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## **IB Chemistry: SL**

### **8.1 Theories & Reactions of Acids & Bases**



# **CHEMISTRY**

# **SL**

## 8.1 Theories & Reactions of Acids & Bases

### Question Paper

Course	DP IB Chemistry
Section	8. Acids & Bases
Topic	8.1 Theories & Reactions of Acids & Bases
Difficulty	Hard

Time allowed: 20

Score: /10

Percentage: /100

## Question 1

Which of the following substances can be used to prepare magnesium sulfate by a neutralization reaction with dilute sulfuric acid?

- I. Mg
  - II. MgO
  - III.  $\text{MgCO}_3$
- 
- A. I and II only
  - B. I and III only
  - C. II and III only
  - D. I, II and III

[1 mark]

## Question 2

Phosphoric acid is a **polyprotic** acid and can produce amphiprotic species when it dissociates. Which of the following species is amphiprotic?

- I.  $\text{HPO}_4^{2-}$
  - II.  $\text{H}_2\text{PO}_4^-$
  - III.  $\text{PO}_4^{3-}$
- 
- A. I and II only
  - B. I and III only
  - C. II and III only
  - D. I, II and III

[1 mark]

### Question 3

Some species may be classified as amphiprotic, some as amphoteric and some as both. Which of the following applies to  $\text{HPO}_4^{2-}$  ?

- A. Amphiprotic but not amphoteric
- B. Amphoteric but not amphiprotic
- C. Amphiprotic and amphoteric
- D. Neither amphiprotic nor amphoteric

[1 mark]

### Question 4

The aromatic compound phenol,  $\text{C}_6\text{H}_5\text{OH}$ , behaves as a weak acid, due the presence of a hydroxyl group on the benzene ring. What is the correct formula of the conjugate base formed when phenol dissociates?

- A.  $\text{C}_6\text{H}_4^- - \text{OH}$
- B.  $\text{C}_6\text{H}_5 - \text{OH}_2^+$
- C.  $\text{C}_6\text{H}_5 - \text{O}^-$
- D.  $\text{C}_6\text{H}_6^+ - \text{OH}$

[1 mark]

### Question 5

What is the sum of the coefficients when the following acid-base equation is balanced?



- A. 6
- B. 7
- C. 14
- D. 15

[1 mark]

## Question 6

Which substance reacts with ammonia but is not a Brønsted–Lowry acid?

- A. HCl
- B. CH<sub>3</sub>COOH
- C. BF<sub>3</sub>
- D. CF<sub>3</sub>COOH

[1 mark]

## Question 7

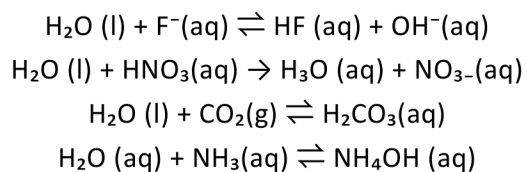
Which row shows the correct systematic name of the acid?

	Formula	Name
A	HClO <sub>3</sub>	chloric(V) acid
B	H <sub>2</sub> SO <sub>3</sub>	hydrogensulfate(VI) acid
C	H <sub>3</sub> PO <sub>3</sub>	phosphoric(V) acid
D	HNO <sub>2</sub>	nitrous acid

[1 mark]

## Question 8

Use the following reactions to answer the question below:



Which of the following statements is true?

- A.  $\text{HNO}_3$  and  $\text{H}_2\text{O}$  both act as acids once
- B.  $\text{H}_2\text{O}$  is shown acting as a Bronsted-Lowry acid only
- C.  $\text{H}_2\text{O}$  reacts as an acid twice
- D.  $\text{H}_2\text{O}$  is shown as a diprotic acid

[1 mark]

### Question 9

Which species are Bronsted-Lowry acids in the reaction shown?



- A.  $\text{HCN}$  and  $\text{H}_2\text{PO}_4^-$
- B.  $\text{HCN}$  and  $\text{CN}^-$
- C.  $\text{H}_2\text{PO}_4^-$  and  $\text{HPO}_4^{2-}$
- D.  $\text{HCN}$  and  $\text{HPO}_4^{2-}$

[1 mark]

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### Question 10

Which of the following solutions will react with a strip magnesium ribbon?

- A. Sodium hydrogencarbonate
- B. Sodium hydrogensulfate
- C. Ammonia
- D. Limewater

[1 mark]