Q1 - 24 January - Shift 1

Statement I : For colloidal particles, the values of colligative properties are of small order as compared to values shown by true solutions at same concentration.

Statement II : For colloidal particles, the potential difference between the fixed layer and the diffused layer of same charges is called the electrokinetic potential or zeta potential.

In the light of the above statements, choose the **correct** answer from the options given below.

(1) Statement I is true but Statement II is false

(2) Statement I is false but Statement II is true

(3) Both Statement I and Statement II are true

(4) Both Statement I and Statement II are false

Space for your notes:

Q2 - 24 January - Shift 2

The number of statement/s which are the characteristics of physisorption is _____.

A. It is highly specific in nature

B. Enthalpy of adsorption is high

C. It decreases with increase in temperature

D. It results into unimolecular layer

E. No activation energy is needed

Space for your notes:

Q3 - 25 January - Shift 2

The number of **incorrect** statement/s from the following is/are _____

A. Water vapours are adsorbed by anhydrous calcium chloride.

B. There is a decrease in surface energy during adsorption.

C. As the adsorption proceeds, ΔH becomes more and more negative.

D. Adsorption is accompanied by decrease in

Space for your notes:

Q4 - 29 January - Shift 1

Which of the following salt solutions would coagulate the colloid soloution formed when $FeCl_3$ is added to NaOH solution, at the fastest rate?

(1) 10 mL of 0.2 mol dm^{-3} $AlCl_3$

(2) 10 mL of 0.1 mol dm^{-3} Na_2SO_4

(3) 10 mL of 0.1 mol dm^{-3} $Ca_3(PO_4)_2$

(4) 10 mL of 0.15 mol dm^{-3} $CaCl_2$

Space for your notes:

Q5 - 30 January - Shift 1

Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R).**

Assertion (A) : In expensive scientific instruments, silica gel is kept in watch-glasses or in semipermeable membrane bags.

Reason (R) : Silica gel adsorbs moisture from air via adsorption, thus protects the instrument from water corrosion (rusting) and / or prevents malfunctioning.

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

(1) (A) is false but (R) is true

(2) (A) is true but (R) is false

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

(4) Both (A) and (R) are true but (R) is not the correct explanation of (A)

Space for your notes:

Q6 - 30 January - Shift 2

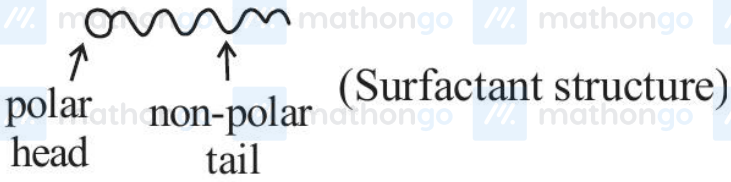
The graph of $\log\frac{x}{m}$ vs $\log p$ for an adsorption process is a straight line inclined at an angle of 45° with intercept equal to 0.6020. The mass of gas adsorbed per unit mass of adsorbent at the pressure of 0.4 atm is _____ $\times 10^{-1}$ (Nearest integer)

Given : $\log 2 = 0.3010$

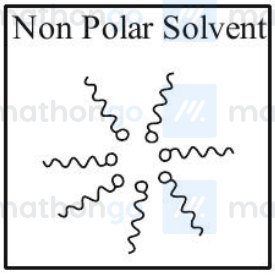
Space for your notes:

Q7 - 31 January - Shift 1

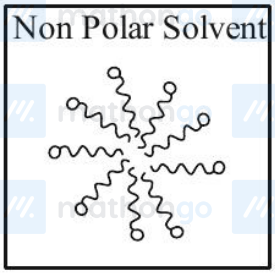
Adding surfactants in non polar solvent, the micelles structure will look like



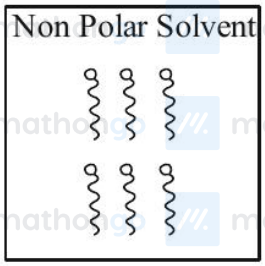
(a)



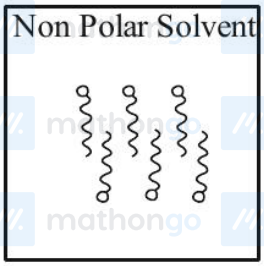
(b)



(c)



(d)



(1) b
(2) c
(3) a
(4) d

Space for your notes:

Q8 - 01 February - Shift 1

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

Assertion A: Amongst He, Ne, Ar and Kr;
1 g of activated charcoal adsorbs more of Kr.

Reason R : The critical volume V_c ($cm^3\ mol^{-1}$) and critical pressure P_c (atm) is highest for Krypton but the compressibility factor at critical point Z_c is lowest for Krypton.

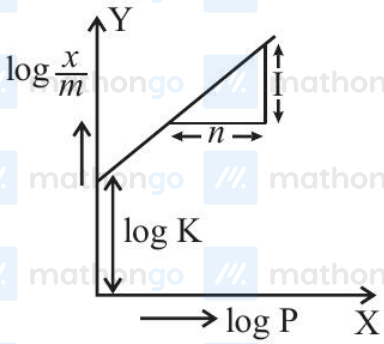
In the light of the above statements, choose the **correct** answer from the options given below.

(1) A is true but R is false
(2) A is false but R is true
(3) Both A and R are true but R is NOT the correct explanation of A
(4) Both A and R are true and R is the correct explanation A

Space for your notes:

Q9 - 01 February - Shift 2

igure, a straight line is given for Freundrich Adsorption ($y = 3x + 2.505$). The value of $\frac{1}{n}$ and log K are respectively.



(1) 0.3 and log 2.505 (2) 0.3 and 0.7033
(3) 3 and 2.505 (4) 3 and 0.7033

Space for your notes:

Answer Key

(As per Official NTA Key released on 2 Feb)

Q1 (3)	**Q2** (2)	**Q3** (2)	**Q4** (1)
Q5 (3)	**Q6** (16)	**Q7** (3)	**Q8** (1)
Q9 (3)			

Q1 (3)

Statement I : For colloidal particles, the values of colligative properties are of small order as compared to values shown by true solutions at same concentration. : True

Statement II : For colloidal particles, the potential difference between the fixed layer and the diffused layer of same charges is called the electrokinetic potential or zeta potential. : True

Q2 (2)

For physisorptions

(a)Decreases with increase in temperature
(b)No appreciable activation energy is required

Q3 (2)

'A' water vapours are absorbed by calcium chloride.

C. As the adsorption proceeds, ΔH becomes less and less negative.

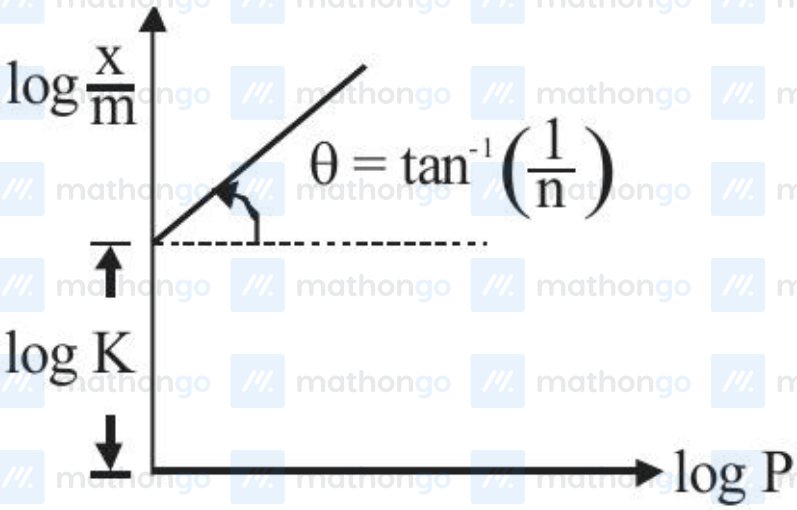
Q4 (1)

Sol. Formed is negatively charged solution, therefore Al^{3+} has highest coagulating power

Q5 (3)

Silica gel prevents water corrosion (rusting) and instrument malfunction by adsorbing moisture from the air.

Q6 (16)



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

$$\frac{1}{n}=\tan 45^\circ=1$$

$$\log k=0.6020=\log 4$$

$$\Rightarrow K=4$$

$$\therefore \frac{x}{m}=K.P^{1/n}$$

$$\frac{x}{m}=4(0.4)=1.6$$

$$\frac{x}{m}=1.6=16\times 10^{-1}$$

Q7 (3)

Non-Polar tail towards non-polar solvent

Ans. 3

Q8 (1)

Adsorption $\propto$ vanderwaal attraction forces

$Z_c = \frac{3}{8}$ for all real gases

Q9 (3)

$$\frac{x}{m} = Kp^{1/n}$$

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

$$Y = 3x + 2.505,\ \frac{1}{n} = 3\ ,\ \log K = 2.505)$$