

# QUESTIONS & ANSWERS

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**Medical**

# BMAT

*Biomedical Admissions Test*

**Question: 58**

A colloid made from a liquid dispersing medium and gas dispersed phase is called what?

- A. Aerosol
- B. Emulsion
- C. Sol
- D. Solid Foam
- E. Foam

**Answer: E**

Foams are colloids with a liquid dispersing medium and a gas dispersed phase. An aerosol has a gas dispersing medium and dispersed phase. An emulsion has a liquid dispersing medium and dispersed phase. A sol has a liquid dispersing medium and a solid dispersed phase. A solid foam has a solid dispersed medium and a gas dispersed phase.

**Question: 59**

Which of the following is not true about complex ions?

- A. Complex ions are formed with a metal as the central atom
- B. The other molecules that bond to the metal are called ligands
- C. Ligands act as Lewis Acids
- D. The coordination number of a complex ion refers to the number of bonds the center atom forms
- E. All of the above are true

**Answer: C**

Ligands, the compounds that bind to the central metal atom, always act as Lewis Bases. Lewis Bases donate lone pairs of electrons to the Lewis Acid (the metal ion). All other statements are true.

**Question:** 60

A fixed quantity of a gas undergoes a change in temperature from 100 K to 200 K and a change in pressure from 2 atm to 1 atm. After these changes, the volume of the gas is

- A. Half of the original volume
- B. Unchanged
- C. Twice the original volume
- D. Four times the original volume
- E. Eight times the original volume

**Answer:** D

The pressure, temperature, and volume of a gas are related by the ideal gas law,  $PV=nRT$ . Solving for volume gives the equation  $V=(nRT/P)$ . The molar quantity of gas ( $n$ ) is constant, so the equation reduces to  $V=T/P$ . In the context of the question, temperature is doubled while pressure is halved, resulting in a four-fold increase in volume.

**Question:** 61

When sodium acetate,  $\text{NaCH}_3\text{COO}$ , is added to water the resulting solution is basic. True or false?

- A. True
- B. False

**Answer:** A

The statement is true. In water,  $\text{NaCH}_3\text{COO}$  forms  $\text{Na}^+$  and  $\text{CH}_3\text{COO}^-$  ions.  $\text{Na}^+$  is neutral, and does not affect the pH of the solution.  $\text{CH}_3\text{COO}^-$  is the conjugate base of acetic acid, and reacts with water to form hydroxide ions. Therefore, the resulting solution will be basic.

**Question: 62**

What do the letters in the S-T-A-R method of communication stand for?

- A. Standard Target Acquisition Review
- B. Situation, task, action, result
- C. Start, train, act, review
- D. Say it, try it, act on it, review it
- E. They don't actually stand for anything.

**Answer: B**

STAR stands for situation, task, action, result. S - Explain the situation. T - Describe the task that needed to be completed. A - What action did you take? R - Describe the result. For example: "I was brought in to lead a \$1.5 million project that was failing and management didn't understand why. My task was to bring the project back on schedule. To do this, I analyzed why the project had fallen behind schedule and discovered the team was in a matrixed organization and the operational processes were taking precedence over this project. To solve the problem, I worked with functional managers to free up time for key resources. The result was that we got the project turned around and delivered on schedule. Furthermore, we won an additional \$500,000 contract because the client went from being dissatisfied to very happy." Key Takeaway: STAR is an effective technique to deliver a cohesive narrative of what you are doing or have done Master it and you will win points in interviews and with senior managers. Have at least 10 of these scenarios prepared. Try not to re-use any in one given day, no matter how many interviews you have. At the end, people get together and compare notes. Plus, in many cases, that perfect example you have won't fit the question that is asked. If someone asks you about a time you managed a team through adversity, you can't use your story about how you singlehandedly increased earnings 20 percent while saving the CEO's grandmother from a burning house.

**Question: 63**

A princess who is severely allergic to certain frogs is confronted with the possibility that her prince may be a frog. There are 3 frogs in front of her. She's

not sure she'll be allergic to the frog until she kisses it. One frog is definitely safe to kiss. Should she kiss a frog and risk death?

- A. Yes
- B. No
- C. Maybe

**Answer: C**

Maybe is the best choice here. This is a somewhat absurd question, but it's one an editor had in an interview. It is designed throw you off. The question is at the end of the day about risk. Businesses must take risks to succeed. Princesses may have to in order to find their Prince Charming. Key Takeaway: The interviewer is really asking you to analyze the risk and determine if it is worth it. This is an easy question if you do not panic. Maybe a quick Q&A could lead to an answer here, or you can propose something out of the box to manage this risk, like a big box of Benadryl.

**Question: 64**

How many molecules are in .275 grams of SO<sub>3</sub>?

- A.  $3.22 \times 10^{20}$
- B.  $4.50 \times 10^{21}$
- C.  $2.07 \times 10^{21}$
- D.  $1.12 \times 10^{20}$
- E.  $4.56 \times 10^{22}$

**Answer: C**

Begin this problem by converting grams of SO<sub>3</sub> to moles of SO<sub>3</sub> using the molar mass of SO<sub>3</sub>. Once you have obtained this value, use Avogadro's number to convert moles of SO<sub>3</sub> to molecules of SO<sub>3</sub>. The final expression is  $(.275 \text{ grams SO}_3) \times (1 \text{ mol} / 80.057 \text{ grams}) \times (6.022 \times 10^{23} \text{ molecules} / 1 \text{ mol})$ , indicating that the correct answer is  $2.07 \times 10^{21}$ .

**Question: 65**

What volume of .250 M potassium hydroxide is needed to neutralize 1.25 liters of .500 M hydrochloric acid?

- A. 2.50 liters
- B. 1.25 liters
- C. .625 liters
- D. .375 liters
- E. 5.0 liters

**Answer:** A

Hydrochloric acid (HCl) is a strong, monoprotic acid. Potassium hydroxide (KOH) is a strong base that contains one hydroxide anion per molecule. The concentrations and volumes of these solutions are related by the formula  $(\text{Molarity}_1)(\text{Volume}_1) = (\text{Molarity}_2)(\text{Volume}_2)$ . Entering the variables into this equation gives  $(.250 \text{ M})(\text{Volume}_1) = (.500 \text{ M})(1.25 \text{ liters})$ . Solve for Volume1 to find the correct answer, 2.5 liters.

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