

# RAMAKRISHNA MISSION VIDYAMANDIRA

Belur Math, Howrah – 711 202

ADMISSION TEST – 2018

INDUSTRIAL CHEMISTRY (Honours)

Date : 18-06-2018

Full Marks : 50

Time: 03:00 p.m – 4:00 p.m.

## Instructions for the candidate

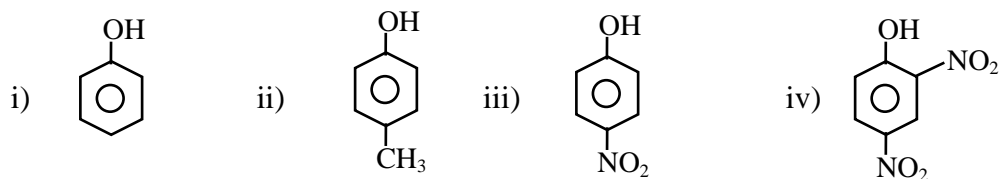
Answer all the questions given below. Each question carries 2 marks for correct answer and –1 mark for wrong answer. Tick (✓) the correct option in the **OMR SHEET**. The tick must be very clear — if it is smudgy or not clear, no marks will be awarded. **Calculator is not allowed.**

- How much mass of Sodium acetate is required to make 250 ml of 0.575 molar aqueous solution—  
a) 11.79 gm                      b) 15.38 gm                      c) 10.81 gm                      d) 23.35 gm
- Two electrons present in M shell will differ in  
a) principal quantum number                      b) azimuthal quantum number  
c) Magnetic quantum number                      d) Spin quantum number
- Arrange the following in order of increasing dipole moment :  $\text{H}_2\text{O}$ ,  $\text{H}_2\text{S}$ ,  $\text{BF}_3$ .  
a)  $\text{BF}_3 < \text{H}_2\text{S} < \text{H}_2\text{O}$                       b)  $\text{H}_2\text{S} < \text{BF}_3 < \text{H}_2\text{O}$                       c)  $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{BF}_3$                       d)  $\text{BF}_3 < \text{H}_2\text{O} < \text{H}_2\text{S}$
- How many number of moles of nitrogen will be present in 2.24 L of nitrogen gas at STP?  
a) 9.9                      b) 0.099                      c) 0.001                      d) 1.00
- For the reaction :  $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl}$ ;  $\Delta H = -44\text{Kcal}$ . What is the enthalpy of decomposition of HCl?  
a) +44 Kcal/mol                      b) –44 Kcal/mol                      c) –22 Kcal/mol                      d) +22 Kcal/mol
- The complex ion which has no d-electrons in the central metal atom is  
a)  $[\text{MnO}_4]^-$                       b)  $[\text{Co}(\text{NH}_3)_6]^{3+}$                       c)  $[\text{Fe}(\text{CN})_6]^{3-}$                       d)  $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$
- What will be the order of decreasing reducing nature for the given metals?  
a)  $\text{Zn} > \text{Na} > \text{Fe} > \text{Mg} > \text{Cu} > \text{Ag}$                       b)  $\text{Cu} > \text{Fe} > \text{Mg} > \text{Zn} > \text{Na} > \text{Ag}$   
c)  $\text{Ag} > \text{Cu} > \text{Fe} > \text{Zn} > \text{Mg} > \text{Na}$                       d)  $\text{Na} > \text{Mg} > \text{Zn} > \text{Fe} > \text{Cu} > \text{Ag}$
- If the radius of an octahedral void is r and radius of atom in close packing is R, the relation between r and R is  
a)  $r = 0.414R$                       b)  $R = 0.414r$                       c)  $r = 2R$                       d)  $r = \sqrt{2}R$
- The edge length of fcc cell is 508 pm. If radius of cation is 110pm, the radius of anion is  
a) 110 pm                      b) 220 pm                      c) 285 pm                      d) 144 pm
- What amount of  $\text{CaCl}_2$  ( $i = 2.47$ ) is dissolved in 2 litres of water so that its osmotic pressure is 0.5 atm at  $27^\circ\text{C}$ ?  
a) 3.42 g                      b) 9.24 g                      c) 2.834 g                      d) 1.820 g

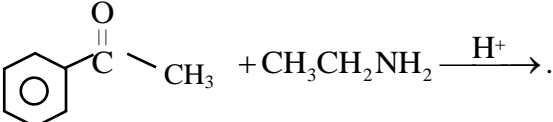
11. For the cell reaction :  $2\text{Cu}^+(\text{aq}) \rightarrow \text{Cu}(\text{s}) + \text{Cu}^{2+}(\text{aq})$ , the standard cell potential is 0.36 V. The equilibrium constant for the reaction is
- a)  $1.2 \times 10^6$                       b)  $7.4 \times 10^{12}$                       c)  $2.4 \times 10^6$                       d)  $5.5 \times 10^8$
12. The overall rate of reaction is governed by
- a) the rate of fastest intermediate step                      b) the sum total of the rates of all intermediate steps
- c) the average of the rates of all intermediate steps                      d) the rate of slowest intermediate step
13. The activity of an enzyme becomes ineffective
- a) at low temperature                      b) at atmospheric pressure
- c) at high temperature                      d) in aqueous medium
14. Which of the following metals cannot be obtained by reduction of its metal oxide by aluminium?
- a) Cr                      b) Mn                      c) Fe                      d) Mg
15. Arrange the following in decreasing Lewis acid strength :  $\text{PF}_3, \text{PCl}_3, \text{PBr}_3, \text{PI}_3$
- a)  $\text{PI}_3 > \text{PBr}_3 > \text{PCl}_3 > \text{PF}_3$                       b)  $\text{PF}_3 > \text{PCl}_3 > \text{PBr}_3 > \text{PI}_3$
- c)  $\text{PCl}_3 > \text{PBr}_3 > \text{PI}_3 > \text{PF}_3$                       d)  $\text{PBr}_3 > \text{PI}_3 > \text{PF}_3 > \text{PCl}_3$

16.  $(\text{CH}_3)_3\text{C}-\text{CH}_2\text{OH} \xrightarrow[170^\circ\text{C}]{\text{Conc. H}_2\text{SO}_4} \text{X}$ ; In the reaction, X is
- a)  $(\text{CH}_3)_2\text{C}=\text{CHCH}_3$                       b)  $\text{CH}_3\text{C}\equiv\text{CH}$
- c)  $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_3$                       d)  $\text{CH}_3-\text{CH}_2-\underset{\text{CH}_3}{\text{C}}=\text{CH}_2$

17. The correct order of strength of acidity of the following compounds is

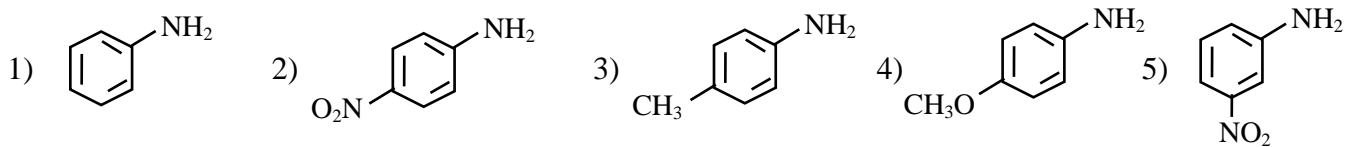


- a) (ii) > (i) > (iii) > (iv)                      b) (i) > (ii) > (iii) > (iv)
- c) (iv) > (iii) > (ii) > (i)                      d) (iv) > (iii) > (i) > (ii)

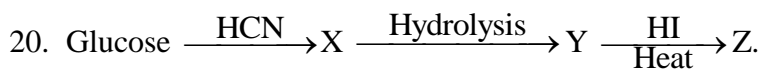
18. Find the product of the given reaction : 

- a)                       b) 
- c)                       d) 

19. The correct order of increasing basic nature of the following bases is



- a)  $2 < 5 < 1 < 3 < 4$       b)  $5 < 2 < 1 < 3 < 4$       c)  $2 < 5 < 1 < 4 < 3$       d)  $5 < 2 < 1 < 4 < 3$



Identify Z.

- a) 2 – Iodoheptane      b) Heptane – 2 – ol      c) 2 – Iodohexane      d) Heptanoic acid

21. Which of the following is not true for thermoplastic polymers?

- a) Thermoplastic are linear polymers      b) They soften and melt on heating  
c) Molten polymer can be remoulded into any shape      d) They have cross-linkages which break on heating

22. Synthetic polymer prepared by using caprolactum is known as

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

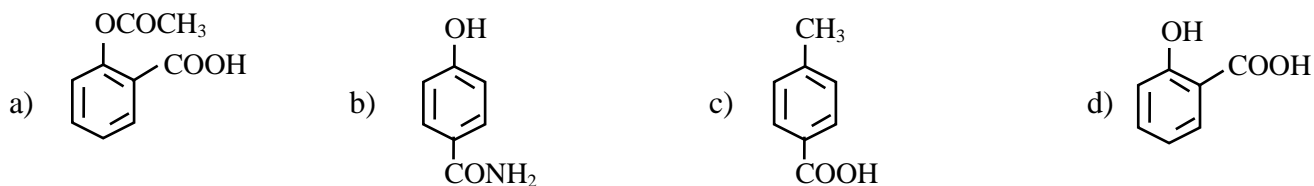
23. Most commercial glasses consist of

- a) CaO      b) Na<sub>2</sub>O      c) SiO<sub>2</sub>      d) All

24. Bakelite is an example of

- a) elastomer      b) fibre      c) thermoplastic      d) thermosetting

25. Which of the following compounds represents an analgesic?



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