COMMON ENTRANCE TEST-2016

DATE	SUBJECT	TIME
DAY-2	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	782417

DOs :

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 2.30 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 AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. The **3rd Bell rings at 2.40 p.m., till then;**
   - Do not remove the paper seal 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

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 60 questions and each question will have one statement and four distracters. (Four different options / choices.)
2. After the **3rd Bell is rung at 2.40 p.m.,** remove the paper seal on the right hand side 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 it replaced by a complete test booklet. Read each item 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 distracters (options / choices) given under each question / statement.
   - **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 answer sheet is as shown below :

(1) (●) (3) (4)

4. Please note that even a minute unintended ink dot on the OMR answer 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. Do not use the OMR answer sheet for the same.
6. After the **last bell is rung at 3.50 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 the top sheet (Our 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

[Turn Over

1. The half-life period of a 1st order reaction is 60 minutes. What percentage will be left over after 240 minutes ?

(1) 6.25% (2) 4.25%

(3) 5% (4) 6%

2. Which of the following is not a colligative property ?

(1) Osmotic pressure (2) Optical activity

(3) Depression in Freezing point (4) Elevation in Boiling point

3. The contribution of particle at the edge centre to a particular unit cell is,

(1) $\frac{1}{2}$ (2) $\frac{1}{4}$

(3) 1 (4) $\frac{1}{8}$

4. When an electrolyte is dissociated in solution, the van't Hoff's factor (i) is,

(1) >1 (2) <1

(3) = 0 (4) = 1

5. Which of the following is incorrect in a galvanic cell ?

(1) Oxidation occurs at anode.

(2) Reduction occurs at cathode.

(3) The electrode at which electrons are gained is called cathode.

(4) The electrode at which electrons are lost is called cathode.

Space For Rough Work

6. A secondary cell is one

(1) can be recharged.

(2) can be recharged by passing current through it in the same direction.

(3) can be recharged by passing current through it in the opposite direction.

(4) can not recharged.

7. Osmotic pressure of the solution can be increased by,

(1) increasing the temperature of the solution.

(2) decreasing the temperature of the solution.

(3) increasing the volume of the vessel.

(4) diluting the solution.

8. The amount of current in Faraday is required for the reduction of 1 mol of $Cr_2O_7^{--}$ ions to Cr^{3+} is,

(1) 1 F (2) 2 F

(3) 6 F (4) 4 F

9. For a chemical reaction,

$mA \rightarrow xB$, the rate law is $r = k[A]^2$.

If the concentration of A is doubled, the reaction rate will be,

(1) Doubled (2) Quadrupled

(3) Increases by 8 times (4) Unchanged

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10. Schottky defect in a crystal is observed when,

(1) Unequal number of cations and anions are missing from the lattice.

(2) Equal number of cations and anions are missing from the lattice.

(3) An ion leaves its normal site and occupies an interstitial site.

(4) No ion is missing from its lattice site

11. $3A \longrightarrow 2B$, rate of reaction $+ \frac{d[B]}{dt}$ is equal to

(1) $-\frac{3}{2}\frac{d[A]}{dt}$

(2) $-\frac{2}{3}\frac{d[A]}{dt}$

(3) $+2\frac{d[A]}{dt}$

(4) $-\frac{1}{3}\frac{d[A]}{dt}$

12. The activation energy of a chemical reaction can be determined by,

(1) evaluating rate constants at two different temperatures.

(2) changing the concentration of reactants.

(3) evaluating the concentration of reactants at two different temperatures.

(4) evaluating rate constant at standard temperature.

13. Which of the following statements is incorrect w.r.t. Physisorption ?

(1) The forces involved are van der Waal's forces.

(2) More easily liquifiable gases are adsorbed easily.

(3) Under high pressure it results into Multi-molecular layer on adsorbent surface.

(4) $\Delta H_{adsorption}$ is low and +Ve.

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14. Sulphur sol contains

(1) Discrete S-atoms

(2) Discrete S-molecules

(3) Large aggregates of S-molecules

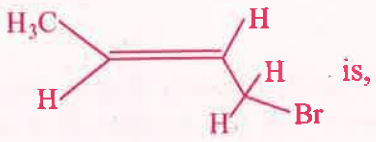
(4) Water dispersed in Solid Sulphur

15. Reactions in Zeolite catalyst depend on,

(1) Pores (2) Apertures

(3) Size of cavity (4) All of these

16. IUPAC name of the compound



is,

(1) 1-Bromo but-2-ene (2) 2-Bromo-2-butene

(3) Bromo butene (4) 1-Bromo but-3-ene

17. Replacement of Cl of Chlorobenzene to give phenol requires drastic conditions, but Cl of 2, 4 – dinitro chlorobenzene is readily replaced. This is because,

(1) $-NO_2$ group makes the ring electron rich at ortho and para positions.

(2) $-NO_2$ group withdraws electrons from meta position.

(3) $-NO_2$ donate electrons at meta position.

(4) $-NO_2$ withdraws electrons from ortho and para positions.

Space For Rough Work

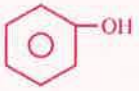
18. In the reaction :

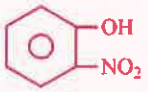
Ethanol $\xrightarrow{PCl_5}$ X $\xrightarrow{\text{alc KOH}}$ Y $\xrightarrow[H_2O,\Delta]{H_2SO_4,\text{ Room temp.}}$ Z, the product Z is,

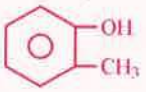
(1) C_2H_4 (2) $CH_3CH_2OCH_2CH_3$

(3) $CH_3CH_2OSO_3H$ (4) 

19. Which of the following compound is most acidic ?

(1) $Cl - CH_2 - CH_2 - OH$ (2) 

(3) 

(4) 

20. Benzene carbaldehyde is reacted with concentrated NaOH solution to give the products A and B. The product A can be used food preservative and the product B is an aromatic hydroxy compound where OH gorup is linked to sp^3 hybridised carbon atom next to Benzene ring. The products A and B are respectively,

(1) Sodium benzoate and phenol

(2) Sodium benzoate and phenyl methanol

(3) Sodium benzoate and cresol

(4) Sodium benzoate and picric acid

21. The reaction which involves dichlorocarbene as an electrophile is,

(1) Reimer-Tiemann reaction (2) Kolbe's reaction

(3) Friedel-Craft's acylation (4) Fittig's reaction.

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22. Ethanol is converted into ethoxy ethane,

(1) by heating excess of ethanol with conc. H_2SO_4 at 140 °C.

(2) by heating Ethanol with excess of conc. H_2SO_4 at 443 K.

(3) by treating with conc. H_2SO_4 at room temperature.

(4) by treating with conc. H_2SO_4 at 273 K.

23. An organic compound X is oxidised by using acidified $K_2Cr_2O_7$ solution. The product obtained reacts with phenyl hydrazine but does not answer silver mirror test. The compound X is,

(1) 2–propanol (2) Ethanal

(3) Ethanol (4) $CH_3CH_2CH_3$

24. Predict the product 'C' in the following series of reactions :

$$CH_3 - COOH \xrightarrow{PCl_5} A \xrightarrow[\text{Anhyd } AlCl_3]{C_6H_6} B \xrightarrow{CH_3MgBr} C$$

(1)  (2) $CH_3CH(OH)C_6H_5$

(3) $CH_3CH(OH)C_2H_5$ (4) $(CH_3)_2C(OH)C_6H_5$

25. The number of oxygen atoms in 4.4 gm of CO_2 is,

(1) 1.2×10^{23} (2) 6×10^{22}

(3) 6×10^{23} (4) 12×10^{23}

Space For Rough Work

26. If the bond energies of H–H, Br–Br and H–Br are 433, 192 and 364 kJ mol^{-1} respectively, then $\Delta H°$ for the reaction :

$H_{2(g)} + Br_{2(g)} \rightarrow 2HBr_{(g)}$ is

(1) –261 kJ (2) +103 kJ

(3) +261 kJ (4) – 103 kJ

27. In the reaction; $Fe(OH)_{3(s)} \rightleftharpoons Fe^{3+}_{(aq)} + 3OH^{-}_{(aq)}$, if the concentration of OH^- ions is decreased by $\frac{1}{4}$ times, then the equilibrium concentration of Fe^{3+} will increase by,

(1) 8 times (2) 16 times

(3) 64 times (4) 4 times

28. The correct statement regarding entropy is,

(1) At absolute zero temperature, entropy of a perfectly crystalline solid is zero.

(2) At absolute zero temperature, the entropy of a perfectly crystalline substance is +Ve.

(3) At absolute zero temperature, the entropy of all crystalline substances is zero.

(4) At 0 °C, the entropy of a perfect crystalline solid is zero.

29. Equilibrium constants K_1 and K_2 for the following equilibria

(a) $NO_{(g)} + \frac{1}{2}O_{2(g)} \rightleftharpoons NO_{2(g)}$

(b) $2NO_{2(g)} \rightleftharpoons 2NO_{(g)} + O_{2(g)}$

are related as :

(1) $K_1 = \sqrt{K_2}$ (2) $K_2 = \frac{1}{K_1}$

(3) $K_1 = 2K_2$ (4) $K_2 = \frac{1}{K_1^2}$

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30. Van-Arkel method of refining Zirconium involves,

(1) removing all oxygen and nitrogen impurities.

(2) removing CO impurity

(3) removing Hydrogen impurity

(4) removing silica impurity

31. The composition of 'copper matte' is,

(1) $Cu_2S + FeS$ (2) $Cu_2S + Cu_2O$

(3) $Cu_2S + FeO$ (4) $Cu_2O + FeS$

32. The complex formed when Al_2O_3 is leached from Bauxite using concentrated NaOH solution is,

(1) $Na[Al(OH)_4]$ (2) $NaAl_2O_4$

(3) $Na_2[Al(OH)_3]$ (4) Na_2AlO_2

33. The property which is **not** true about Fluorine is,

(1) Most of its reactions are exothermic.

(2) It forms only one oxo acid.

(3) Highest electronegativity.

(4) High F-F bond dissociation enthalpy.

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34. Which is true regarding nitrogen ?

(1) Less electronegative
(2) Has low ionisation enthalpy
(3) d-orbitals are available
(4) Ability to form $p\pi - p\pi$ bonds with itself

35. The shape of XeF_6 is,

(1) Square planar
(2) Distorted octahedral
(3) Square pyrimidal
(4) Pyramidal

36. The number of isomers possible for the octahedral complex $[CoCl_2(en)(NH_3)_2]^+$ is,

(1) Two
(2) Three
(3) No isomer
(4) Four isomers

37. CO is a stronger ligand than Cl^-, because

(1) CO is a neutral molecule.
(2) CO has π-bonds.
(3) CO is poisonous.
(4) CO is more reactive.

38. The bivalent metal ion having maximum paramagnetic behaviour among the first transition series elements is,

(1) Mn^{2+}
(2) Cu^{2+}
(3) Sc^{2+}
(4) Cu^{+}

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39. When a brown compound of Mn (A) is treated with HCl, it gives a gas (B). The gas (B) taken in excess reacts with NH_3 to give an explosive compound (C).

The compounds A, B and C are;

(1) $A = MnO_2$, $B = Cl_2$, $C = NCl_3$

(2) $A = MnO$, $B = Cl_2$, $C = NH_4Cl$

(3) $A = Mn_3O_4$, $B = Cl_2$, $C = NCl_3$

(4) $A = MnO_3$, $B = Cl_2$, $C = NCl_2$

40. Mn^{2+} compounds are more stable than Fe^{2+} compounds towards oxidation to their +3 state, because

(1) Mn^{2+} is more stable with high 3rd Ionisation energy.

(2) Mn^{2+} is bigger in size.

(3) Mn^{2+} has completely filled d-orbitals.

(4) Mn^{2+} does not exist.

41. Which of the following sequence is correct regarding field strength of ligands as per spectrochemical series ?

(1) $SCN^- < F^- < CN^- < CO$ (2) $F^- < SCN^- < CN^- < CO$

(3) $CN^- < F^- < CO < SCN^-$ (4) $SCN^- < CO < F^- < CN^-$

42. As per IUPAC norms, the name of the complex $[Co(en)_2(ONO)Cl]Cl$ is

(1) Chlorido bis(ethane-1, 2 – diamine) nitro-o-cobalt (III) chloride.

(2) Chloro bis(ethylene diamine) nitro-o-cobalt (III) chloride.

(3) Chlorido di(ethylene diamine) nitro cobalt (III) chloride.

(4) Chloro ethylene diamine nitro-o-cobalt (III) chloride.

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43. In the following sequence of reactions ;

$$A \xrightarrow{\text{Reduction}} B \xrightarrow{HNO_2} CH_3CH_2OH$$

The compound A is

(1) Propane nitrile (2) Ethane nitrile

(3) CH_3NO_2 (4) CH_3NC

44. An organic compound A on reduction gives compound B, which on reaction with trichloro methane and caustic potash forms C. The compound 'C' on catalytic reduction gives N–methyl benzenamine, the compound 'A' is,

(1) Nitrobenzene (2) Nitromethane

(3) Methanamine (4) Benzenamine

45. Which of the following gives positive Fehling's solution test ?

(1) Sucrose (2) Glucose

(3) Fats (4) Protein

46. A liquid can exist only,

(1) Between triple point and critical point.

(2) At any temperature above melting point.

(3) Between melting point and critical point.

(4) Between boiling and melting points.

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47. The energy of electron in the n^{th} Bohr orbit of H-atom is

(1) $\frac{-13.6}{n^2}$eV (2) $\frac{-13.6}{n}$eV

(3) $\frac{-13.6}{n^4}$eV (4) $\frac{-13.6}{n^3}$eV

48. Consider the following sets of quantum numbers :

Which of the below setting is not permissible arrangement of electrons in an atom ?

	n	l	m	s
(1)	4	0	0	$-\frac{1}{2}$
(2)	5	3	0	$+\frac{1}{2}$
(3)	3	2	–2	$-\frac{1}{2}$
(4)	3	2	–3	$+\frac{1}{2}$

49. The increasing order of bond order of O_2, O_2^+, O_2^- and O_2^{--} is

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

50. HC*l* gas is covalent and NaC*l* is an ionic compound. This is because

(1) Sodium is highly electro +Ve.

(2) Hydrogen is a non-metal.

(3) HC*l* is a gas.

(4) Electronegativity difference between H and C*l* is less than 2.1.

Space For Rough Work

51. Which of the following is not true ?

(1) In vulcanisation the rubber becomes harder and stronger.

(2) Natural rubber has 'trans' configuration at every double bond.

(3) Buna-S is a co-polymer of Butene and styrene.

(4) Natural rubber is 1, 4-polymer of isoprene.

52. Which of the following is a polyamide ?

(1) Nylon-6, 6 (2) Terylene

(3) Polythene (4) Buna-S

53. Which of the following is correct about H-bonding in DNA ?

(1) A – T, G – C (2) A – G, T – C

(3) G – T, A – C (4) A – A, T – T

54. Which of the following is employed as Tranquilizer ?

(1) Equanil (2) Naproxen

(3) Tetracyclin (4) Dettol

55. Reactivity of order of halides for dehydrohalogenation is

(1) R – F > R – Cl > R – Br > R – I

(2) R – I > R – Br > R – Cl > R – F

(3) R – I > R – Cl > R – Br > R – F

(4) R – F > R – I > R – Br > R – Cl

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56. Main axis of diatomic molecule is Z. The orbitals P_x and P_y overlap to form

(1) π - molecular orbital (2) σ - molecular orbital

(3) δ - molecular orbital (4) No bond is formed.

57. The hybridisation of C in diamond, graphite and ethyne is in the order

(1) sp^3, sp, sp^2 (2) sp^3, sp^2, sp

(3) sp, sp^2, sp^3 (4) sp^2, sp^3, sp

58. A miscible mixture of C_6H_6 + $CHCl_3$ can be separated by

(1) Sublimation (2) Distillation

(3) Filtration (4) Crystallisation

59. An organic compound contains C = 40%, H = 13.33% and N = 46.67%. Its emperical formula is

(1) C_2H_2N (2) C_3H_7N

(3) CH_4N (4) CHN

60. Electrophile that participates in nitration of benzene is

(1) NO^+ (2) NO_2^+

(3) NO (4) NO_3^-

Space For Rough Work

A-1