

CET-2011

C

Sr. No. :

--

Booklet Series Code: A

Important : Please consult your Admit Card / Roll No. Slip before filling your Roll Number on the Test Booklet and Answer Sheet.

Roll No.

In Figures

In Words

--	--	--	--	--	--

O.M.R. Answer Sheet Serial No.

--	--	--	--	--	--

Signature of the Candidate : _____

Subject : Chemistry

Time : 70 minutes

Number of Questions : 60

Maximum Marks : 120

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO

INSTRUCTIONS

1. Write your Roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Subject and Series Code of Question Booklet on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point / Black Gel pen.**
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. To open the Question Booklet remove the paper seal(s) gently when asked to do so.
5. Please check that this Question Booklet contains **60** questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
6. Each question has four alternative answers (A, B, C, D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point / Black Gel pen.**
7. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Sheet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
9. Negative marking will be adopted for evaluation i.e., 1/4th of the marks of the question will be deducted for each wrong answer. A wrong answer means incorrect answer or wrong filling of bubble.
10. For calculations, use of simple log tables is permitted. Borrowing of log tables and any other material is not allowed.
11. For rough work only the sheets marked "Rough Work" at the end of the Question Booklet be used.
12. The Answer Sheet is designed for **computer evaluation.** Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e., not following the instructions completely, shall be of the candidate only.**
13. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
14. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so, would be expelled from the examination.
15. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
16. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculators is not allowed.**

1. Among the following molecules, which has the least surface tension ?
- (A) Benzene (B) Acetic acid
(C) Diethyl ether (D) Chlorobenzene
2. In a reversible adiabatic change ΔS is
- (A) Infinity (B) Zero
(C) equal to $C_v dT$ (D) equal to $nR \ln V_2/V_1$
3. Lyophobic colloids are
- (A) Reversible colloid (B) irreversible colloids
(C) protective colloids (D) proteins
4. Which of the statement is correct ?
- (A) Physical adsorption is a multilayer phenomenon
(B) Chemical adsorption is a function of adsorbate only
(C) The extent of physical adsorption increases with increase in pressure of the adsorbate and ultimately attain a limited value
(D) Physical adsorption is a monolayer phenomenon
5. 2 mol of an ideal gas expands isothermally and reversibly from 1 L to 10 L at 300 K. What is the enthalpy change ?
- (A) 4.98 K (B) 11.47 K
(C) -11.47 kJ (D) 0 kJ
6. $\text{Zn} | \text{Zn}^{2+} (0.1 \text{ M}) || \text{Fe}^{2+} (0.001 \text{ M}) | \text{Fe}$.
The emf of the above cell is 0.2905 V. The equilibrium constant for the cell reaction is
- (A) $10^{0.32/0.0591}$ (B) $10^{0.32/0.0295}$
(C) $10^{0.26/0.0295}$ (D) $10^{0.32/0.295}$
7. If all the species are in their standard states, which of the following is strongest oxidizing agent ?
- (A) Br^- (B) Zn^{2+}
(C) Fe^{2+} (D) Co^{3+}
8. However great the pressure, a gas cannot be liquefied above its
- (A) Boyle temperature (B) inversion temperature
(C) critical temperature (D) room temperature

9. Consider the equation $Z = pV/RT$. Which of the following statements is correct ?
- (A) when $Z > 1$, real gases are easier to compress than the ideal gas.
 (B) when $Z = 1$, real gases get compressed easily.
 (C) when $Z > 1$, real gases are difficult to compress.
 (D) when $Z = 1$, real gases are difficult to compress.
10. The enthalpy of neutralization of an acid by a strong base is $-57.32 \text{ kJ mol}^{-1}$. The enthalpy of formation of water is $-285.84 \text{ kJ mol}^{-1}$. The enthalpy of formation of hydroxyl ion is
- (A) $+228.52 \text{ kJ mol}^{-1}$ (B) $-114.26 \text{ kJ mol}^{-1}$
 (C) $-228.52 \text{ kJ mol}^{-1}$ (D) $+114.26 \text{ kJ mol}^{-1}$
11. Which of the following statements is incorrect ?
- (A) The entropy of an isolated system increases in an irreversible process.
 (B) The entropy of an isolated system remains unchanged in a reversible process.
 (C) Entropy can never decrease
 (D) ΔS (system) as well as ΔS (surroundings) are negative quantities
12. The unit cell of $\text{CO}_2(\text{s})$ is
- (A) fcc (B) bcc
 (C) linear (D) hcp
13. A compound alloy of gold and copper crystallizes in a cubic lattice in which the gold atoms occupy the lattice points at the corners of a cube and a copper atom occupies the centre of each cube face. The formula of this compound is
- (A) Au_3Cu (B) AuCu_3
 (C) Au_4Cu (D) AuCu_2
14. The osmotic pressures of equimolar solutions of BaCl_2 , NaCl and $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ will be in the order
- (A) $\text{NaCl} > \text{C}_{12}\text{H}_{22}\text{O}_{11} > \text{BaCl}_2$ (B) $\text{BaCl}_2 > \text{NaCl} > \text{C}_{12}\text{H}_{22}\text{O}_{11}$
 (C) $\text{NaCl} > \text{BaCl}_2 > \text{C}_{12}\text{H}_{22}\text{O}_{11}$ (D) $\text{C}_{12}\text{H}_{22}\text{O}_{11} > \text{NaCl} > \text{BaCl}_2$
15. Calculate the ebullioscopic constant for water. The heat of vapourization is $40.685 \text{ kJ mol}^{-1}$.
- (A) $0.512 \text{ K kg mol}^{-1}$ (B) $1.86 \text{ K kg mol}^{-1}$
 (C) $5.12 \text{ K kg mol}^{-1}$ (D) $3.56 \text{ K kg mol}^{-1}$
16. An acetic acid and sodium acetate buffer has $\text{pH} = 5.36$. The ratio of concentration $[\text{OAc}]/[\text{HOAc}]$ is (pK_a of acetic acid = 4.76) :
- (A) 6 : 1 (B) 4 : 3
 (C) 1 : 1 (D) 4 : 1

17. The saponification of ethyl acetate is a
- (A) Zero order (B) half order
(C) second order (D) third order
18. The rate constant, the activation energy and the pre-exponential factor of a chemical reaction at 25°C are $8.0 \times 10^{-4} \text{ s}^{-1}$, 112 kJ mol^{-1} and $4 \times 10^{15} \text{ s}^{-1}$ respectively. The value of the rate constant as $T \rightarrow \infty$ is
- (A) $8 \times 10^{16} \text{ s}^{-1}$ (B) $4 \times 10^4 \text{ s}^{-1}$
(C) $4 \times 10^{15} \text{ s}^{-1}$ (D) $112 \times 10^{12} \text{ s}^{-1}$
19. When $-\ln K$ is plotted against $1/T$ using the Van't Hoff equation, a straight line is expected with the slope equal to
- (A) $\Delta H^\circ/RT$ (B) $-\Delta H^\circ/R$
(C) $\Delta H^\circ/R$ (D) $R/\Delta H^\circ$
20. For the reaction
- $$\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$$
- The equilibrium constant K_p depends on the
- (A) Total pressure (B) Catalyst
(C) amount of H_2 and I_2 (D) temperature
21. Inductive effect involves :
- (A) Displacement of σ electrons (B) Displacement of π electrons
(C) Delocalization of π electrons (D) Delocalization of σ electrons
22. Acetone reacts with HCN to form cyanohydrine. It is an example of :
- (A) Electrophilic addition (B) Nucleophilic addition
(C) Nucleophilic substitution (D) Electrophilic substitution
23. Increasing order of stability among the three main conformations (i.e. eclipse, anti, gauche) of ethane is :
- (A) Eclipse < gauche < anti (B) Gauche < eclipse < anti
(C) Eclipse < anti < gauche (D) Anti < gauche < eclipse
24. The major product formed in the photochemical chlorination of propane is derived from :
- (A) $\text{CH}_3\overset{\bullet}{\text{C}}\text{HCH}_3$ (B) $\text{CH}_3\overset{+}{\text{C}}\text{HCH}_3$
(C) $\text{CH}_3\text{CH}_2\overset{\bullet}{\text{C}}\text{H}_2$ (D) $\text{CH}_3\text{CH}_2\overset{-}{\text{C}}\text{H}_2$

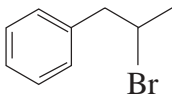
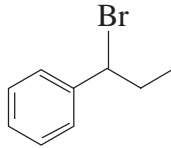
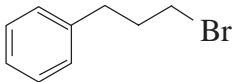
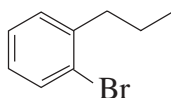
25. Acid catalyzed hydration of 2-phenyl propene gives :

- (A) 1-Phenyl-2-propanol (B) 2-Phenyl-1-propanol
(C) 3-Phenyl-1-propanol (D) 2-Phenyl-2-propanol

26. The most suitable reagent for conversion of 2-hexyne to cis-2-hexene is :

- (A) Na/liq. NH_3 (B) Lindlar catalyst
(C) $\text{LiAlH}_4/\text{THF}$ (D) Pt/H_2

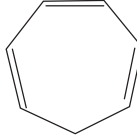
27. Major product of free radical bromination of n-propylbenzene is :

- (A)  (B) 
- (C)  (D) 

28. Which of the following gas contributes to greenhouse effect ?

- (A) Nitrogen (B) Oxygen
(C) Carbon dioxide (D) Hydrogen

29. Which of the following compounds / ions is aromatic in nature ?

- (A)  (B) 
- (C)  (D) 

30. Which of following compound is most reactive towards nucleophilic substitution through $\text{S}_{\text{N}}1$ type of mechanism ?

- (A) $\text{C}_6\text{H}_5\text{Cl}$ (B) $(\text{CH}_3)_2\text{CHCl}$
(C) $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$ (D) $(\text{CH}_3)_3\text{CCl}$

31. Which of the following combination can be used for synthesis of 2-methyl-2-butanol ?
 (A) $\text{CH}_3\text{CH}_2\text{MgBr}$ and CH_3COCH_3 (B) $\text{CH}_3\text{CH}_2\text{MgBr}$ and HCOOC_2H_5
 (C) $\text{CH}_3\text{CH}_2\text{MgBr}$ and CH_3CHO (D) $\text{CH}_3\text{CH}_2\text{MgBr}$ and $\text{CH}_3\text{CH}_2\text{OH}$
32. Phenol is heated with phthalic anhydride in presence of conc. H_2SO_4 . The product gives pink color with sodium hydroxide. The product is
 (A) Bakelite (B) Salicylic acid
 (C) Phenolphthalein (D) Resorcinol
33. Which one of the following aldehyde does not undergo Cannizzaro reaction ?
 (A) Acetaldehyde (B) Benzaldehyde
 (C) Trimethyl acetaldehyde (D) Formaldehyde
34. Phenylmagnesium bromide on reaction with carbon dioxide and subsequent hydrolysis gives :
 (A) Ethanoic acid (B) Propanoic acid
 (C) Benzoic acid (D) Benzene
35. In the following reaction sequence the product Y is :



- (A) Benzyl cyanide (B) Benzyl alcohol
 (C) Phenyl acetic acid (D) β -Phenyl ethyl amine
36. Iodobenzene ($\text{C}_6\text{H}_5\text{I}$) can be synthesized in the laboratory by
 (A) Reaction of bromobenzene with sodium iodide in dry acetone.
 (B) Reaction of phenol with hydroiodic acid.
 (C) Direct iodination of benzene.
 (D) Reaction of benzenediazonium chloride with potassium iodide.
37. α -D-(+)-glucose and β -D-(+)-glucose are
 (A) Conformers (B) Epimers
 (C) Anomers (D) Enantiomers
38. The pyrimidine bases present in DNA are :
 (A) Cytosine and Adenine (B) Cytosine and Guanine
 (C) Cytosine and Thymine (D) Cytosine and Uracil

39. Sodium salt of sulphonic acids derived from long chain alkyl benzene are important in production of :
- (A) Soaps (B) Nylon-66
(C) Detergents (D) Bakelite
40. Which of following compound is used as food preservative ?
- (A) Sodium acetate (B) Sodium bicarbonate
(C) Sodium formate (D) Sodium benzoate
41. For a d electron, the orbital angular momentum is
- (A) $\sqrt{6} \hbar$ (B) $\sqrt{2}$
(C) (D) 2
42. Which is not a water softner ?
- (A) Calgon (B) Permutit
(C) Na_2CO_3 (D) Na_2SO_4
43. Tailing of Hg is a laboratory test for
- (A) O_3 (B) Hg
(C) Cl_2 (D) O_2
44. Gun powder is
- (A) $\text{KNO}_3 + \text{charcoal} + \text{S}$ (B) $\text{NaNO}_3 + \text{KNO}_3 + \text{S}$
(C) $\text{NaNO}_3 + \text{S}$ (D) None
45. Na_2CO_3 can be manufactured by Solvey's process but K_2CO_3 cannot be prepared because
- (A) K_2CO_3 is more soluble (B) K_2CO_3 is less soluble
(C) KHCO_3 is more soluble than NaHCO_3 (D) KHCO_3 is less soluble than NaHCO_3
46. The dissolution of $\text{Al}(\text{OH})_3$ by a solution of NaOH results in the formation of
- (A) $[\text{Al}(\text{H}_2\text{O})_4(\text{OH})]^{2+}$ (B) $[\text{Al}(\text{H}_2\text{O})_2(\text{OH})_4]^-$
(C) $[\text{Al}(\text{H}_2\text{O})_3(\text{OH})_3]^{2+}$ (D) $[\text{Al}(\text{H}_2\text{O})_6(\text{OH})_3]$
47. When borax is heated strongly it gives
- (A) B_2O_3 (B) $\text{Na}_2\text{B}_4\text{O}_7$
(C) NaBO_2 (D) $\text{NaBO}_2 + \text{B}_2\text{O}_3$

48. Which of the following has highest bond energy ?
(A) C-C (B) Si-Si
(C) Ge-Ge (D) S-S
49. The commercial "22.4 volume" H_2O_2 sample has a solution with a Normality of
(A) 2.4 (B) 4.2
(C) 4.0 (D) 2.0
50. In diboranes, which of the following statements is correct regarding structure ?
(A) 4 bridged hydrogen's and two terminal hydrogen
(B) 2 bridged hydrogen's and 4 terminal hydrogen
(C) 3 bridged hydrogen's and 3 terminal hydrogen
(D) 4 bridged hydrogen's and 4 terminal hydrogen
51. Copper pyrite is concentrated by
(A) Floatation process (B) Gravity separation
(C) Distillation (D) Fractionation
52. Phosphine reacts with CuSO_4 solution to form
(A) Copper (B) Copper Phosphide
(C) Copper Phosphate (D) Copper Phosphite
53. Sodium nitrate on heating with Zn dust and caustic soda gives
(A) NaNO_2 (B) NH_3
(C) NO_2 (D) N_2O
54. The maximum bond angle in hydrides of gp. 16 elements is in
(A) H_2O (B) H_2S
(C) H_2Te (D) H_2Se
55. Ozone is formed by the interaction of water and
(A) Potassium chloride (B) Chlorine
(C) Potassium fluoride (D) Fluorine
56. Eurochlorine is a mixture of
(A) Cl_2 and SO_2 (B) Cl_2 and ClO_2
(C) Cl_2 and CO (D) None

57. Xenon tetrafluoride is

- (A) Tetrahedral (B) Square planer
(C) Pyramidal (D) Octahedral

58. The equilibrium $\text{Cr}_2\text{O}_7 + 2\text{e}^- \rightleftharpoons 2\text{CrO}_4^{2-}$ exists in

- (A) Acidic medium (B) Basic medium
(C) Neutral medium (D) It does not exist

59. For which of the following ions, the colour is not due to a d-d transition ?

- (A) CrO_4^{2-} (B) $\text{Cu}(\text{NH}_3)_4^{2+}$
(C) $\text{Ti}(\text{H}_2\text{O})_6^{3+}$ (D) CoF_6^{3-}

60. The total no. of possible isomers of the compound $[\text{Cu}(\text{NH}_3)_4][\text{PtCl}_4]$ are

- (A) 3 (B) 5
(C) 4 (D) 6

ROUGH WORK

ROUGH WORK