C1	Maximum Marks: 60 Total No. of Questions: 60 Total Duration: 80 Minutes Maximum Time for Answering: 70 Minutes Date: _____/_____/_____	**YOUR COLLEGE NAME HERE** 
	MENTION YOUR NUMBER	

VERSION CODE						**Subject Code**	**GT-C-01**
25UGE(MOCK)							

Do's:

1. Check whether the CET Number has been entered and shaded in the respective circles on the OMR answer sheet.
2. The version code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
3. The Version Code and Serial number of this question booklet should be entered on the Nominal Roll without any mistakes.
4. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts:

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**

- Do not remove the seal present on the right-hand side of this question booklet.
  - Do not; look inside this question booklet or start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. In case of usage of signs and symbols in the questions, the regular textbook connotation should be considered unless stated otherwise.
2. This question booklet contains 60 questions and each question will have one statement and four different options / responses and out of which you have to choose one correct answer.
3. Remove the paper seal of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., If so, get if replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
4. 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	WRONG METHOD
(A) ● (C) (D)	⊗ (B) (C) (D) (A) (B) (C) ✓ (D) (A) ● ● (D) ☛ (B) (C) (D) (A) ● (C) (D)

5. Please note that even a, minute unintended ink dot on the OMR answer sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
6. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
7. Hand over the **OMR** answer sheet to the room invigilator as the final bell rings.

Name of candidate (in capitals): _____

Roll Number: _____ Invigilator's Signature:_____

1. Values of $\frac{e}{m}\left[\frac{charge}{mass}\right]$ in the categories alpha particle (α), electron (e) and protons (p) increase in the order:
(1) $p < e < \alpha$ (2) $\alpha < p < e$
(3) $e < \alpha < p$ (4) $\alpha < e < p$

2. Pairing of electrons in the orbitals belonging to the same subshell (p, d or f) does not take place until each orbital belonging to that subshell is singly occupied. This is called
(1) Pauli's exclusion principle
(2) Hund's rule of maximum multiplicity
(3) Aufbau principle
(4) Hund's rule of minimum multiplicity

3. Which of the following is most powerful oxidizing agent in the following:
(1) $KMnO_4$ (2) $K_2Cr_2O_7$
(3) O_3 (4) H_2O_2

4. Using the standard electrode potential, find out the pair between which redox reactions is not feasible.
$E^{!}$ values: $\frac{Fe^{3+}}{Fe^{2+}}$ = +0.77; $\frac{I^2}{I^-}$ (s) = +0.54;
$\frac{Cu^{2+}}{Cu}$ = +0.34; $\frac{Ag^+}{Ag}$ = +0.80V
(1) Ag and Fe^{3+} (2) Fe^{3+} and Cu
(3) Ag^+ and Cu (4) Fe^{3+} and I^-

5. The temperature at which the vapour pressure of a liquid equals external pressure is called:
(1) m.p (2) f.p
(3) critical temperature (4) b.p

6. To neutralize completely 20 ml of 0.1 M aqueous solution of phosphorus acid (H_3PO_3) the volume of 0.1M aqueous KOH solution required is
(1) 40 mL (2) 20 mL
(3) 10 mL (4) 60 mL

7. An azeotropic mixture of two liquids has a boiling point higher than either of the two liquids when it:
(1) Obeys Raoult's law.
(2) Shows large positive deviation from Raoult's law.
(3) Shows no deviation from Raoult's law.
(4) Shows large negative deviation from Raoult's law.

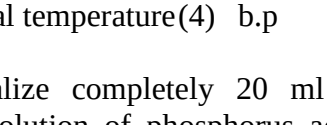
8. The osmotic pressure of a solution containing 0.02 mole of solute at 300 K will be:
(1) $0.02 \times 0.0821 \times 300\, atm$
(2) $\frac{0.02 \times 300}{0.0821} atm$
(3) $0.03 \times 0.821 \times 300\, atm$
(4) $\frac{0.02 \times 0.0821}{300} atm$

9. Benzaldehyde and acetone can be best distinguished by using:
(1) Hydrazine
(2) Tollen's reagent
(3) 2, 4 – DNP reagent
(4) Sodium hydroxide solution

10. How to do the following conversion:
RCOOCl +? $\rightarrow$ RCHO
(1) Using H_2 - Pd, $BaSO_4$
(2) Using DIBAL - H
(3) Using H_2 - Pd
(4) Using $NaBH_4$

11. Aldol condensation will not take place in:
(1) CH_3CHO (2) CH_3COCH_3
(3) HCHO (4) CH_2CH_2CHO

12. What is the correct IUPAC name of the given compound?



(1) 2 - Carboxyl - 2 - methylbutane
(2) 2 - Ethyl - 2 - methylpropanoic acid
(3) 3 - Methylbutane carboxylic acid
(4) 2,2 - Dimethylbutanoic acid

13. The correct decreasing order of the boiling points of given compounds is
(1) HF > H_2O > NH_3 (2) NH_3 > H_2O > HF
(3) NH_3 > HF > H_2O (4) H_2O > HF > NH_3

14. The shape of SF_4 molecule is
(1) square planar
(2) see - saw
(3) trigonal bi - pyramidal
(4) bent

15. Aniline does not undergo Friedel – Crafts reaction because:
(1) Anilium ion deactivates any further reaction
(2) Aluminium chloridereacts with Aniline
(3) All of these
(4) $AlCl_3$ act as a catalyst

16. Amongst the given set of reactants, the most appropriate for preparing 2º amine is _____.
(1) 1º R - NH_2 + RCHO followed by H_2/Pt
(2) 1º R - Br (2 mol) + potassium phthalimide followed by H_3O^+/heat
(3) 2º R - Br + NaCN followed by H_2/Pt
(4) 2º R - Br + NH_3

17. Three compounds are given below:
$\underset{I}{(C_2H_5)_3N}, \underset{II}{C_2H_5NH_2}, \underset{III}{(C_2H_5)_2NH}$
Identify the correct decreasing order of their basic strength in gas phase:
(1) I > III > II (2) III > I > II
(3) III > II > I (4) II > III > I

18. Consider the reactions given below. On the basis of these reactions find out which of the algebraic relations given in options (i) to (iv) is correct?
C (g) + 4 H (g) $\rightarrow CH_4(g); \Delta_r H = xkJmol^{-1}$
C(graphite's) + $2H_2(g) \rightarrow CH_4(g); \Delta_r H = ykJmol^{-1}$
(1) x = y (2) x = 2y
(3) x < y (4) x > y

19. Select the incorrect expression from the following.
(1) $\Delta S_{total} < 0$ (spontaneous process)
(2) $\Delta G = \Delta H - T\Delta S$
(3) $\Delta S_{total} = \Delta S_{system} + \Delta S_{surr}$
(4) $\Delta S_{surr} = \frac{\Delta H_{surr}}{T} = -\frac{\Delta H_{sys}}{T}$

20. In the button cells widely used in watches and other devices the following reaction takes place:
$Zn_{(s)} + Ag_2O_{(s)} + H_2O_{(l)} \rightarrow Zn^{2+}_{(aq)} + 2Ag_{(s)} + 2OH^-_{(aq)}$
[Given E^0 Zn^{2+}/Zn = - 0.76V,
E^0 Ag_2O/Ag = +0.344V]
Determine Eº cell for the reaction.
(1) 1.104 V (2) 1.005 V
(3) 0.913 V (4) 1.159 V

21. Which of the following is affected by catalyst?
(1) E_a (2) ΔG
(3) ΔH (4) ΔS

22. Choose the one which is a secondary cell:
(1) Leclanche cell
(2) Both Laclanche cell and Mercury cell
(3) Mercury cell
(4) Lead - storage battery cell

23. Consider the following cell reaction:
$2Fe_{(s)} + O_2 + 4H^+(aq) \rightarrow 2Fe^{2+}(aq) + 2H_2O(l)$;
E^0 = 1.67V
At[Fe^{2+}] = 10^{-3} M, P(O_2) = 0.1atm
And pH = 3, the cell potential at 25°C is
(1) 1.87 V (2) 1.77 V
(3) 1.47 V (4) 1.57 V

24. Glucose is:
(1) Aldopentose (2) Ketopentose
(3) Aldohexose (4) Ketohexose

25. The vitamin that cannot be stored in our body is
(1) vitamin E (2) vitamin C
(3) vitamin K (4) vitamin D

26. Cheilosis is caused by deficiency of
(1) Vitamin B_6 (2) Vitamin B_2
(3) Vitamin C (4) Vitamin B_{12}

27. Which of the following oxidation state is common for all lanthanoids?
(1) + 5 (2) + 2
(3) + 4 (4) + 3

28. Which of the following reactions are disproportionation reactions?
a. $Cu^{+} \rightarrow Cu^{2+} + Cu$
b. $3MnO_4^{-} + 4H^{+} \rightarrow 2MnO_4^{-} + MnO_2 + 2H_2O$
c. $2KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$
d. $2MnO_4^{-} + 3Mn^{2+} + 2H_2O \rightarrow 5MnO_2 + 4H^{+}$
(1) a, b, c (2) b, c, d
(3) a, b (4) a, d

29. Which set of ions exhibit specific colours? (Atomic number of Sc = 21, Ti = 22, V = 23, Mn = 25, Fe = 26, Ni = 28, Cu = 29 and Zn = 30)
(1) Sc^{3+}, Zn^{2+}, Ni^{2+} (2) Ti^{3+}, Ti^{4+}, Ni^{2+}
(3) Sc^{3+}, Ti^{4+}, Mn^{3+} (4) V^{3+}, V^{2+}, Fe^{3+}

30. Which of the following characteristics of transition metals is associated with their catalytic activity?
(1) Paramagnetic nature
(2) High enthalpy of atomisation
(3) Variable oxidation states
(4) Colour of hydrated ions

31. The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. What will be the molecular formula of the compound?
(1) $C_6H_{12}O_6$ (2) $C_2H_4O_2$
(3) CH_2O (4) $C_9H_{18}O_9$

32. Which law states that if two elements can combine to form more than one compound, the masses of one element that combine with a fixed mass of other element, are in the ratio of small whole numbers?
(1) Avogadro's law
(2) Law of multiple proportions
(3) Law of definite composition
(4) Gay Lussac's law of gaseous volumes

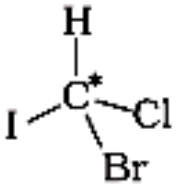
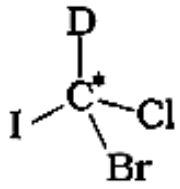
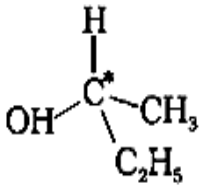
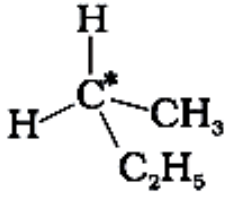
33. K_a for CH_3COOH is 1.8×10^{-5} and K_b for NH_4OH is 1.8×10^{-5}. The pH of ammonium acetate will be
(1) 4.75 (2) Between 6 and 7
(3) 7.005 (4) 7.0

34. In the equilibrium, AB $\leftrightarrow$ A + B, if the equilibrium concentration of A is double, then equilibrium concentration of B will be
(1) $\frac{1}{8}th$ (2) $\frac{1}{4}th$
(3) twice (4) half

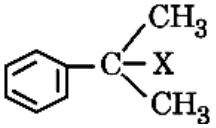
35. Find K_c for the following reaction, if CO_2 pressure is in atmospheres:
$CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$,
$K_p = 2.1 \times 10^{-4}$ (at 1000K).
(1) 2.6×10^{-6} (2) 1.1×10^{-6}
(3) 4.1×10^{-6} (4) 2.4×10^{-6}

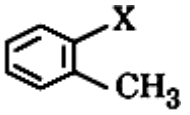
36. The atomic number of the element unnilennium is:
(1) 102 (2) 109
(3) 119 (4) 108

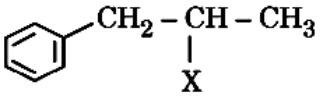
37. In the modern periodic table, the period indicates the value of:
(1) azimuthal quantum number
(2) principal quantum number
(3) mass number
(4) atomic number

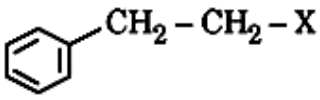
38. In which of the following molecules carbon atom marked with an asterisk (*) is asymmetric?
(a) 
(b) 
(c) 
(d) 
(1) (b), (c), (d) (2) (a), (b), (c)
(3) (a), (b), (c), (d) (4) (a), (c), (d)

39. Which of the following is a benzylic halide?

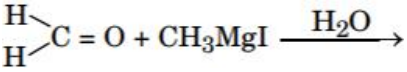
(1) 

(2) 

(3) 

(4) 

40. What would be the major product of the given reaction?



(1) Ethanol (2) Ethanal
(3) Propanol (4) Propanal

41. Which is the correct increasing order of boiling points of the following compounds?
1- Iodobutane,1- Bromobutane,1- Chlorobutane, Butane
(1) Butane < 1- Iodobutane < 1- Bromobutane < 1- Chlorobutane
(2) Butane < 1- Chlorobutane < 1- Iodobutane < 1- Bromobutane
(3) Butane < 1- Chlorobutane < 1- Bromobutane < 1- Iodobutane
(4) 1- Iodobutane < 1- Bromobutane < 1- Chlorobutane < Butane

42. The magnetic moment of $[NiCl_4]^{2-}$
[Atomic number : Ni = 28]
(1) 2.82 BM (2) 4.42 BM
(3) 5.46 BM (4) 1.82 BM

43. Identify Prussian blue from the following:
(1) $Fe_3[Fe(CN)_6]_4$ (2) $Fe_2[Fe(CN)_6]$
(3) $Fe_4[Fe(CN)_6]$ (4) $Fe_4[Fe(CN)_6]_3$

44. What is the coordination number of central metal ion in $[Fe(C_2O_4)_3]^{3-}$?
(1) 6 (2) 4
(3) 5 (4) 3

45. The octahedral complex trioxalatochromate(III) will show
(1) Structural isomerism
(2) Optical isomerism
(3) Linkage isomerism
(4) Geometrical isomerism

46. In a chemical reaction X $\rightarrow$ Y, it is found that the rate of reaction doubles when the concentration of X is increased four times. The order of the reaction with respect to X is
(1) $\frac{1}{2}$ (2) 2
(3) 1 (4) 0

47. In the formation of sulphur trioxide
$2SO_2(g) + O_2(g) \leftrightarrow 2SO_3(g)$.The rate of reaction is expressed as $-\frac{d[O2]}{dt} = 2.5\times10^{-4} molL^{-1}s^{-1}$.
The rate of disappearance of SO_2 will be
(1) 50.0×10^{-4} mol L^{-1} s^{-1}
(2) 3.75×10^{-4} mol L^{-1} s^{-1}
(3) -2.25×10^{-4} mol L^{-1} s^{-1}
(4) 5×10^{-4} mol L^{-1} s^{-1}

48. The reaction $2NO+Br_2 \rightarrow 2NOBr$ follows the mechanism given below:
$NO + Br_2 \leftrightarrow NOBr_2$ (fast)
$NOBr_2 + NO \rightarrow 2NOBr$ (slow)
If the concentration of both NO and Br_2 is increased two times, the rate of reaction would become:
(1) 2 times (2) 8 times
(3) 4 times (4) 6 times

49. Which among the following is an example of first order reaction?
(1) Inversion of cane sugar
(2) Formation and dissociation of ozone
(3) Decomposition of nitrogen pentoxide
(4) Acid catalysed hydrolysis of ethyl acetate

50. For a zero-order reaction, the slope in the plot of [R] vs. time is (where, [R] is the final concentration of reactant)
(1) - k (2) $\frac{-k}{2.303}$
(3) +k (4) $\frac{+k}{2.303}$

51. Monochlorination of toluene in sunlight followed by hydrolysis by aq. NaOH yields
(1) benzyl alcohol
(2) o - cresol
(3) 2,4 - dihydroxytoluene
(4) m - cresol

52. For the conversion of propene into 1 - propanol, which of the following reagents and conditions should be used?
(1) B_2H_6; H_2O_2/OH^-
(2) H_2O/H^+
(3) Dilute H_2SO_4
(4) Conc. H_2SO_4; H_2O and heat

53. Which of the following alkenes on acid catalysed hydration gives a tertiary alcohol?
(1) 1 - Butene (2) 2 - Methylpropene
(3) 2 - Butene (4) Propene

54. One mole of an organic compound 'A' with the formula C_3H_8O reacts completely with two moles of HI to form X and Y. When 'Y' is boiled with aqueous alkali forms Z. Z answers the iodoform test. The compound 'A' is _____.
(1) methoxyethane (2) ethoxyethane
(3) Propan – 2 – o1 (4) Propan – 1 – o1

55. The increasing order of reduction of alkyl halides with zinc and dilute HCl is
(1) R–Cl < R–Br < R–I
(2) R–I < R–Br < R–Cl
(3) R–Br < R–I < R–Cl
(4) R–Cl < R–I < R–Br

56. Which of the following has higher dipole moment; cis - 2 - butene and trans - 2 - butene?
(1) trans - but - 2 - ene
(2) Both have differentdipole moment
(3) cis - but - 2 - ene
(4) Both have same dipole moment

57. N_2, CO, and NO^+ are isoelectronic molecules. Their respective bond orders are:
(1) 3,3,3 (2) 1,1,3
(3) 2,3,4 (4) 2,3,3

58. Out of the following, intramolecular hydrogen bonding exists in.
(1) 2 - nitrophenol (2) Water
(3) H_2S (4) 4 - nitrophenol

59. The axial overlap between the two orbitals leads to the formation of a
(1) pi bond (2) Ionic bond
(3) sigma bond (4) multiple bond

60. Which of the following is a Metalloid?
(1) Phosphorus (2) Antimony
(3) Nitrogen (4) Bismuth

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK