

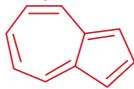
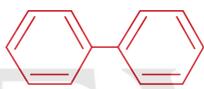
# Mock Test – 2

Time: 3 Hrs

Max. Marks: 70

## General Instructions

1. All questions are compulsory.
2. Question numbers 1 to 8 are very short answer questions and carry 1 mark each.
3. Question numbers 9 to 18 are short answer questions and carry 2 marks each.
4. Question numbers 19 to 27 are also short answer questions and carry 3 marks each.
5. Question numbers 28 to 30 are long answer questions and carry 5 marks each.
6. Use log tables if necessary, use of calculators is not allowed.

1. Calculate the number of oxalic acid molecules in 100 ml of 0.01 M oxalic acid solution. (1)
  2. Define molarity. What does 1 M solution of sodium carbonate mean? (1)
  3. State Charles' law. (1)
  4. Define (a) radiation and (b) visible light. (1)
  5. What is meant by spontaneous processes? (1)
  6. State Henry's law. (1)
  7. What are the harmful effects of  $\text{SO}_2$ ? (1)
  8. What volume will 3.00 g of mercury occupy? (Density of mercury is  $13.6 \text{ g cm}^{-3}$ ) (1)
  9. The molar heat of formation of  $\text{NH}_4\text{NO}_3(\text{s})$  is  $-367.54 \text{ kJ}$  and those of  $\text{N}_2\text{O}(\text{g})$  and  $\text{H}_2\text{O}(\text{l})$  are  $+81.46 \text{ kJ}$  and  $-285.78 \text{ kJ}$ , respectively, at  $25^\circ\text{C}$  and 1.0 atm pressure. Calculate  $\Delta H$  and  $\Delta U$  for the reaction. (2)
  10. State the important postulates of Bohr's model of atom. (2)
  11. Describe a coordinate bond with one example. Explain how does it differ from a covalent bond? (2)
  12. Lithium is the only alkali metal to form nitride directly. Explain. (2)
  13. What are the causes of deviation from ideal behavior? (2)
  14. Calculate the pH of (a) 0.001 M HCl and (b) 0.01 M NaOH. (2)
  15. What are the possible structures of the carboxylic acids with a molecular formula  $\text{C}_4\text{H}_8\text{O}_2$  and label each C atom as  $sp$ ,  $sp^2$  and  $sp^3$ ? (2)
  16. Give the basic difference between Kjeldahl process and Dumas process for the estimation of nitrogen. (2)
  17. Distinguish between classical smog and photochemical smog. (2)
  18. Explain Kolbe's electrolytic process for preparation of alkanes. (2)
  19. Give the main postulates of Dalton's atomic theory. (3)
  20. What is cement? Give its composition and how is it manufactured? (3)
  21. Account for the linear shape of  $\text{I}^{3-}$  ion. (3)
  22. Predict which of the following systems would be aromatic and why?  
(a)  (1)  
(b)  (1)  
(c)  (1)  
(d)  (1) (3)
  23. If 15 ml of 0.05 M  $\text{SeO}_2$  reacts with 30.6 ml of 0.1 M  $\text{Cr}(\text{SO}_4)_3$ , to what oxidation state does selenium gets converted? (3)
  24. What is meant by autoprotolysis of water and how can it be achieved? (3)
  25. Explain the structures of diborane and boric acid. (3)
  26. Describe a method that can be used to separate two compounds with different solubilities in a solvent S. (3)
  27. How many grams of chlorine are required to completely react with 0.40 g of hydrogen ( $\text{H}_2$ ) to yield hydrochloric acid (HCl)? Also calculate the amount of HCl formed. (3)
  28. How will you convert benzene into the following?  
(a) *p*-Nitrobromo benzene  
(b) *m*-Nitrochloro benzene  
(c) *p*-Nitro toluene  
(d) Acetophenone
- OR**
- How will you convert the following compounds to benzene?
- (a) Acetylene
  - (b) Benzoic acid
  - (c) Cyclohexane
  - (d) Benzenediazoniumchloride (5)

29. What is catenation? Explain as to why carbon has maximum tendency for catenation?

**OR**

What is tautomerism? How does it differ from resonance?

(5)

30. Write short notes on:

- (a) Fullerenes
- (b) Structure of graphite
- (c) Structure of diborane

**OR**

Give a brief account of:

- (a) Structure of diborane
- (b) Silicones and their uses
- (c) Uses of aluminium

(5)

WILEY