adsorbed per gram of the adsorbent is _____ mL.

(Given : R = 0.083 L bar K^{-1} mol^{-1})

Space for your notes:

Q5 - 27 June - Shift 1

Match List-I with List-II

List-I	List-II
(A) Lyophilic colloid	(I) Liquid-liquid colloid
(B) Emulsion	(II) protective colloid
(C) Positively charged	(III) $FeCl_3$ + NaOH
(D) Negatively charged colloid	(IV) $FeCl_3$ + hot water

Choose the correct answer from the options given below:

(A) (A) – (II), (B) – (I), (C) – (IV), (D) – (III)

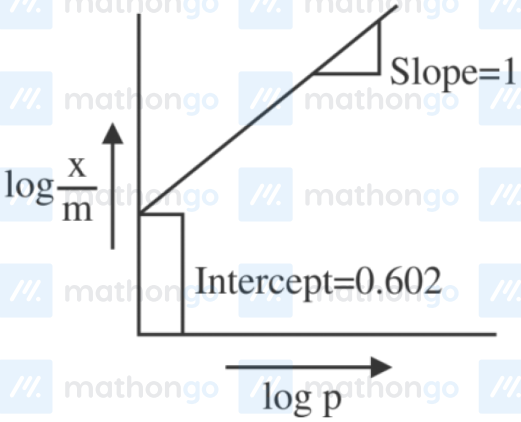
(B) (A) – (III), (B) – (I), (C) – (IV), (D) – (II)

(C) (A) – (II), (B) – (I), (C) – (III), (D) – (IV)

(D) (A) – (III), (B) – (II), (C) – (I), (D) – (IV)

Space for your notes:

Q6 - 27 June - Shift 2



If the initial pressure of a gas is 0.03 atm, the mass of the gas adsorbed per gram of the adsorbent is _____ $\times 10^{-2}$g.

Space for your notes:

Q7 - 28 June - Shift 1

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The Zeta potential is related to which property of colloids"

(A) Colour

(B) Tyndall effect

(C) Charge on the surface of colloidal particles

(D) Brownian movement

Space for your notes:

Q8 - 28 June - Shift 2

Match List-I with List-II.

Space for your notes:

List-I		List-II	
(A)	Negatively charged sol	(I)	$Fe_2O_3 \cdot xH_2O$
(B)	Macromolecular colloid	(II)	CdS sol
(C)	Positively charged sol	(III)	Starch
(D)	Cheese	(IV)	a gel

Choose the correct answer from the options given below :

(A) (A) – (II), (B) – (III), (C) – (IV), (D) – (I)

(B) (A) – (II), (B) – (I), (C) – (III), (D) – (IV)

(C) (A) – (II), (B) – (III), (C) – (I), (D) – (IV)

(D) (A) – (I), (B) – (III), (C) – (II), (D) – (IV)

Q9 - 29 June - Shift 1

Which of the following is a **correct** statement ?

(A) Brownian motion destabilises sols.

(B) Any amount of dispersed phase can be added to emulsion without destabilising it.

(C) Mixing two oppositely charged sols in equal amount neutralises charges and stabilises colloids.

(D) Presence of equal and similar charges on colloidal particles provides stability to the colloidal solution.

Space for your notes:

Q10 - 29 June - Shift 2

A 42.12% (w/v) solution of NaCl causes precipitation of a certain sol in 10 hours. The coagulating value of NaCl for the sol is

[Given : Molar mass : Na = 23.0 g mol^{-1}; Cl = 35.5 g mol^{-1}]

(A) 36 mmol L^{-1}

(B) 36 mol L^{-1}

(C) 1440 mol L^{-1}

(D) 1440 mmol L^{-1}

Space for your notes:

Answer Key

Q1 (C) **Q2** (2) **Q3** (B) **Q4** (9960)

Q5 (A) **Q6** (12) **Q7** (C) **Q8** (C)

Q9 (D) **Q10** (D)

Q1 (C)

Statement I : Fact

Statement II: The principle emulsifying agents for O/W emulsions are proteins, gums natural and synthetic soaps etc…

Q2 (2)

weight of wood charcoal = 0.6 g

$$\text{Mass of acetic acid adsorbed} = \frac{M_1V_1 - M_2V_2}{1000} \times 60$$

$$= \frac{0.2 \times 200 - 0.1 \times 200}{1000} \times 60$$

= 1.2 g

Mass of acetic acid adsorbed per gram of

$$\text{carbon} = \frac{1.2}{0.6} = 2$$

Q3 (B)

The diameter of dispersed particle should be somewhat below or near the wavelength of light.

Q4 (9960)

$$\text{Volume of } H_2 = \frac{nRT}{p} = \frac{2}{2} \times \frac{0.083 \times 300}{1}$$

= 24.92

= 24900 mL

$$\text{So 'g platinum adsorb} = \frac{24900}{2.5} mLH_2$$

= 9960

Q5 (A)

(A) Protective colloids are lyophilic colloids

(B) Emulsions are liquid in liquid colloidal solutions

(C) $FeCl_3$ + hot water forms positively charged colloidal solution of hydrated ferric oxide.

(D) $FeCl_3$ + NaOH forms negatively charged colloidal solution due to preferential adsorption of OH^- ions

Q6 (12)

$$\frac{x}{m} = kP^{\frac{1}{n}}$$

$$\log\frac{x}{m} = \log k + \frac{1}{n}\log P$$

From graph

$$\text{Slope} = \frac{1}{n} = 1 \Rightarrow n = 1$$

$$\text{Intercept} = \log k = 0.602$$

$$k = 4$$

$$\frac{x}{m} = 4 \times (0.03)^{\frac{1}{1}}$$

$$\frac{x}{m} = 12 \times 10^{-2}$$

Q7 (C)

The potential difference between the fixed and diffused layer of charges in a colloidal particle is called zeta potential

Q8 (C)

Negative charged sol = CdS (II)

Macromolecular colloid = starch (III)

Positively charged sol = $Fe_2O_3.xH_2O$ (I)

Cheese = gel (IV)

Q9 (D)

As equal & similar charge particle will repel each other, hence will never precipitate.

Q10 (D)

Data insufficient.