

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	Hard

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

Question 1

Some species may be classified as amphiprotic, some as amphoteric and some as both. Which of the following applies to 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 2

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 3

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 4

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. MgCO₃
- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

[1 mark]

Question 5

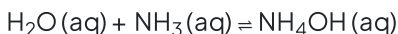
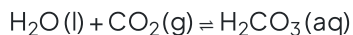
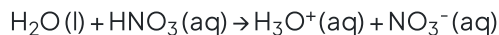
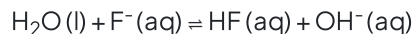
Phosphoric acid is a **polyprotic** acid and can produce amphiprotic species when it dissociates. Which of the following species is amphiprotic?

- I. HPO₄²⁻
 - II. H₂PO₄⁻
 - III. PO₄³⁻
- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

[1 mark]

Question 6

Use the following reactions to answer the question below:



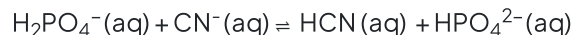
Which of the following statements is true?

- A. HNO_3 and H_2O both act as acids once
- B. H_2O is shown acting as a Bronsted-Lowry acid only
- C. H_2O reacts as an acid twice
- D. H_2O is shown as a diprotic acid

[1 mark]

Question 7

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



- A. HCN and H_2PO_4^-
- B. HCN and CN^-
- C. H_2PO_4^- and HPO_4^{2-}
- D. HCN and HPO_4^{2-}

[1 mark]

Question 8

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

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

[1 mark]

Question 9

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

- A. HCl
- B. CH₃COOH
- C. BF₃
- D. CF₃COOH

[1 mark]

Question 10

Which row shows the correct systematic name of the acid?

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

[1 mark]