

PRE-MEDICAL : ENTHUSIAST COURSE
ALL PHASE



ALLENTM
CAREER INSTITUTE
KOTA (RAJASTHAN)

TEST PATTERN : BOARD PATTERN (GSEB)

HAVE CONTROL → HAVE PATIENCE → HAVE CONFIDENCE ⇒ 100% SUCCESS

CHEMISTRY

PART-A

Time Allowed : 1 Hour

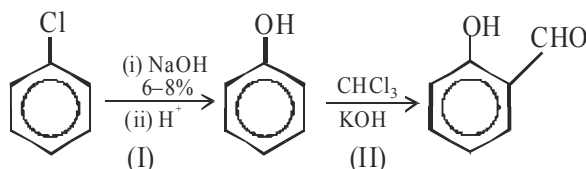
Maximum Marks : 50

Instructions :

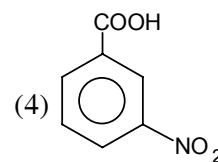
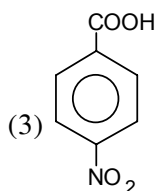
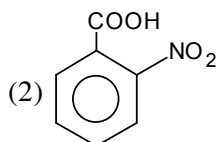
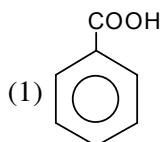
- There are 50 objective type (M.C.Q.) questions in Part-A and all questions are compulsory.
- The questions are serially numbered from 1 to 50 and each carries 1 mark.
- Read each question carefully, select proper alternative and answer in the O.M.R. sheet.
- The O.M.R. sheet is given for answering the questions. The answer of each question is represented by (1) O, (2) O, (3) O, (4) O. Darken the circle ● of the correct answer with ball-pen.
- Rough work is to be done in the space provided for this purpose in the Test Booklet only.
- Set No. of question paper printed on the upper-most right side of the question paper is to be written in the column provided in the O.M.R. sheet.

1. Which solution has the highest vapour pressure? [1]
(1) 0.02 M NaCl at 50°C (2) 0.03 M sucrose at 15°C
(3) 0.05 M CaCl₂ at 50°C (4) 0.05 M CaCl₂ at 25°C
2. The limiting equivalent conductivity of NaCl, KCl and KBr are 126.5, 150.0 and 151.5 s cm² eq⁻¹ respectively. The limiting equivalent ionic conductance for Br⁻ is 78 s cm² eq⁻¹. The limiting equivalent ionic conductance for Na⁺ ions could be: [1]
(1) 128 (2) 125 (3) 49 (4) 50
3. Which one of the following metals cannot be obtained on electrolysis of aqueous solution of its salts. [1]
(1) Mg (2) Ag (3) Cu (4) Cr
4. $\Lambda_m^0(\text{NH}_4\text{OH})$ is equal to [1]
(1) $\Lambda_m^0(\text{NH}_4\text{OH}) + \Lambda_m^0(\text{NaOH}) - \Lambda_m^0(\text{HCl})$ (2) $\Lambda_m^0(\text{NH}_4\text{Cl}) + \Lambda_m^0(\text{NaOH}) - \Lambda_m^0(\text{NaCl})$
(3) $\Lambda_m^0(\text{NH}_4\text{Cl}) + \Lambda_m^0(\text{NaCl}) - \Lambda_m^0(\text{NaOH})$ (4) $\Lambda_m^0(\text{NaOH}) + \Lambda_m^0(\text{NaCl}) - \Lambda_m^0(\text{NH}_4\text{Cl})$
5. The gold numbers of protective colloids A, B, C and D are 0.04, 0.004, 10 and 40 respectively. The protective powers of A, B, C and D are in the order [1]
(1) A > B > C > D (2) B > A > C > D (3) D > C > A > B (4) D > C > B > A

6. Which of the following polymers can be used for lubrication and as an insulator? [1]
 (1) SBR (2) PVC (3) PTFE (4) PAN
7. Which of the following antibiotic is bactericide? [1]
 (1) Erythromycin (2) Tetracyclin (3) Penicillin (4) Chloramphenicol
8. The crystal system of a compound with unit cell dimensions $a = 0.387$, $b = 0.387$, $c = 0.504$ and $\alpha = \beta = 90^\circ$ and $\gamma = 120^\circ$ is [1]
 (1) cubic (2) hexagonal (3) orthorhombic (4) rhombohedral
9. I & II reaction respectively - [1]



- (1) Friedel-Craft reaction, Dow's reaction (2) Fittig reaction ; Riemmer -Tieman reaction
 (3) Dow's reaction ; Reimmer -Tieman reaction (4) Wurtz reaction ; Riemmer -Tieman reaction
10. Which of the following is colourless and diamagnetic? [1]
 (1) NO_2 (2) N_2O_3 (3) NO (4) N_2O_4
11. How is β -black phosphorus made ? [1]
 (1) By heating red phosphorus in a closed tube at 903 K temp.
 (2) By heating red phosphorus in a closed tube at 803 K temp.
 (3) By heating white phosphorus at 473 K temperature under high pressure.
 (4) By heating white phosphorus at 573 K temperature under low pressure.
12. Geometry and physical state of ClF_5 is [1]
 (1) Square pyramidal, liquid (2) Pentagonal bipyramidal, gas
 (3) Tetrahedral, solid (4) Trigonal bipyramidal, solid
13. Which of the following is paramagnetic? [1]
 (1) $[\text{Ni}(\text{NH}_3)_4]^{2+}$ (2) $[\text{Fe}(\text{CN})_6]^{4-}$ (3) $[\text{Co}(\text{NH}_3)_6]^{3+}$ (4) $[\text{Fe}(\text{CN})_6]^{3-}$
14. $\text{CH}_3 - \text{CH}_3 + \text{Cl}_2 \xrightarrow{h\nu} \text{X} + \text{Mg} \xrightarrow{\text{Dry Ether}} \text{Y} \xrightarrow{\text{H}_2\text{O}} \text{Z}$ Identify X, Y and Z. [1]
 (1) $\text{C}_2\text{H}_5\text{Cl}$; $\text{C}_2\text{H}_5\text{MgCl}$; C_2H_6 (2) 2-Chloropropane ; $\text{C}_3\text{H}_7\text{MgCl}$; ethyne
 (3) $\text{C}_2\text{H}_5\text{Cl}$; $\text{C}_2\text{H}_5\text{MgCl}$; ethene (4) $\text{C}_2\text{H}_5\text{Cl}$; C_2H_6 ; Ethyne
15. The compound $[\text{Co}(\text{NH}_3)_2(\text{en})\text{Cl}_2]$ can form [1]
 (1) linkage isomers only (2) coordination isomers only
 (3) optical isomers & geometrical isomers (4) geometrical isomers only
16. Consider acidity of the carboxylic acid, which one of the following is the strongest acid ? [1]



17. Which will not show optical isomerism? [1]
 (1) $[\text{Co}(\text{en})_3]\text{Cl}_3$ (2) $[\text{Co}(\text{en})_2(\text{H}_2\text{O})_2]^{2+}$ (3) $[\text{Co}(\text{en})(\text{H}_2\text{O})_2]^{3+}$ (4) $[\text{Cr}(\text{NH}_3)(\text{H}_2\text{O})\text{ClBrIF}]$
18. For coagulation of As_2S_3 , the correct order of coagulation power of ions are [1]
 (1) $\text{Na}^+ > \text{Ba}^{+2} > \text{Fe}^{+3}$ (2) $\text{PO}_4^{-3} > \text{SO}_4^{-2} > \text{Cl}^-$ (3) $\text{Na}^+ < \text{Ba}^{+2} < \text{Fe}^{+3}$ (4) $\text{Cl}^- < \text{SO}_4^{-2} < \text{PO}_4^{-3}$
19. Which is the equation for Freundlich adsorption isotherm? [1]
 (1) $\frac{m}{x} \propto p^{1/n}$ (2) $\frac{m}{x} \propto p^{1/a}$ (3) $\frac{x}{m} \propto p^{1/n}$ (4) $\frac{x}{m} \propto p^{1-n}$
20. Which of the following compound does not react with concentrated alkali to give corresponding alcohol and salt of carboxylic acid? [1]
 (1) Benzaldehyde (2) Trimethyl acetaldehyde
 (3) Dimethyl acetaldehyde (4) Formaldehyde
21. What is the temperature called when micelle is formed at the temperature higher than this? [1]
 (1) Kelvin temperature (2) Kraft temperature
 (3) Absolute temperature (4) Zero temperature
22. An organic compound A on reacting with NH_3 gives B. On heating B, it gives C. C in presence of KOH reacts with Br_2 to give $\text{CH}_3\text{-CH}_2\text{-NH}_2$, A is? [1]
 (1) CH_3COOH (2) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-COOH}$
 (3) $\text{CH}_3\text{-CH}(\text{CH}_3)\text{-COOH}$ (4) $\text{CH}_3\text{-CH}_2\text{-COOH}$
23. What is the general electronic configuration of elements of lanthanide series? [1]
 (1) $[\text{Xe}] 4f^{0-14}5d^15s^2$ (2) $[\text{Xe}] 4f^{0-14}5d^{0-14}5s^2$
 (3) $[\text{Xe}] 4f^{1-14}5d^{0-1}6s^2$ (4) $[\text{Xe}] 5f^{0-14}5d^{0-1}5s^2$
24. Chlorobenzene + methyl chloride $\xrightarrow[\text{Dry ether}]{\text{Na metal}}$? [1]
 (1) Biphenyl (2) O-chlorotoluene
 (3) P-chlorotoluene (4) Toluene
25. Which of the following compound is not chiral? [1]
 (1) 1-chloro-2-methyl pentane (2) 2-chloropentane
 (3) 1-chloropentane (4) 3-chloro-1-pentane
26. The rate of the reaction, $2\text{NO} + \text{O}_2 \longrightarrow 2\text{NO}_2$ at 25°C , is $0.028 \text{ mol lit}^{-1}\text{sec}^{-1}$. The experimental rate is given by $r = k [\text{NO}]^2[\text{O}_2]$. If the initial concentrations of the reactants are $\text{O}_2 = 0.040 \text{ molL}^{-1}$ and $\text{NO} = 0.01 \text{ molL}^{-1}$, the rate constant of the reaction is : [1]
 (1) $7.0 \times 10^{-2} \text{ L mol}^{-1} \text{ s}^{-1}$ (2) $7.0 \times 10^{-4} \text{ L}^2 \text{ mol}^{-2} \text{ s}^{-1}$
 (3) $7.0 \times 10^2 \text{ L}^2 \text{ mol}^{-2} \text{ s}^{-1}$ (4) $7.0 \times 10^3 \text{ L}^2 \text{ mol}^{-2} \text{ s}^{-1}$
27. Aspirin is known as [1]
 (1) Acetyl salicylic acid (2) Phenyl salicylate
 (3) Acetyl salicylate (4) Methyl salicylic acid
28. Given below, catalyst and corresponding process/reaction are matched. The mismatch is [1]
 (1) $[\text{RhCl}(\text{PPh}_3)_2]$: Dehydrogenation (2) $\text{TiCl}_4 + \text{Al}(\text{C}_2\text{H}_5)_3$: Polymerization
 (3) V_2O_5 : Haber's process (4) Nickel : Hydrogenation.



The reactant A is

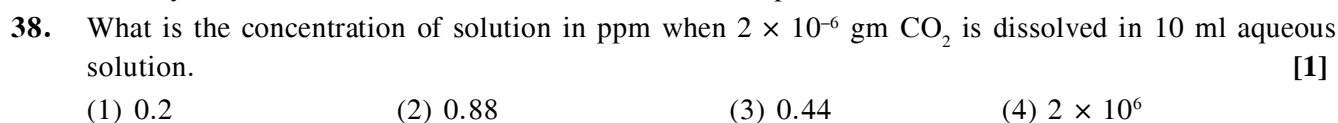
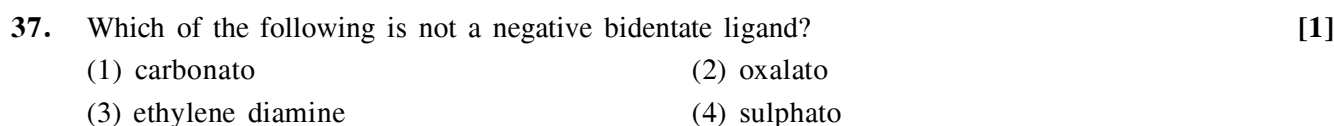
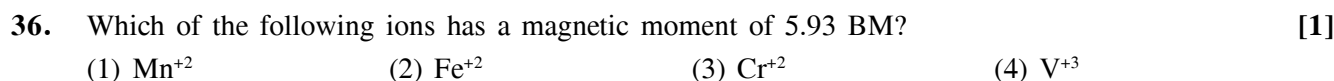
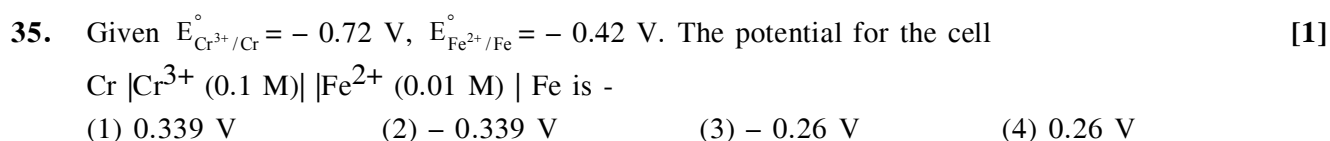
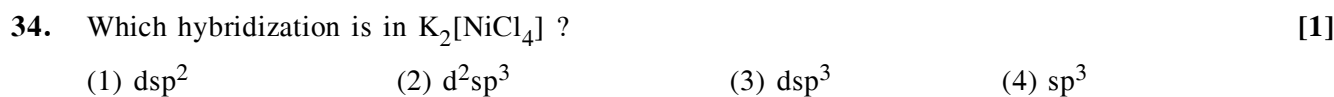
- (1) $\text{CH}_3\text{CHOHCH}_3$ (2) CH_3COCH_3 (3) $\text{C}_2\text{H}_5\text{OH}$ (4) CH_3COOH
30. Which element is not able to form $d\pi-p\pi$ bonds ? [1]
 (1) P (2) S (3) N (4) Bi

31. Which one of the following element does not form stable diatomic molecule ? [1]
 (1) Iodine (2) Phosphorus (3) Nitrogen (4) Oxygen



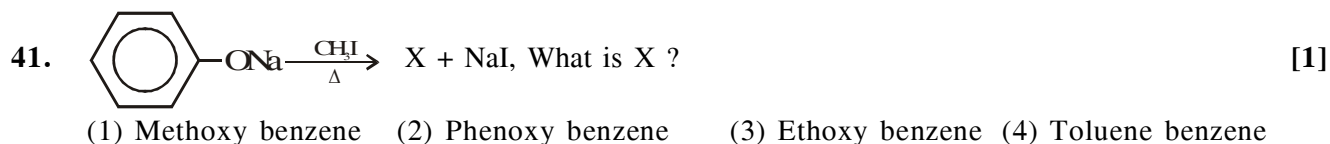
- (1) H_2SO_4 (2) Anhyd. AlCl_3 (3) Anhyd. ZnCl_2 (4) Red phosphorous
33. Which of the following is a branched polymer [1]

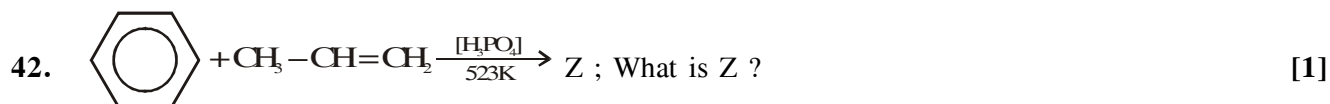
- (1) Low density polymer (2) Polyester
 (3) High density polymer (4) Nylon



In above reactions A and B are

- (1) Ln_3O_4 , LnC_2 (2) Ln_2O_3 , LnC_2 (3) Ln_2O_3 , LnC (4) Ln_2O_3 , LnC_4
40. Which of the following is a tetrabasic acid [1]
 (1) Orthophosphorus acid (2) Orthophosphoric acid
 (3) Metaphosphoric acid (4) Pyrophosphoric acid





- (1) Cumene (2) Phenol (3) Ethyl Benzene (4) None of these

43. Which reagent reduce aldehyde and ketone to Alcohol ? [1]

- (1) Sodium borohydride (NaBH₄) (2) Lithium Aluminium hydride
(3) (1) and (2) both (4) Hydrogen peroxide

44. What happened when $\text{CH}_3-\underset{\text{OH}}{\text{CH}}-\text{CH}_3$ undergo Lucas Test ? [1]

- (1) Mixture remain unreacted (2) Mixture becomes milky white within 5 minutes
(3) Oily droplets observed (4) Mixture becomes brown colored

45. Which of the following defects does KBr show? [1]

- (1) Frenkel (2) Schottky (3) Metal excess (4) Metal deficiency

46. The atoms of Y form hexagonal close packing and atoms of element X occupies $\frac{2}{3}$ portion of octahedral voids. The formula of compound formed will be : [1]

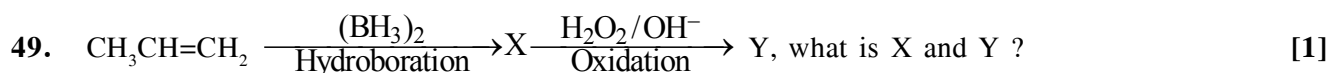
- (1) XY (2) X₃Y₂ (3) X₃Y (4) X₂Y₃

47. A solution of substance containing 1.05g per 100 ml was found to be isotonic with 3% glucose solution. The molecular mass of substance is : [1]

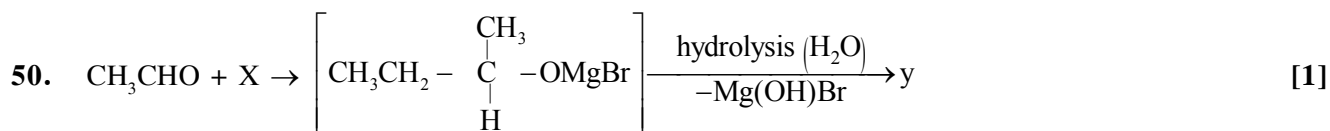
- (1) 31.5 (2) 36 (3) 68.5 (4) 63

48. $3\text{Mg}_{(s)} + \text{N}_{2(g)} \xrightarrow{\Delta} ?$ The product formed in this reaction will be : [1]

- (1) Mg₃N₂, Magnesium nitrate (2) MgN, Magnesium nitrite
(3) Mg₂N₃, Magnesium nitride (4) Mg₃N₂, Magnesium nitride



- (1) X : Tripropyl borane Y : Propan-2- ol
(2) X : Tripropyl borane Y : Propan-1- ol
(3) X : Butane - 2 - ol Y : Dipropene
(4) X : Propyl boride Y : Propane-1- ol



What is X and Y respectively ?

- (1) X : Methyl magnesium bromide Y : Butanol
(2) X : Ethyl magnesium bromide Y : Butane-2-ol
(3) X : Grignard reagent Y : Aldehyde
(4) X : Ethyl magnesium bromide Y : Butane

PART-B

Time Allowed : 2 Hour

Maximum Marks : 50

Instructions :

- Write in a clear legible handwriting.
- There are three sections in Part-B of the question paper and total 1 to 19 question are there.
- All the questions are compulsory. Internal options are given.
- Start new section on new page.
- The numbers at right side represent the marks of the question.
- Maintain sequence.

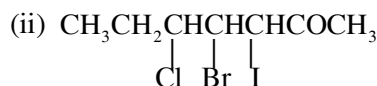
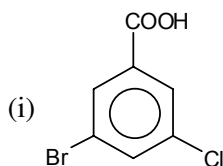
SECTION-A

❖ Answer the following (1 to 11) questions as directed in the question.

1. Define the terms : (i) Tyndall effect (ii) Brownian movement. [2]
2. Convert 4-methyl acetophenone to benzene-1,4-dicarboxylic acid. [2]
3. Draw the structures of stereoisomers of $[\text{Co}(\text{en})_2\text{Cl}_2]^+$ and $[\text{Cr}(\text{NH}_3)_3\text{Cl}_3]$. [2]

OR

- Give IUPAC names of $[\text{Cr}(\text{en})_2(\text{pn})_2]\text{Cl}_3$ and $[\text{Ag}(\text{NH}_3)_2][\text{Ag}(\text{CN})_2]$ [2]
4. Explain catalytic property of transition metals. [2]
 5. Write reaction for preparation of phosphorous trichloride. [2]
 6. Give IUPAC names : [2]



7. Write short note on Gabriel Phthalimide Synthesis. [2]
8. For how much time the electric current of 1.0 ampere be passed to obtain all the silver metal from the solution containing Ag^+ during electrolysis of 100 ml 0.02 M AgNO_3 . ($1F = 96500$ Coulombs) [2]
9. What is emulsion ? Explain its types giving examples. [2]
10. Write limitations of valence bond theory. [2]
11. Mention the name and structure of monomer of Nylon-6. [2]

SECTION-B

- ❖ Answer the following (12 to 15) questions with necessary calculations as directed in the question.
12. Explain Reimer – Tiemann Reaction [3]
13. Reaction preparation for [3]
(i) Phenyl acetate (ii) Anisole (iii) Benzene from phenol
14. Give difference between natural rubber and vulcanised rubber on following points [3]
(a) Structure (b) Properties (c) Uses
15. 2 gm of unknown substance is dissolved in 1 kg water, the depression in freezing is 0.4 K. If molal elevation constant is 4.5 K·kg·mole⁻¹. Find the molar mass of solute. [3]

SECTION-C

- ❖ Answer the following (16 to 19) questions with necessary calculations as directed in question.
16. Explain in detail the crystal field theory for a tetrahedral complex. [4]
- OR**
- Discuss hybridization, geometrical structure and magnetic properties of [MnO₄]⁻ complex ion. [4]
17. (a) Differentiate between bio-hard and bio-soft detergents giving examples. [2]
(b) Write short note on Disinfectant. [2]
18. Write the preparation of carboxylic acid from [4]
(i) Alkyl benzene
(ii) Grignard reagent
(iii) Nitrile
(iv) Ester
19. The half life period of ¹⁴C is 5370 years. In a sample of dead tree, the proportion of ¹⁴C is found to be 60% in comparison to living tree. Calculate the age of the sample. [4]

OR

- (a) For the reaction A → B, the rate of reaction becomes twenty seven times when the concentration of A is increased three times. What is the order of the reaction?
- (b) The activation energy of a reaction is 75.2 kJmol⁻¹ in the absence of a catalyst and it lowers to 50.14 kJmol⁻¹ with a catalyst. How many times will the rate of reaction grow in the presence of a catalyst if the reaction proceeds at 25°C ?
