

# RAMAKRISHNA MISSION VIDYAMANDIRA

Belur Math, Howrah – 711 202

ADMISSION TEST – 2017

INDUSTRIAL CHEMISTRY (Honours)

Date : 12-06-2017

Full Marks : 50

Time: 3:00 p.m. – 4:00 p.m

## Instructions for the candidate

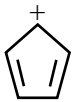

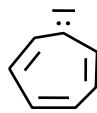

Answer all the questions given below. Each question carries **2 marks** for correct answer and **-1 mark** for wrong answer. Tick (✓) the correct option. The tick must be very clear — if it is smudgy or not clear, no marks will be awarded. **Calculator is not allowed.**

Name of the student : \_\_\_\_\_

Application No. : \_\_\_\_\_

Signature of the invigilator : \_\_\_\_\_

- How many oxygen atoms will be present in 88g of  $\text{CO}_2$ ?  
a)  $24.08 \times 10^{23}$                       b)  $6.023 \times 10^{23}$                       c)  $44 \times 10^{23}$                       d)  $22 \times 10^{24}$
- What will be the molarity of a solution, which contains 5.85g of NaCl (s) per 500 mL?  
a)  $4 \text{ mol L}^{-1}$                       b)  $20 \text{ mol L}^{-1}$                       c)  $0.2 \text{ mol L}^{-1}$                       d)  $2 \text{ mol L}^{-1}$
- If the ionisation energy of hydrogen atom is 13.6 eV, the energy required to excite it from ground state to the next higher state is approximately  
a) 3.4 eV                      b) 10.2 eV                      c) 17.2 eV                      d) 13.6 eV
- Which of the following is arranged in order of increasing metallic character?  
a)  $\text{P} < \text{Si} < \text{Na} < \text{Be} < \text{Mg}$                       b)  $\text{Be} < \text{Mg} < \text{P} < \text{Na} < \text{Si}$   
c)  $\text{Si} < \text{Be} < \text{Mg} < \text{Na} < \text{P}$                       d)  $\text{P} < \text{Si} < \text{Be} < \text{Mg} < \text{Na}$
- Though covalent in nature, methanol is soluble in water, why?  
a) Methanol is transparent like water  
b) Due to hydrogen bonding between methanol and water molecules  
c) Due to van der Waal's forces between methanol and water  
d) Due to covalent attraction forces
- If 4 moles of an ideal gas at 300K occupy volume of 89.6 L, then pressure of the gas will be  
a) 2 atm                      b) 1 atm                      c) 1.099 atm                      d) 2.9110 atm
- A process is called reversible when  
a) surrounding and system change are same  
b) there is no boundary between system and surrounding  
c) surrounding is always in equilibrium with system  
d) system changes into surrounding spontaneously

8. Which of the following is not Lewis acid?  
 a)  $\text{BF}_3$                                       b)  $\text{AlCl}_3$                                       c)  $\text{FeCl}_3$                                       d)  $\text{PH}_3$
9. How many hydrogen bonded water molecules are associated with  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ?  
 a) Five    b) One    c) Four    d) Three
10. Which of the following is not present in portland cement?  
 a)  $\text{Ca}_3\text{Al}_2\text{O}_6$                                       b)  $\text{Ca}_3\text{SiO}_5$                                       c)  $\text{Ca}_2\text{SiO}_4$                                       d)  $\text{Ca}_3(\text{PO}_4)_2$
11. Gypsum is added to portland cement to  
 a) fasten the process of setting    b) slow down the process of setting  
 c) improve the colour of the cement    d) increase the melting point of cement
12. In  $\text{SiO}_4^{4-}$ , the tetrahedral molecule, two oxygen atoms are shared in  
 a) sheet silicates    b) double-chain silicates  
 c) chain silicates    d) three-dimensional silicates
13. Which type of intermediate (A) is formed during the reaction?  
 $\text{CH}_3\text{CH}_2 - \text{N} = \text{N} - \text{CH}_2\text{CH}_3 \xrightarrow{\text{Heat}} (\text{A}) + \text{N}_2$   
 a) Carbocation                                      b) Carbanion                                      c) Free radical                                      d) Carbene
14. Which of the following species is aromatic?  
 a)                                       b)                                       c)                                       d) 
15. Incomplete combustion of petrol or diesel in automobile engine produces  
 a)  $\text{CO}$  and  $\text{H}_2\text{O}$  vapours    b)  $\text{CO}$  and  $\text{NO}_2$                                       c)  $\text{CO}$     d)  $\text{SO}_2$
16. How many chloride ions are surrounding sodium ion in sodium chloride crystal?  
 a) 4    b) 8    c) 6    d) 12
17. Which of the following does not represent a type of crystal system?  
 a) Triclinic    b) Monoclinic    c) Rhombohedral    d) Isotropical
18. Specific conductance of 0.1 M  $\text{NaCl}$  solution is  $1.01 \times 10^{-2} \text{ ohm}^{-1} \text{ cm}^{-1}$ . Its molar conductance in  $\text{ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$  is  
 a)  $1.01 \times 10^2$                                       b)  $1.01 \times 10^3$                                       c)  $1.01 \times 10^4$                                       d) 1.01
19. Half-life period of a first order reaction is 10 min. What percentage of the reaction will be completed in 100 min?  
 a) 25%    b) 50%    c) 99.9%    d) 75%
20. The activity of an enzyme become ineffective  
 a) at low temperature    b) at atmospheric pressure    c) at high temperature    d) in aqueous medium

21. What would happen when a solution of potassium chromate is treated with an excess of dilute nitric acid?

- a)  $\text{Cu}^{3+}$  and  $\text{Cr}_2\text{O}_7^{2-}$  are formed  
b)  $\text{Cr}_2\text{O}_7^{2-}$  and  $\text{H}_2\text{O}$  are formed  
c)  $\text{CrO}_4^{2-}$  is reduced to +3 state of Cr  
d)  $\text{CrO}_4^{2-}$  is oxidised to +7 state of Cr

22. The number of unpaired electrons in  $[\text{Ni}(\text{CO})_4]$  is

- a) one  
b) two  
c) three  
d) zero

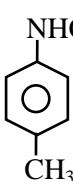
23. Synthetic polymer prepared by using caprolactam is known as

- a) terylene  
b) teflon  
c) nylon 6  
d) neoprene

24. Which of the following is not an example of addition polymer?

- a) polythene  
b) polystyrene  
c) neoprene  
d) nylon 6, 6

25. When p-toluidine reacts with chloroform and alcoholic KOH, then the product is

- a) 
- b) 
- c) 
- d) 

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