1

SUBJECT	TIME
CHEMISTRY	02.30 P.M. TO 03.50 P.M.

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	603489

DO's :

1. Check whether the CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the invigilator after the 2nd Bell i.e., after 02.30 p.m.
3. The Serial Number of this question booklet should be entered on the OMR answer sheet.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'TS :

1. **THE TIMING MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED/SPOILED.**
2. Until the 3rd Bell is rung at 02.40 p.m.:
   - Do not remove the seal / 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.

SEAL

INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 60 questions and each question will have four different options / choices.
2. After the 3rd Bell is rung at 02.40 p.m., remove the seal / staple present on the right hand side of this question booklet and start answering on the OMR answer sheet.
3. During the subsequent 70 minutes:
   - Read each question carefully.
   - Choose 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 BALL POINT PEN against the question number on the OMR answer sheet.**

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

4. Please note that 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 on the OMR answer sheet.
5. 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.
6. After the last bell is rung at 03.50 p.m., stop writing on the OMR answer sheet and affix your LEFT HAND THUMB IMPRESSION on the OMR answer sheet as per the instructions.
7. Hand over the OMR ANSWER SHEET to the room invigilator as it is.
8. After separating and retaining the top sheet (KEA Copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of One year.

C

1. The ore that is concentrated by Froth Floatation process is

(1) Bauxite (2) Malachite

(3) Zincite (4) Cinnabar

2. The correct set of four Quantum numbers for outermost electron of Potassium (Z = 19) is

(1) $4, 0, 0, \frac{1}{2}$ (2) $3, 0, 0, \frac{1}{2}$

(3) $4, 1, 0, \frac{1}{2}$ (4) $3, 1, 0, \frac{1}{2}$

3. A body of mass x kg is moving with a velocity of 100 ms^{-1}. Its de Broglie wavelength is 6.62×10^{-35}m. Hence x is ($h = 6.62 \times 10^{-34}$ Js)

(1) 0.15 kg (2) 0.2 kg

(3) 0.1 kg (4) 0.25 kg

4. The correct order of ionisation energy of C, N, O, F is

(1) C < N < O < F (2) C < O < N < F

(3) F < O < N < C (4) F < N < C < O

5. The oxide of an element whose electronic configuration is $1s^2\ 2s^2\ 2p^6\ 3s^1$ is

(1) Basic (2) Acidic

(3) Neutral (4) Amphoteric

Space For Rough Work

6. The characteristic not related to alkali metal is

(1) low melting point

(2) low electronegativity

(3) high ionisation energy

(4) their ions are isoelectronic with noble gases

7. Among the following, the compound that contains ionic, covalent and coordinate linkage is

(1) $NaCl$ (2) CaO

(3) NH_3 (4) NH_4Cl

8. A covalent molecule AB_3 has pyramidal structure. The number of lone pair and bond pair electrons in the molecule are respectively

(1) 3 and 1 (2) 1 and 3

(3) 2 and 2 (4) 0 and 4

9. Excess of carbon dioxide is passed through 50 ml of 0.5 M calcium hydroxide solution. After the completion of the reaction, the solution was evaporated to dryness. The solid calcium carbonate was completely neutralised with 0.1 N Hydrochloric acid. The volume of Hydrochloric acid required is (At. mass of calcium = 40)

(1) 500 cm^3 (2) 400 cm^3

(3) 300 cm^3 (4) 200 cm^3

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10. A bivalent metal has an equivalent mass of 32. The molecular mass of the metal nitrate is

(1) 192 (2) 188

(3) 182 (4) 168

11. The r.m.s. velocity of molecules of a gas of density 4 kg m^{-3} and pressure 1.2×10^5 Nm^{-2} is

(1) 120 ms^{-1} (2) 600 ms^{-1}

(3) 300 ms^{-1} (4) 900 ms^{-1}

12. 0.5 mole of each of H_2, SO_2 and CH_4 are kept in a container. A hole was made in the container. After 3 hours, the order of partial pressures in the container will be

(1) $pH_2 > pSO_2 > pCH_4$ (2) $pH_2 > pCH_4 > pSO_2$

(3) $pSO_2 > pH_2 > pCH_4$ (4) $pSO_2 > pCH_4 > pH_2$

13. The enthalpy of formation of NH_3 is – 46 kJ mol^{-1}. The enthalpy change for the reaction :

$2NH_3(g) \longrightarrow N_2(g) + 3H_2(g)$ is

(1) +92 kJ (2) +46 kJ

(3) +184 kJ (4) +23 kJ

14. 5 moles of SO_2 and 5 moles of O_2 are allowed to react. At equilibrium, it was found that 60% of SO_2 is used up. If the partial pressure of the equilibrium mixture is one atmosphere, the partial pressure of O_2 is

(1) 0.21 atm (2) 0.41 atm

(3) 0.82 atm (4) 0.52 atm

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15. $2HI(g) \rightleftharpoons H_2(g) + I_2(g)$

The equilibrium constant of the above reaction is 6.4 at 300 K. If 0.25 mole each of H_2 and I_2 are added to the system, the equilibrium constant will be

(1) 3.2 (2) 1.6

(3) 6.4 (4) 0.8

16. Rate of physical adsorption increases with

(1) decrease in pressure (2) increase in temperature

(3) decrease in surface area (4) decrease in temperature

17. IUPAC name of $(CH_3)_3CCl$

(1) 2 chloro 2 methyl propane (2) t-butyl chloride

(3) n-butyl chloride (4) 3-chloro butane

18. Lucas test is associated with

(1) Carboxylic acid (2) Alcohols

(3) Aldehydes (4) Phenols

19. An organic compound on heating with CuO produces CO_2 but no water. The organic compound may be

(1) Methane (2) Ethyl iodide

(3) Carbon tetrachloride (4) Chloroform

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20. The condensation polymer among the following is

(1) PVC (2) Polyethene

(3) Rubber (4) Protein

21. The order of stability of metal oxides is

(1) $Fe_2O_3 < Cr_2O_3 < Al_2O_3 < MgO$

(2) $Fe_2O_3 < Al_2O_3 < Cr_2O_3 < MgO$

(3) $Al_2O_3 < MgO < Fe_2O_3 < Cr_2O_3$

(4) $Cr_2O_3 < MgO < Al_2O_3 < Fe_2O_3$

22. The temperature of the slag zone in the metallurgy of Iron using blast furnace is

(1) 400 – 700 °C

(2) 800 – 1000 °C

(3) 1200 – 1500 °C

(4) 1500 – 1600 °C

23. The function of $Fe(OH)_3$ in the contact process is

(1) to remove moisture

(2) to remove dust particles

(3) to remove arsenic impurity

(4) to detect colloidal impurity

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24. In which of the following, NH_3 is not used ?

(1) Group reagent for the analysis of IV group basic radical.

(2) Group reagent for the analysis of III group basic radical.

(3) Tollen's reagent

(4) Nessler's reagent

25. Argon is used

(1) in high temperature welding

(2) in radiotherapy for treatment of cancer

(3) in filling airships

(4) to obtain low temperature

26. The incorrect statement in respect of Chromyl chloride test is

(1) formation of Chromyl chloride

(2) liberation of Chlorine

(3) formation of red vapours

(4) formation of lead chromate

27. The magnetic moment of a transition metal ion is $\sqrt{15}$ B.M. Therefore the number of unpaired electrons present in it is

(1) 1 (2) 2

(3) 3 (4) 4

Space For Rough Work

28. The IUPAC name of $[Co(NH_3)_5\ ONO]^{2+}$ ion is

(1) Penta ammine nitro cobalt (III) ion

(2) Penta ammine nitro cobalt (IV) ion

(3) Penta ammine nitrito cobalt (IV) ion

(4) Penta ammine nitrito cobalt (III) ion

29. The oxidation state of Fe in the brown ring complex : $[Fe(H_2O)_5\ NO]SO_4$ is

(1) +2 (2) +1

(3) +3 (4) 0

30. The correct statement with regard to H_2^+ and H_2^- is

(1) H_2^- is more stable than H_2^+

(2) H_2^+ is more stable than H_2^-

(3) Both H_2^+ and H_2^- are equally stable

(4) Both H_2^+ and H_2^- do not exist

31. Arrange the following in the increasing order of their bond order :

O_2, O_2^+, O_2^- and O_2^{--}

(1) $O_2^+, O_2, O_2^-, O_2^{--}$ (2) $O_2, O_2^+, O_2^-, O_2^{--}$

(3) $O_2^{--}, O_2^-, O_2, O_2^+$ (4) $O_2^{--}, O_2^-, O_2^+, O_2$

Space For Rough Work

32. 2 gm of a radioactive sample having half life of 15 days was synthesised on 1st Jan 2009. The amount of the sample left behind on 1st March, 2009 (including both the days)

(1) 1 gm (2) 0.5 gm

(3) 0 gm (4) 0.125 gm

33. For a chemical reaction A → B, the rate of the reaction is 2×10^{-3} mol dm^{-3} s^{-1}, when the initial concentration is 0.05 mol dm^{-3}. The rate of the same reaction is 1.6×10^{-2} mol dm^{-3} s^{-1} when the initial concentration is 0.1 mol dm^{-3}. The order of the reaction is

(1) 3 (2) 1

(3) 2 (4) 0

34. For the decomposition of a compound AB at 600 K, the following data were obtained :

[AB] mol dm^{-3}	Rate of decomposition of AB in mol $dm^{-3}s^{-1}$
0.20	2.75×10^{-8}
0.40	11.0×10^{-8}
0.60	24.75×10^{-8}

The order for the decomposition of AB is

(1) 1 (2) 2

(3) 1.5 (4) 0

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35. The rate equation for a reaction : $A \rightarrow B$ is $r = K[A]^{\circ}$. If the initial concentration of the reactant is a mol dm^{-3}, the half life period of the reaction is

(1) $\frac{a}{K}$ (2) $\frac{2a}{K}$

(3) $\frac{a}{2K}$ (4) $\frac{K}{a}$

36. 30 cc of $\frac{M}{3}$ HCl, 20 cc of $\frac{M}{2}$ HNO_3 and 40 cc of $\frac{M}{4}$ NaOH solutions are mixed and the volume was made up to 1 dm^3. The pH of the resulting solution is

(1) 1 (2) 3

(3) 8 (4) 2

37. An aqueous solution containing 6.5 gm of NaCl of 90% purity was subjected to electrolysis. After the complete electrolysis, the solution was evaporated to get solid NaOH. The volume of 1 M acetic acid required to neutralise NaOH obtained above is

(1) 100 cm^3 (2) 200 cm^3

(3) 1000 cm^3 (4) 2000 cm^3

38. The standard electrode potential for the half cell reactions are :

$Zn^{++} + 2e^- \longrightarrow Zn \quad E^{\circ} = -0.76$ V

$Fe^{++} + 2e^- \longrightarrow Fe \quad E^{\circ} = -0.44$ V

The E.M.F. of the cell reaction :

$Fe^{++} + Zn \longrightarrow Zn^{++} + Fe$ is

(1) +1.20 V (2) +0.32 V

(3) −0.32 V (4) −1.20 V

Space For Rough Work

39. 10^{-6} M NaOH is diluted 100 times. The pH of the diluted base is

(1) between 6 and 7 (2) between 10 and 11

(3) between 7 and 8 (4) between 5 and 6

40. In the electrolysis of acidulated water, it is desired to obtain 1.12 cc of Hydrogen per second under S.T.P. condition. The current to be passed is

(1) 19.3 Amp (2) 0.965 Amp

(3) 1.93 Amp (4) 9.65 Amp

41. The one which decreases with dilution is

(1) Specific conductance (2) Equivalent conductance

(3) Molar conductance (4) Conductance

42. Vapour pressure of pure 'A' is 70 mm of Hg at 25 °C. It forms an ideal solution with 'B' in which mole fraction of A is 0.8. If the vapour pressure of the solution is 84 mm of Hg at 25 °C, the vapour pressure of pure 'B' at 25 °C is

(1) 70 mm (2) 140 mm

(3) 28 mm (4) 56 mm

43. A 6% solution of urea is isotonic with

(1) 6% solution of Glucose (2) 25% solution of Glucose

(3) 1 M solution of Glucose (4) 0.05 M solution of Glucose

Space For Rough Work

44. In countries nearer to polar region, the roads are sprinkled with $CaCl_2$. This is

(1) to minimise pollution

(2) to minimise the accumulation of dust on the road

(3) to minimise the wear and tear of the roads

(4) to minimise the snow fall.

45. For the reaction $H_2O\ (l) \rightleftharpoons H_2O(g)$ at 373 K and one atmospheric pressure

(1) $\Delta H = T\Delta S$ (2) $\Delta H = \Delta E$

(3) $\Delta H = 0$ (4) $\Delta E = 0$

46. A compound of 'A' and 'B' crystallises in a cubic lattice in which the 'A' atoms occupy the lattice points at the corners of the cube. The 'B' atoms occupy the centre of each face of the cube. The probable empirical formula of the compound is

(1) AB (2) AB_3

(3) AB_2 (4) A_3B

47. In electrophillic aromatic substitution reaction, the nitro group is meta directing because it

(1) increases electron density at meta position

(2) increases electron density at ortho and para positions

(3) decreases electron density at ortho and para positions

(4) decreases electron density at meta position

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48. $CH_3COOH \xrightarrow{LiAlH_4} X \xrightarrow[300\,^\circ C]{Cu} Y \xrightarrow[NaOH]{dilute} Z$

In the above reaction Z is

(1) Ketol (2) Acetal

(3) Butanol (4) Aldol

49. The best method for the conversion of an alcohol into an alkyl chloride is by treating the alcohol with

(1) $SOCl_2$ in presence of pyridine

(2) Dry HCl in the presence of anhydrous $ZnCl_2$

(3) PCl_3

(4) PCl_5

50. The electrophile involved in the sulphonation of Benzene is

(1) H_3^+O (2) SO_3

(3) $S\overset{+}{O}_3$ (4) SO_3^{--}

51. The carbon-carbon bond length in Benzene is

(1) in between C_2H_6 and C_2H_2 (2) in between C_2H_4 and C_2H_2

(3) in between C_2H_6 and C_2H_4 (4) same as in C_2H_4

52. The compound which is not formed during the dry distillation of a mixture of calcium formate and calcium acetate is

(1) Propanone (2) Ethanal

(3) Methanal (4) Propanal

Space For Rough Work

53. An organic compound X is oxidised by using acidified $K_2Cr_2O_7$. The product obtained reacts with Phenyl hydrazine but does not answer silver mirror test. The possible structure of X is

(1) $(CH_3)_2CHOH$ (2) CH_3CHO

(3) CH_3CH_2OH (4) $CH_3-\underset{\underset{O}{\|}}{C}-CH_3$

54. The reaction involved in the oil of Winter Green test is Salicylic acid $\xrightarrow[\text{Conc. } H_2SO_4]{\Delta}$ product. The product is treated with Na_2CO_3 solution. The missing reagent in the above reaction is

(1) Ethanol (2) Methanol

(3) Phenol (4) NaOH

55. The compound which forms acetaldehyde when heated with dilute NaOH is

(1) 1 Chloro ethane (2) 1, 2 Dichloro ethane

(3) 1, 1 Dichloro ethane (4) 1, 1, 1 Trichloro ethane

56. Arrange the following in the increasing order of their basic strengths :

CH_3NH_2, $(CH_3)_2NH$, $(CH_3)_3N$, NH_3

(1) $(CH_3)_3N < NH_3 < CH_3NH_2 < (CH_3)_2NH$

(2) $CH_3NH_2 < (CH_3)_2NH < (CH_3)_3N < NH_3$

(3) $NH_3 < (CH_3)_3N < (CH_3)_2NH < CH_3NH_2$

(4) $NH_3 < (CH_3)_3N < CH_3NH_2 < (CH_3)_2NH$

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57. The one which has least Iodine value is

(1) Ghee (2) Groundnut oil

(3) Sunflower oil (4) Ginger oil

58. A diabetic person carries a pocket of Glucose with him always, because

(1) Glucose reduces the blood sugar level.

(2) Glucose increases the blood sugar level almost instantaneously.

(3) Glucose reduces the blood sugar level slowly.

(4) Glucose increases the blood sugar level slowly.

59. There are 20 naturally occurring amino acids. The maximum number of tripeptides that can be obtained is

(1) 7465 (2) 5360

(3) 8000 (4) 6470

60. Cooking is fast in a pressure cooker, because

(1) food is cooked at constant volume.

(2) loss of heat due to radiation is minimum.

(3) food particles are effectively smashed.

(4) water boils at higher temperature inside the pressure cooker.

Space For Rough Work