

# 8.1 Theories & Reactions of Acids & Bases

## Question Paper

Course	DPIB Chemistry
Section	8. Acids & Bases
Topic	8.1 Theories & Reactions of Acids & Bases
Difficulty	Easy

**Time allowed:** 20  
**Score:** /10  
**Percentage:** /100

### Question 1

Using your knowledge of the Brønsted-Lowry theory, which of the following correctly describes ammonia?

- A. neutral
- B. acid
- C. base
- D. amphoteric

[1 mark]

### Question 2

In the Brønsted-Lowry theory of acids and bases, the difference between a conjugate acid and its conjugate base is the presence of which of the following?

- A. a positive charge
- B. a pair of electrons
- C. a proton
- D. a hydrogen atom

[1 mark]

### Question 3

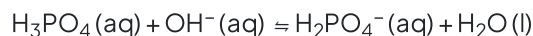
Which of the following ions or compounds is amphiprotic?

- A.  $\text{P}_4\text{O}_{10}$
- B.  $\text{PO}_4^{3-}$
- C.  $\text{HCO}_3^-$
- D.  $\text{Al}_2\text{O}_3$

[1 mark]

### Question 4

In the following reaction, identify which two species are acting as Brønsted–Lowry acids



- A.  $\text{H}_2\text{PO}_4^-(\text{aq})$  and  $\text{OH}^-(\text{aq})$
- B.  $\text{H}_3\text{PO}_4(\text{aq})$  and  $\text{H}_2\text{PO}_4^-(\text{aq})$
- C.  $\text{H}_2\text{PO}_4^-(\text{aq})$  and  $\text{H}_2\text{O}(\text{l})$
- D.  $\text{H}_3\text{PO}_4(\text{aq})$  and  $\text{H}_2\text{O}(\text{l})$

[1 mark]

### Question 5

Potassium hydrogen carbonate reacts vigorously with dilute sulfuric acid. Identify the correct formulas of the substances produced in the reaction

- A.  $\text{K}_2\text{SO}_4 + \text{H}_2\text{O} + \text{CO}_2$
- B.  $\text{K}_2\text{SO}_4 + \text{CO}_2$
- C.  $\text{KSO}_4 + \text{H}_2\text{O} + \text{CO}_2$
- D.  $\text{KSO}_4 + \text{H}_2\text{CO}_3$

[1 mark]

### Question 6

Copper(II) sulfate can be made by the reaction between dilute sulfuric acid and which of the following?

- I. Cu
  - II. CuO
  - III.  $\text{CuCO}_3$
- A. I and II only
  - B. I and III only
  - C. II and III only
  - D. I, II and III

[1 mark]

### Question 7

Which statement is correct for the following equation?



- A.  $\text{OH}^-$  and  $\text{H}_2\text{O}$  are an acid and conjugate base pair
- B.  $\text{SO}_4^{2-}$  is acting as Brønsted–Lowry acid
- C.  $\text{HSO}_4^-$  and  $\text{SO}_4^{2-}$  are a base and conjugate acid pair
- D.  $\text{OH}^-$  and  $\text{H}_2\text{O}$  are a base and conjugate acid pair

[1 mark]

### Question 8

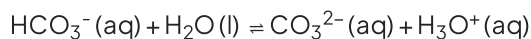
Which row shows the correct acid and base needed to make the salt specified?

	Acid	Base	Salt
<b>A</b>	$\text{NaHCO}_3$	$\text{SO}_2$	$\text{Na}_2\text{SO}_4$
<b>B</b>	$\text{HNO}_3$	$\text{SO}_3$	$(\text{NH}_4)_2\text{SO}_4$
<b>C</b>	$\text{H}_2\text{SO}_4$	$\text{ZnO}$	$\text{ZnSO}_3$
<b>D</b>	$\text{H}_2\text{SO}_4$	$\text{NH}_4\text{OH}$	$(\text{NH}_4)_2\text{SO}_4$

[1 mark]

### Question 9

Which is a conjugate acid–base pair?

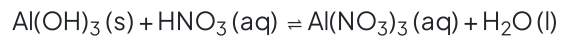


- A.  $\text{HCO}_3^- / \text{H}_3\text{O}^+$
- B.  $\text{HCO}_3^- / \text{CO}_3^{2-}$
- C.  $\text{H}_2\text{O} / \text{CO}_3^{2-}$
- D.  $\text{HCO}_3^- / \text{H}_2\text{O}$

[1 mark]

**Question 10**

Which coefficients balance the following acid-base equation?



A	3	1	3	1
B	2	2	1	3
C	1	3	1	3
D	1	2	1	2

[1 mark]