

Question Booklet Series: **A**

Question Booklet Serial No.: **132356**

**CET (UG) – 2019**

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

Roll No.

(In Figure)

(In Words)

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O.M.R. Answer Sheet Serial No.

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Signature of Candidate: \_\_\_\_\_

Signature of Invigilator: \_\_\_\_\_

**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 Questions Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Question Booklet Serial No. 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. The medium of examination shall be **English** only.
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 answer (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 Booklet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the question given in the Question Booklet.
9. **Negative marking will be adopted for evaluation i.e. 1/4<sup>th</sup> 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 blank sheet 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. **20 minutes** extra should be given to the visually handicapped/Person with Disability (PwD) for each paper.
16. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistant or found giving or receiving assistant 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.
17. **Tele-communication equipment such as Cellular phones, pager, wireless, scanner, camera or any electronic/digital gadget etc., is not permitted inside the examination hall. Use of calculators is not allowed.**
18. The candidates will not be allowed to leave the Examination Hall/Room before the expiry of the allotted time.

(CHE-A)

- Which of the following statement is incorrect about Werner's theory?  
A) Primary valency is the same thing as oxidation state.  
B) Secondary valency is the same thing as coordination number.  
C) Secondary valencies are satisfied by negative ions only.  
D) Secondary valencies are directional whereas primary valencies are non directional.
- If 0.5 mol of  $\text{BaCl}_2$  is mixed with 0.2 mol of  $\text{Na}_3\text{PO}_4$ , the maximum number of mole of  $\text{Ba}_3(\text{PO}_4)_2$  that can be formed is  
A) 0.7                      B) 0.5                      C) 0.30                      D) 0.10
- How many unpaired electrons are there in  $\text{Ni}^{2+}$ ?  
A) 0                      B) 2                      C) 4                      D) 8
- Rutherford's scattering experiment is related to the size of the  
A) Nucleus                      B) Atom                      C) Electron                      D) Neutron
- Which one of the following shows highest magnetic moment?  
A)  $\text{Ni}^{2+}$                       B)  $\text{Cr}^{3+}$                       C)  $\text{Fe}^{3+}$                       D)  $\text{Co}^{3+}$
- The electronegativity of the following elements increases in the order  
A) C, N, Si, P                      B) N, Si, C, P                      C) Si, P, C, N                      D) P, Si, N, C
- The types of bonds present in  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  are only  
A) Electrovalent and covalent  
B) Electrovalent and coordinate covalent  
C) Electrovalent, covalent and coordinate covalent  
D) Covalent and coordinate covalent
- Which one has the minimum dipole moment?  
A) 1-Butene                      B) *cis*-2-Butene                      C) *trans*-2-Butene                      D) 2-Methylpropene
- Equal weights of ethane and hydrogen are mixed in an empty container at  $25^\circ\text{C}$ . The fraction of the total pressure exerted by hydrogen is  
A) 1/2                      B) 1/1                      C) 1/16                      D) 15/16
- The liquid is in equilibrium with its vapours at its boiling point. On an average the molecules in the two phases have equal  
A) Potential energy                      B) Total energy                      C) Kinetic energy                      D) Intermolecular forces
- The difference between heats of reaction at constant pressure and at constant volume for the reaction  
$$2\text{C}_6\text{H}_6(l) + 15\text{O}_2(g) \rightarrow 12\text{CO}_2(g) + 6\text{H}_2\text{O}(l)$$
  
A) -7.43                      B) +3.72                      C) -3.72                      D) +7.43



12. For an endothermic reaction where  $\Delta H$  represents the enthalpy of the reaction in kJ/mole, the minimum value for the energy of activation will be  
 A) less than  $\Delta H$       B) zero      C) more than  $\Delta H$       D) equal to  $\Delta H$
13. The decomposition of  $N_2O_4$  to  $NO_2$  is carried out at 280K in chloroform. When equilibrium is reached, 0.2 mole of  $N_2O_4$  and  $2 \times 10^{-3}$  mole of  $NO_2$  are present in a 2l solution. The equilibrium constant for the reaction  

$$N_2O_4 \rightleftharpoons 2NO_2$$
 A)  $1 \times 10^{-2}$       B)  $2 \times 10^{-3}$       C)  $1 \times 10^{-5}$       D)  $2 \times 10^{-5}$
14. Solubility of a salt  $M_2X_3$  is  $x$  gm mole  $L^{-1}$ . The solubility product of the salt will be  
 A)  $x^5$       B)  $16x^2$       C)  $96x^5$       D)  $108x^5$
15. The number of electrons to balance the following equation  
 $NO_3^- + 4H^+ + e^- \rightarrow 2H_2O + NO$  is  
 A) 5      B) 4      C) 3      D) 2
16. The compound which can act both as oxidising as well as reducing agent is  
 A)  $SO_2$       B)  $MnO_2$       C)  $Al_2O_3$       D)  $CrO_3$
17. When zeolite which is hydrated sodium aluminium silicate, is treated with hard water the sodium ions are exchanged with  
 A)  $H^+$  ions      B)  $Ca^{2+}$  ions      C)  $OH^-$  ions      D)  $SO_4^{2-}$  ions
18. When same amount of zinc is treated separately with excess of sulphuric acid and excess of sodium hydroxide, the ratio of volumes of hydrogen evolved is  
 A) 1:1      B) 1:2      C) 2:1      D) 9:4
19. A solution of sodium metal in liquid ammonia is strongly reducing due to presence of  
 A) Sodium atoms      B) Sodium hydride      C) Sodium amide      D) Solvated electron
20. Magnesium is present in  
 A) Vitamin C      B) Haemoglobin      C) Chlorophyll      D) Vitamin  $B_{12}$
21. In the electrolysis of alumina, cryolite is added to  
 A) Increase the melting point of alumina      B) Increase the electrical conductivity  
 C) Minimise the anodic effect      D) Remove impurities from alumina
22. Which is not hydrolysed?  
 A)  $VCl_4$       B)  $SiF_4$       C)  $SnCl_4$       D)  $CCl_4$
23. A compound which does not give positive lassaigne's test for nitrogen is  
 A) Urea      B) Hydrazine      C) Glycine      D) Phenylhydrazine

24. Homolytic fission of C-C bond in ethane gives an intermediate in which carbon is  
 A)  $sp^3$  hybridised    B)  $sp^2$  hybridised    C)  $sp$  hybridised    D)  $sp^2d$  hybridised
25. The reaction condition leading to best yields of  $C_2H_5Cl$  are  
 A)  $C_2H_6$  (excess) +  $Cl_2 \xrightarrow[\text{light}]{UV}$   
 B)  $C_2H_6 + Cl_2 \xrightarrow[\text{room temp.}]{\text{dark}}$   
 C)  $C_2H_6 + Cl_2$  (excess)  $\xrightarrow[\text{light}]{UV}$   
 D)  $C_2H_6 + Cl_2 \xrightarrow{\Delta}$
26. Amongst the following, the compound that can be most readily sulphonated is  
 A) Benzene    B) Nitrobenzene    C) Toluene    D) Chlorobenzene
27. Which of the following is secondary pollutant?  
 A)  $CO_2$     B) CO    C)  $O_3$     D)  $SO_2$
28. Disease caused by eating fish found in water contaminated with industrial waste having mercury is  
 A) Minamata disease    B) Brights disease  
 C) Hashimotos disease    D) Osteosclerosis.
29. The 8:8 type of packing is present in  
 A) NaCl    B) KCl    C) CsCl    D)  $MgF_2$
30. Potassium has a bcc structure with nearest neighbour distance is 4.52 Å. Its atomic weight is 39. Its density will be  
 A)  $454 \text{ kg m}^{-3}$     B)  $804 \text{ kg m}^{-3}$     C)  $852 \text{ kg m}^{-3}$     D)  $910 \text{ kg m}^{-3}$
31. Blood and the solution in which blood cells remain normal i.e. retain their normal form are  
 A) Isotonic    B) Hypertonic    C) Isosmotic    D) Equinormal
32. Which of the following should be done in order to prepare 0.40 M NaCl starting with 100 mL of 0.30 M NaCl (mol. wt. of NaCl = 58.5)  
 A) Add 0.585 g of NaCl    B) Add 20 mL of water  
 C) Add 0.010 mL NaCl    D) Evaporate 10 mL of water
33. A solution of sodium sulphate in water is electrolysed using inert electrodes. The products at the cathode and anode are respectively  
 A)  $H_2, O_2$     B)  $O_2, H_2$     C)  $O_2, Na$     D)  $O_2, SO_2$

34. A solution containing one mole per litre each of  $\text{Cu}(\text{NO}_3)_2$ ,  $\text{AgNO}_3$ ,  $\text{Hg}_2(\text{NO}_3)_2$ ,  $\text{Mg}(\text{NO}_3)_2$  is being electrolysed by using inert electrodes. The values of standard potentials are  $E^0_{\text{Ag}^+/\text{Ag}} = 0.8\text{V}$ ,  $E^0_{\text{Hg}_2^{2+}/\text{Hg}} = 0.79\text{V}$ ,  $E^0_{\text{Cu}^{2+}/\text{Cu}} = 0.34\text{V}$ ,  $E^0_{\text{Mg}^{2+}/\text{Mg}} = -2.3\text{V}$  with increasing voltage the sequence of deposition of metals on the cathode will be:  
 A) Ag, Hg, Cu, Mg    B) Mg, Cu, Hg, Ag    C) Ag, Hg, Cu    D) Cu, Hg, Ag
35. The half life of a first order reaction is 69.35 seconds. The value of the rate constant of the reaction is  
 A)  $1.0\text{ s}^{-1}$     B)  $0.1\text{ s}^{-1}$     C)  $0.01\text{ s}^{-1}$     D)  $0.001\text{ s}^{-1}$
36. The rate of the reaction is doubled for every  $10^\circ$  rise in temperature. The increase in reaction rate as a result of temperature rise from  $10^\circ$  to  $100^\circ$  is  
 A) 112    B) 512    C) 400    D) 614
37. Which of the following electrolytes is least effective in causing flocculation of ferric hydroxide sol?  
 A)  $\text{K}_3[\text{Fe}(\text{CN})_6]$     B)  $\text{K}_2\text{CrO}_4$     C)  $\text{KBr}$     D)  $\text{K}_2\text{SO}_4$
38. When a colloidal solution is observed under an ultramicroscope, we can see  
 A) Light scattered by colloidal particles    B) Size of the particle  
 C) Shape of the particle    D) Relative size
39. The metallurgical process in which a metal is obtained in a fused state is called  
 A) Smelting    B) Roasting    C) Calcination    D) Amalgamation
40. Froth floatation process may be used to increase the concentration of the mineral in  
 A) Chalcopyrite    B) Bauxite    C) Haematite    D) Calamine
41. White phosphorus reacts with caustic soda. The products are  $\text{PH}_3$  and  $\text{NaH}_2\text{PO}_2$ . This reaction is an example of  
 A) Oxidation    B) Reduction  
 C) Both oxidation and reduction    D) Neutralisation
42.  $\text{Br}_2$  can be liberated from  $\text{KBr}$  solution by action of  
 A) Iodine solution    B) Chlorine water  
 C) Sodium chloride    D) Potassium iodide
43.  $\text{FeSO}_4$  forms brown ring with  
 A)  $\text{NO}$     B)  $\text{N}_2$     C)  $\text{NO}_2$     D)  $\text{N}_2\text{O}$
44. Which one of the following noble gases is least polarisable?  
 A) He    B) Ne    C) Kr    D) Xe



45. Amongst  $\text{Ni}(\text{CO})_4$ ,  $[\text{Ni}(\text{CN})_4]^{2-}$  and  $[\text{NiCl}_4]^{2-}$
- A)  $\text{Ni}(\text{CO})_4$  and  $[\text{NiCl}_4]^{2-}$  are diamagnetic and  $[\text{Ni}(\text{CN})_4]^{2-}$  is paramagnetic  
 B)  $[\text{NiCl}_4]^{2-}$  and  $[\text{Ni}(\text{CN})_4]^{2-}$  are diamagnetic and  $\text{Ni}(\text{CO})_4$  is paramagnetic  
 C)  $\text{Ni}(\text{CO})_4$  and  $[\text{Ni}(\text{CN})_4]^{2-}$  are diamagnetic and  $[\text{NiCl}_4]^{2-}$  is paramagnetic  
 D)  $\text{Ni}(\text{CO})_4$  is diamagnetic, and  $[\text{NiCl}_4]^{2-}$  and  $[\text{Ni}(\text{CN})_4]^{2-}$  are paramagnetic
46. In any ferric salt, on adding potassium ferrocyanide, a prussian blue is obtained, which is
- A)  $\text{K}_3[\text{Fe}(\text{CN})_6]$     B)  $\text{KFe}[\text{Fe}(\text{CN})_6]$     C)  $\text{FeSO}_4 \cdot \text{Fe}(\text{CN})_6$     D)  $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
47. Carbylamine test is performed in alcoholic KOH by heating mixture of
- A) Chloroform and silver powder  
 B) Trihalogenated methane and a primary amine  
 C) An alkyl halide and a primary amine  
 D) An alkyl cyanide and a primary amine
48. Chlorobenzene on fusing with solid NaOH gives
- A) Benzene    B) Benzoic acid    C) Phenol    D) Benzene chloride
49. HBr reacts faster with
- A) 2-Methyl-propan-2-ol    B) Propan-1-ol  
 C) Propan-2-ol    D) 2-Methyl propanol
50. Diethyl ether absorbs oxygen to form
- A) Red colored sweet smelling compound    B) Acetic acid  
 C) Ether suboxide    D) Ether peroxide
51. Which will give a yellow precipitate with iodine and alkali?
- A) 2-Hydroxypropane    B) Benzophenone  
 C) Methyl acetate    D) Acetamide
52. Which of the following would be expected to be most highly ionised in water?
- A)  $\text{CH}_2\text{ClCH}_2\text{CH}_2\text{COOH}$     B)  $\text{CH}_3\text{CHClCH}_2\text{COOH}$   
 C)  $\text{CH}_3\text{CH}_2\text{CCl}_2\text{COOH}$     D)  $\text{CH}_3\text{CH}_2\text{CHClCOOH}$
53. Isocyanide test is used for the detection of
- A) Primary amines    B) Primary alcohols  
 C) Secondary amines    D) Secondary alcohols
54. The product formed when phenol reacts with benzene diazonium chloride is
- A) Phenyl hydroxylamine    B) *para*-Amino azobenzene  
 C) Phenyl hydrazine    D) *para*-Hydroxy azobenzene

55. Starch can be used as an indicator for the detection of traces of
- A) Glucose in aqueous solution                      B) Proteins in blood  
C) Iodine in aqueous solution                      D) Urea in blood
56. Proteins fulfil several functions in living systems. An example of a protein which acts as a hormone is
- A) Casein                      B) Oxytocin                      C) Trypsin                      D) Keratin
57. Which one of the following can be used as monomer in a polymerisation reaction?
- A)  $C_2H_3Cl$                       B)  $C_2H_6O$                       C)  $C_6H_6$                       D)  $C_3H_6$
58. 2,4-Dichlorophenoxy acetic acid is used as
- A) Fungicide                      B) Insecticide                      C) Herbicide                      D) Moth repellent
59. Choose the correct I.U.P.A.C. name for
- $$\begin{array}{c} CH_3-CH-CHO \\ | \\ CH_2CH_3 \end{array}$$
- A) Butan-2-aldehyde                      B) 2-Methylbutanal  
C) 3-Methyl isobutyraldehyde                      D) 2-Ethylpropanal
60. Toilet soap is made up of:
- A) Calcium and sodium salts of fatty acids                      B) Fatty acids and glycerol  
C) Calcium salts of fatty acids                      D) Potassium salts of fatty acids

X-X-X