Gurudas College

Internal Examination, 2020

CHEMISTRY (General)

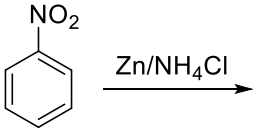
Semester-IV

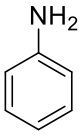
Paper-GE/CC-4

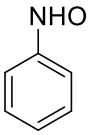
Time- 1 hr.30 mins **Full Marks-50**

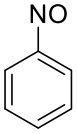
Group- A (Theoretical)
Answer **any ten** questions
(Each question carry equal marks)

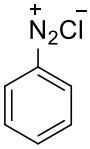
1. Identify the product of the following reaction.



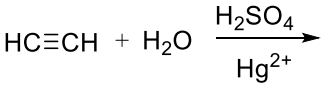
(a) 

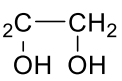
(b) 

(c) 

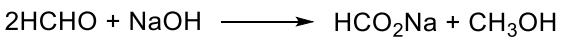
(d) 

2. Which of the following compounds is the strongest base in aqueous medium?
   (a) Me_3N (b) Me_2NH (c) $MeNH_2$ (d) NH_3
3. Identify the product of the following reaction.

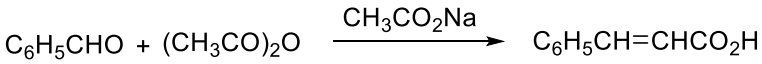


(a) $CH_2{=}CH_2$ (b)  (c) CH_3CHO (d) CH_3CH_2OH

4. The following reaction is an example of



   (a) Cannizzaro Reaction (b) Wittig Reaction
   (c) Stephen Reaction (d) Aldol Condensation
5. Which of the following compounds is the strongest acid?
   (a) $BrCH_2COOH$ (b) $ClCH_2COOH$ (c) ICH_2COOH (d) FCH_2COOH
6. The following reaction is an example of



   (a) Perkin Reaction (b) Claisen Condensation
   (c) Knovenagal Reaction (d) None of this

7. Which one of the following exhibit rotational spectroscopy

(a) CO_2 (b) H_2 (c) N_2 (d) CO

8. The selection rule for vibrational transition of simple harmonic oscillator (SHO) is

$(a)\ \Delta v = 0$ (b) $\Delta v = \pm 2$ (c) $\Delta v = \pm 1$ (d) None of these

9. The spacing between two successive lines in rotational spectra for rigid rotator is

(a) 2B (b) 4B (c) 6B (d) 8B

10. Which one of the following is known as the Schrödinger equation?

(a) $E = h\nu$ (b) $E = mc^2$ (c) $\lambda = \frac{h}{p}$ (d) $H\Psi = E\Psi$

11. The wave function of a particle in a 1-D box is given by

(a) $\sqrt{\frac{2}{L}} sin\ \frac{\pi x}{L}$ (b) $\sqrt{\frac{2}{L}} sin\ \frac{nx}{L}$ (c) $\sqrt{\frac{2}{L}} sin\ \frac{n\pi x}{L}$ (d) $\sqrt{\frac{2}{L}} sin\ \frac{x}{L}$

12. Energy of a particle of mass 'm' moving in a one-dimensional box of length 'l' has the energy expression $E = \frac{n^2h^2}{8ml^2}$ (h = Plank's constant). Here n can have a value

(a) n = 0 (b) n = 1 (c) n = 2 .5 (d) n = -3

13. In crystal field theory ions or atoms are considered as

(a) Cations (b) Anions (c) Point charges (d) Molecules

14. According to crystal field theory, metals hold ligands via

(a) Mixing of orbitals (b) Electrostatic force (c) Hydrogen bonding (d) Van der Waals force

Group- B (Practical)

Answer **any six** questions
(Each question carry equal marks)

15. If a solid organic sample is soluble in water then during solubility test, its solubility in acid or alkaline medium is need not be tested because

(a) pH of water is 7.0 (b) Water is polar solvent (c) Both acidic or alkaline solution contain water (d) It's the protocol

16. For fusion in Lassaigne's test, metallic Na is used instead of metallic Al because

(a) Metallic Na catches fire in contact with water (b) Metallic Na is soft (c) Low cost of metallic Na (d) All fused Na –salts are water soluble

17. Which functional group is detected by DNP test?

(a) Carbonyl group (b) Phenolic –OH group (c) Acid group (d) None of these

18. An alcoholic solution of organic compound when treated with neutral $FeCl_3$ solution, a violet colour appeared – which indicated that the compound contained-

(a) Carbonyl group (b) Nitro group (c) Phenolic –OH group (d) Amino group

19. The reagent used in Mulliken- Barker's test is-

(a) $NaNO_2$/dil. HCl (b) Sn/conc. HCl (c) H_2/Ni (d) Zn dust/NH_4Cl/EtOH

20. Brady's reagent is

(a) 2, 4 Dinitrophenylhydrazine (b) 2, 4 Dinitrophenol (c) 2, 4 Diaminobenzaldehyde (d) 2, 4 Dihydroxybenzoic acid

21. Which functional group is detected by Red-Dye Test?

(a) Aliphatic amino group (b) Aromatic amino group (c) Aromatic nitro group (d) None of these

22. Sodium bicarbonate test is used for the detection of

(a) Nitro group (b) Aromatic amino group (c) Acid group (d) None of these

Group- C (Internal Assessment)

Answer **any four** questions

(Each question carry equal marks)

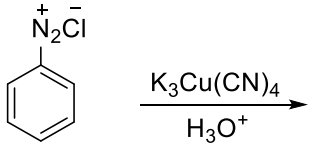
23. In quantum mechanics, the observable corresponds to some

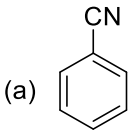
(a) Wave function (b) Operator (c) Normalization (d) None of these

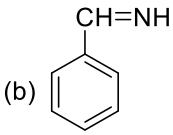
24. Normalization of a wave function is based on the fact that total probability is constant. Its value is

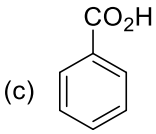
(a) 0 (b) 1 (c) Plank's constant (d) infinity

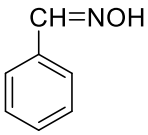
25. Identify the product of the following reaction.



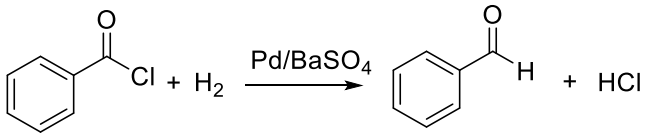
(a) 

(b) 

(c) 

(d) 

26. The following reaction is an example of



(a) Wolff-Kishner Reduction (b) Clemmensen Reduction

(c) Stephen Reaction (d) Rosenmund's Reduction

27. According to spectrochemical series the proper increasing order of halide ligand strength is

(a) $F^- < Cl^- < Br^- < I^-$ (b) $I^- < Br^- < Cl^- < F^-$ (c) $F^- < I^- < Br^- < Cl^-$ (d) $Cl^- < F^- < Br^- < I^-$

28. Jahn-Teller distortion in octahedral complexes is the consequence of unequal distribution of electrons in

(a) t_{2g} level (b) e_g level (c) t_2 level (d) e level