

# AMRITA VIDYALAYAM

## SECOND TERMINAL EXAMINATION 2018 -'19

Class : XI

Marks : 70

Time : 3 hrs

### CHEMISTRY (043)

#### General Instructions:

1. All questions are compulsory.
2. Question No. 1 to 5 are very short answer questions of 1 mark each.
3. Question No. 6 to 10 are short answer questions of 2 marks each.
4. Question No. 11 to 22 are also short answer questions of 3 marks each.
5. Question No. 23 is a value based question of 4 marks.
6. Question No. 24 to 26 are long answer questions of 5 marks each.
7. Use log tables if necessary. Use of calculator is not allowed.

1. Write the relationship between Gibb's free energy and equilibrium constant.
2. Calculate the oxidation number of Mn in  $\text{KMnO}_4$ .
3. What is the chemical formula of permutit?
4. Why are group 1 elements called alkali metals?
5. Classify the following species into electrophiles and nucleophiles.  
 $\text{SO}_3$ ,  $\text{BF}_3$ ,  $\text{H}_2\text{O}$ ,  $\text{OH}^-$
6. What are buffer solutions? Give examples.
7. Suggest two reasons as to why CO is poisonous.
8. Derive the structure of
  - a) 2-Chlorohexane.
  - b) Pent-4-en-2-ol.
9. What are the functions of salt bridge?
10. What do you understand by
  - a) syn gas?
  - b) water gas shift reaction?
11.
  - a) What is bond order?
  - b) Calculate the number of sigma and pi bonds present in
    - (i)  $\text{CH}_4 - \text{CH} = \text{CH}_2$
    - (ii)  $\text{C}_2\text{H}_4$
12. The following concentrations were obtained for the formation of  $\text{NH}_3$  from  $\text{N}_2$  and  $\text{H}_2$  at equilibrium at 500K.  $[\text{N}_2] = 1.5 \times 10^{-2}\text{M}$   $[\text{H}_2] = 3.0 \times 10^{-2}\text{M}$  and  $[\text{NH}_3] = 1.2 \times 10^{-2}\text{M}$ . Calculate equilibrium constant.
13. Explain the difference in properties of diamond and graphite on the basis of their structures.
14. Define.
  - a) Law of chemical equilibrium
  - b) Homogeneous and heterogeneous equilibria.
15. Classify following oxides as neutral, acidic, basic or amphoteric.  
 $\text{CO}$ ,  $\text{B}_2\text{O}_3$ ,  $\text{SiO}_2$ ,  $\text{CO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{Ti}_2\text{O}_3$
16. Balance the following redox reaction by ion- electron method.  
 $\text{MnO}_4^- (\text{aq}) + \text{I}^- (\text{aq}) \rightarrow \text{MnO}_2 (\text{s}) + \text{I}_2 (\text{s})$  (in basic medium)
17. Carry out the following conversions.
  - a) Ethyl alcohol to ethene
  - b) Sodium acetate to methane
  - c) Benzene to nitrobenzene
18. Discuss the principle and method of softening of hard water by synthetic ion-exchange method.
19. Explain.
  - a) Solution of alkali metal in liquid  $\text{NH}_3$  acquire different colours.
  - b) Be and Mg do not give colour to the flame whereas other alkaline earth metals do so. Why?

