COMMON ENTRANCE TEST - 2005

DATE	SUBJECT	TIME
04 - 05 - 2005	CHEMISTRY	02.30 PM to 03.50 PM

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
60	80 MINUTES	70 MINUTES

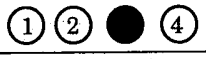
MENTION YOUR CET NUMBER	QUESTION BOOKLET DETAILS	
	VERSION CODE	SERIAL NUMBER
	A - 1	015953

IMPORTANT INSTRUCTIONS TO CANDIDATES

(Candidates are advised to read the following instructions carefully, before answering on the OMR answer sheet.)

1. Ensure that you have entered your Name and CET Number on the top portion of the OMR answer sheet.
2. **ENSURE THAT THE TIMING MARKS ON THE OMR ANSWER SHEET ARE NOT DAMAGED / MUTILATED / SPOILED.**
3. This Question Booklet is issued to you by the invigilator after the 2nd Bell. i.e., after 02.35 p.m.
4. Carefully enter the Version Code and Serial Number of this question booklet on the top portion of the OMR answer sheet.
5. As answer sheets are designed to suit the Optical Mark Reader (OMR) system, please take special care while filling the entries pertaining to CET Number and Version Code.
6. Until the 3rd Bell is rung at 02.40 p.m. :
   - Do not remove the staple present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.
7. After the 3rd Bell is rung at 02.40 p.m., remove the staple present on the right hand side of this question booklet and start answering on the bottom portion of the OMR answer sheet.
8. This question booklet contains 60 questions and each question will have four different options / choices.
9. During the subsequent 70 minutes :
   - Read each question carefully.
   - Determine the correct answer from out of the four available options / choices given under each question.
   - **Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALLPOINT PEN against the question number on the OMR answer sheet.**

CORRECT METHOD OF SHADING THE CIRCLE ON THE OMR SHEET IS AS SHOWN BELOW :



10. Please note that :
    - For each correct answer : ONE mark will be awarded.
    - For each wrong answer : QUARTER (1/4) mark will be deducted.
    - If more than one circle is shaded : ONE mark will be deducted.
    - **Even a minute unintended ink dot on the OMR sheet will also be recognised and recorded by the scanner. Therefore, avoid multiple markings of any kind.**
11. Use the space provided on each page of the question booklet for Rough work AND do not use the OMR answer sheet for the same.
12. After the last bell is rung at 03.50 p.m., stop writing on the OMR answer sheet.
13. Hand over the OMR ANSWER SHEET to the room invigilator as it is.
14. After separating and retaining the top sheet (CET Cell Copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
15. **Preserve the replica of the OMR answer sheet for a minimum period of One year.**

CHEMISTRY

1. A mixture of two moles of carbon monoxide and one mole of oxygen, in a closed vessel is ignited to convert the carbon monoxide to carbon dioxide. If ΔH is the enthalpy change and ΔE is the change in internal energy, then,
   1) $\Delta H > \Delta E$
   2) $\Delta H < \Delta E$
   3) $\Delta H = \Delta E$
   4) the relationship depends on the capacity of the vessel

2. The cooling in refrigerator is due to .....
   1) Reaction of the refrigerator gas
   2) Expansion of ice
   3) The expansion of the gas in the refrigerator
   4) The work of the compressor

3. For a system in equilibrium, $\Delta G = 0$, under conditions of constant .....
   1) temperature and pressure
   2) temperature and volume
   3) pressure and volume
   4) energy and volume

4. Molar heat of vaporisation of a liquid is 6 kJ $mole^{-1}$. If the entropy change is 16 J $mole^{-1} K^{-1}$, the boiling point of the liquid is .....
   1) 375^0 C
   2) 375 K
   3) 273 K
   4) 102^0 C

5. The temperature of the system decreases in an .....
   1) adiabatic compression
   2) isothermal compression
   3) isothermal expansion
   4) adiabatic expansion

(Space for Rough Work)

6. 15 moles of H_2 and 5.2 moles of I_2 are mixed and allowed to attain equilibrium at 500°C. At equilibrium, the concentration of HI is found to be 10 moles. The equilibrium constant for the formation of HI is .....

1) 50 2) 15
3) 100 4) 25

7. If, in the reaction $N_2O_4 \leftrightarrow 2NO_2$, x is that part of N_2O_4 which dissociates, then the number of molecules at equilibrium will be

1) 1 2) 3
3) $(1 + x)$ 4) $(1 + x)^2$

8. Which of these does not influence the rate of reaction ?

1) Nature of the reactants 2) Concentration of the reactants
3) Temperature of the reaction 4) Molecularity of the reaction

9. For the reaction $A + B \rightarrow C$, it is found that doubling the concentration of A increases the rate by 4 times, and doubling the concentration of B doubles the reaction rate. What is the overall order of the reaction ?

1) 4 2) $3/2$
3) 3 4) 1

10. The rate at which a substance reacts depends on its .....

1) atomic weight 2) atomic number
3) molecular weight 4) active mass

(Space for Rough Work)

11. For the reaction $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$, the value of K_C at 800°C is 0.1. When the equilibrium concentrations of both the reactants is 0.5 mol, what is the value of K_p at the same temperature ?

1) 0.5 2) 0.1
3) 0.01 4) 0.025

12. The extent of adsorption of a gas on a solid depends on .....

1) nature of the gas 2) pressure of the gas
3) temperature of the gas 4) all are correct

13. An emulsifier is a substance which .....

1) stabilises the emulsion 2) homogenises the emulsion
3) coagulates the emulsion 4) accelerates the dispersion of liquid in liquid

14. Which of the following types of metals form the most efficient catalysts ?

1) alkali metals 2) alkaline earth metals
3) transition metals 4) all the above

15. The species among the following, which can act as an acid and a base is .....

1) $HSO_4^{\ominus}$ 2) SO_4^{2-}
3) $H_3O^{\oplus}$ 4) $Cl^{\ominus}$

(Space for Rough Work)

16. A buffer solution has equal volumes of 0.2M NH_4OH and 0.02 M NH_4Cl. The p^{kb} of the base is 5. The pH is .....

1) 10 2) 9
3) 4 4) 7

17. The hydrogen electrode is dipped in a solution of pH 3 at 25°C. The potential would be (the value of 2.303 RT/F is 0.059 V)

1) 0.177 V 2) 0.087 V
3) 0.059 V 4) – 0.177 V

18. 20 ml of 0.5 N HCl and 35 ml of 0.1N $NaOH$ are mixed. The resulting solution will .....

1) be neutral 2) be basic
3) turn phenolphthalein solution pink 4) turn methyl orange red

19. Corrosion of iron is essentially an electrochemical phenomenon where the cell reaction are .....

1) Fe is oxidised to Fe^{2+} and dissolved oxygen in water is reduced to $\overset{\ominus}{O}H$
2) Fe is oxidised to Fe^{3+} and H_2O is reduced to O_2^{2-}
3) Fe is oxidised to Fe^{2+} and H_2O is reduced to O_2^-
4) Fe is oxidised to Fe^{2+} and H_2O is reduced to O_2

20. The standard electrode potential is measured by .....

1) Electrometer 2) Voltmeter
3) Pyrometer 4) Galvanometer

(Space for Rough Work)

21. A precipitate of $AgCl$ is formed when equal volumes of the following are mixed. $[K_S$ for $AgCl = 10^{-10}]$

1) 10^{-4} M $AgNO_3$ and 10^{-7} M HCl
2) 10^{-5} M $AgNO_3$ and 10^{-6} M HCl
3) 10^{-5} M $AgNO_3$ and 10^{-4} M HCl
4) 10^{-6} M $AgNO_3$ and 10^{-6} M HCl

22. Which one of the following defects in the crystals lowers its density ?

1) Frenkel defect
2) Schottky defect
3) F-centres
4) Interstitial defect

23. A radioactive isotope has a half life of 10 days. If today 125 mg is left over, what was its original weight 40 days earlier ?

1) 2 g
2) 600 mg
3) 1 g
4) 1.5 g

24. Which of the particles cannot be accelerated ?

1) α - particle
2) β - particle
3) Protons
4) Neutrons

25. In which of the following nuclear reactions neutron is emitted ?

1) ${}^{27}_{13}Al + {}^{4}_{2}He \rightarrow {}^{30}_{15}P$
2) ${}^{12}_{6}C + {}^{1}_{1}H \rightarrow {}^{13}_{7}N$
3) ${}^{30}_{15}P \rightarrow {}^{30}_{14}Si$
4) ${}^{241}_{96}Am + {}^{4}_{2}He \rightarrow {}^{245}_{97}Bk$

(Space for Rough Work)

26. Gold is extracted by hydrometallurgical process, based on its property .....

1) of being electropositive
2) of being less reactive
3) to form complexes which are water soluble
4) to form salts which are water soluble

27. In blast furnace, iron oxide is reduced by .....

1) Hot blast of air
2) Carbon monoxide
3) Carbon
4) Silica

28. Which of the following pairs of elements cannot form an alloy ?

1) Zn, Cu
2) Fe, Hg
3) Fe, C
4) Hg, Na

29. Which compound is zero valent metal complex ?

1) $[Cu(NH_3)_4]SO_4$
2) $[Pt(NH_3)_2 Cl_2]$
3) $[Ni(CO)_4]$
4) $K_3[Fe(CN)_6]$

30. Alum is a water purifier because it .....

1) coagulates the impurities.
2) softens hard water
3) gives taste
4) destroys the pathogenic bacteria

(Space for Rough Work)

31. A compound A has a molecular formula C_2Cl_3OH . It reduces Fehling's solution and on oxidation, gives a monocarboxylic acid B. A can be obtained by the action of chlorine on ethyl alcohol. A is .....

1) chloroform
2) chloral
3) methyl chloride
4) monochloro acetic acid

32. Which of the following haloalkanes is most reactive ?

1) 1-chloropropane
2) 1-bromopropane
3) 2-chloropropane
4) 2-bromopropane

33. The reaction in which phenol differs from alcohol is .....

1) it undergoes esterification with carboxylic acid
2) it reacts with ammonia
3) it forms yellow crystals of iodoform
4) it liberates H_2 with Na metal

34. An organic compound A containing C, H and O has a pleasant odour with boiling point of 78^0C. On boiling A with conc. H_2SO_4, a colourless gas is produced which decolourises bromine water and alkaline $KMnO_4$. The organic liquid A is .....

1) C_2H_5Cl
2) $C_2H_5COOCH_3$
3) C_2H_5OH
4) C_2H_6

35. Which of the following is an amphoteric acid ?

1) Glycinc
2) Salicylic acid
3) Benzoic acid
4) Citric acid

(Space for Rough Work)

36. Benzyl alcohol and sodium benzoate is obtained by the action of sodium hydroxide on benzaldehyde. This reaction is known as .....

1) Perkin's reaction
2) Cannizzaro's reaction
3) Sandmeyer's reaction
4) Claisen condensation

37. Ethyl chloride on heating with $AgCN$, forms a compound 'X'. The functional isomer of 'X' is-

1) $C_2 H_5 NC$
2) $C_2 H_5 NH_2$
3) $C_2 H_5 CN$
4) None of the above

38. A compound, containing only carbon, hydrogen and oxygen, has a molecular weight of 44. On complete oxidation it is converted into a compound of molecular weight 60. The original compound is .....

1) an aldehyde
2) an acid
3) an alcohol
4) an ether

39. Grignard reagent adds to .....

1) $>C = 0$
2) $-C \equiv N$
3) $>C = S$
4) all of the above

40. Which of the following biomolecules contain a non-transition metal ion ?

1) Vitamin B_{12}
2) Chlorophyll
3) Haemoglobin
4) Insulin

(Space for Rough Work)

41. Three dimensional molecules with cross links are formed in the case of a .....
    1) Thermoplastic 2) Thermosetting plastic
    3) Both 4) None

42. Sucrose molecule is made up of .....
    1) a gluco pyranose and a fructo pyranose
    2) a gluco pyranose and a fructo furanose
    3) a gluco furanose and a fructo pyranose
    4) a gluco furanose and a fructo furanose

43. Water insoluble component of starch is .....
    1) amylopectin 2) amylose
    3) cellulose 4) none of the above

44. An example for a saturated fatty acid, present in nature is .....
    1) Oleic acid 2) Linoleic acid
    3) Linolenic acid 4) Palmitic acid

45. A Nanopeptide contains ..... peptide linkages.
    1) 10 2) 8
    3) 9 4) 18

(Space for Rough Work)

46. An example of a sulphur containing amino acid is .....

1) Lysine 2) Serine
3) Cysteine 4) Tyrosine

47. Which of the following is not present in a nucleotide ?

1) cytosine 2) guanine
3) adenine 4) tyrosine

48. Antiseptic chloroxylenol is .....

1) 4 - chloro - 3, 5 - dimethyl phenol 2) 3 - chloro - 4, 5 - dimethyl phenol
3) 4 - chloro - 2, 5 - dimethyl phenol 4) 5 - chloro - 3, 4 - dimethyl phenol

49. An atom of an element A has three electrons in its outermost orbit and that of B has six electrons in its outermost orbit. The formula of the compound between these two will be .....

1) $A_3 B_6$ 2) $A_2 B_3$
3) $A_3 B_2$ 4) $A_2 B$

50. Among Na^+, Na, Mg and Mg^{2+}, the largest particle is .....

1) Mg^{2+} 2) Mg
3) Na 4) Na^+

(Space for Rough Work)

51. Molarity of 0.2 N H_2SO_4 is .....

1) 0.2 2) 0.4
3) 0.6 4) 0.1

52. In the equation of state of an ideal gas $PV = nRT$, the value of the universal gas constant would depend only on .....

1) the nature of the gas 2) the pressure of the gas
3) the units of the measurement 4) None of the above

53. A commercial sample of hydrogen peroxide is labelled as 10 volume. Its percentage strength is nearly .....

1) 1% 2) 3%
3) 10% 4) 90%

54. Activated charcoal is used to remove colouring matter from pure substances. It works by .....

1) oxidation 2) reduction
3) bleaching 4) adsorption

55. When plants and animals decay, the organic nitrogen is converted into inorganic nitrogen. The inorganic nitrogen is in the form of .....

1) Ammonia 2) Elements of nitrogen
3) Nitrates 4) Nitrides

(Space for Rough Work)

56. A gas decolourised by $KMnO_4$ solution but gives no precipitate with ammonical cuprous chloride is .....

1) Ethane
2) Methane
3) Ethene
4) Acetylene

57. $H_3C - \underset{\underset{Cl}{|}}{C} = CH - \underset{\underset{CH_3}{|}}{CH} - CH_3$ is

1) 2-chloro-4-methyl-2-pentene
2) 4-chloro-2-methyl-3-pentene
3) 4-methyl-2-chloro-2-pentene
4) 2-chloro-4,4-dimethyl-2-butene

58. Amongst the following, the compound that can most readily get sulphonated is ?

1) Benzene
2) Toluene
3) Nitrobenzene
4) Chlorobenzene

59. Household gaseous fuel (LPG) mainly contains .....

1) CH_4
2) C_2H_2
3) C_2H_4
4) C_4H_{10}

60. Use of chlorofluoro carbons is not encouraged because .....

1) they are harmful to the eyes of people that use it.
2) they damage the refrigerators and air conditioners.
3) they eat away the ozone in the atmosphere.
4) they destroy the oxygen layer.

(Space for Rough Work)

(Space for Rough Work)

A-1