CET-2015

Sr. No. : 124353

Booklet Series Code : A

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

Roll No. *In Figures* *In Words*

O.M.R. Answer Sheet Serial No.

Signature of the Candidate :

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 Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Subject and Series Code of Question Booklet 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. To open the Question Booklet remove the staple(s) gently when asked to do so.
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 answers (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 Sheet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
9. Negative marking will be adopted for evaluation i.e., 1/4th 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 sheets marked "Rough Work" 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. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance 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.
16. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculators is not allowed.**

1. **At high pressure, van der waals equation becomes :**

(A) $PV = RT$ (B) $PV = RT + a/V$

(C) $PV = RT - a/V$ (D) $PV = RT + Pb$

2. **Match the following**

(X) Inversion Temperature (i) a/Rb

(Y) Boyle's Temperature (ii) 8a/27Rb

(Z) Critical Temperature (iii) 2a/Rb

(A) X–i, Y–ii, Z-iii (B) X–iii, Y–ii, Z-i

(C) X–iii, Y–i, Z-ii (D) X–i, Y–iii, Z-ii

3. **For an adiabatic process, which of the following relations is correct ?**

(A) $\Delta E = 0$ (B) $P\Delta V = 0$

(C) $q = 0$ (D) $q = +w$

4. **The work done in ergs for a reversible expansion of one mole of an ideal gas from a volume of 10 litre to 20 litre at 25°C is :**

(A) $2.303 \times 8.31 \times 10^7 \times 298\log 2$ (B) $2.303 \times 0.0821 \times 298\log 2$

(C) $2.303 \times 0.0821 \times 298\log 0.5$ (D) $2.303 \times 2 \times 298\log 2$

5. **The equilibrium constant for the reaction $SO_2(g) + \frac{1}{2} O_2(g) \rightleftharpoons SO_3(g)$ is 5×10^{-2} atm$^{-½}$. The equilibrium constant for the reaction : $2 SO_3(g) \rightleftharpoons 2SO_2(g) + O_2(g)$ would be :**

(A) 100 atm (B) 200 atm

(C) 4×10^2 atm (D) 6.25×10^4 atm

6. **In gaseous reversible reaction : $N_2(g) + O_2(g) \rightleftharpoons 2NO(g) +$ heat, pressure is increased then the equilibrium constant would be :**

(A) Unchanged

(B) Increased

(C) Decreased

(D) First increase then decrease

7. **Two moles of PCl_5 are heated in a closed vessel of 2 litre capacity. When the equilibrium is attained 40% of it has been found to be dissociated. What is the value of K_c in mol/dm^3 ?**

(A) 0.532

(B) 0.266

(C) 0.133

(D) 0.174

8. **The standard emf of a galvanic cell involving cell reaction with n = 2 is found to be 0.295V at 25°C. The equilibrium constant for the reaction would be (Given : F = 96500 Cmol^{-1} ; R = 8.314 JK^{-1} mol^{-1}) :**

(A) 2×10^{11}

(B) 4×10^{12}

(C) 1×10^{2}

(D) 1×10^{10}

9. **The solubility of a gas in liquid increases with :**

(A) Increase in temperature

(B) Reduction of gas pressure

(C) Decrease in temperature and Increase of gas pressure

(D) Amount of liquid taken

10. **If 0.1 M solution of glucose and 0.1 M urea solution are placed on two sides of a semipermeable membrane to equal heights then it will be correct to say that :**

(A) There will be no net movement across the membrane

(B) Glucose will flow towards urea solution

(C) Urea will flow towards glucose solution

(D) Water will flow from urea solution towards glucose solution

11. **The specific conductance of a 0.01 M solution of KCL is 0.0014 ohm^{-1} cm^{-1} at 25°C. Its equivalent conductance is :**

(A) 14 (B) 140

(C) 1.4 (D) 0.14P

12. **The oxidation potentials of Zn, Cu, Ag, H_2 and Ni are 0.76, –0.34, –0.80, 0 and 0.25 volt respectively. Which of the following reactions will provide maximum voltage ?**

(A) $Zn + Cu^{2+} \rightarrow Cu + Zn^{2+}$ (B) $Zn + 2Ag^{+} \rightarrow 2Ag + Zn^{2+}$

(C) $H_2 + Cu^{2+} \rightarrow 2H^{+} + Cu$ (D) $H_2 + Ni^{2+} \rightarrow 2H^{+} + Ni$

13. **The rate of Chemisorptions :**

(A) Decreases with increase of pressure (B) Is independent of p ressure

(C) Is maximum at one atmospheric pressure (D) Increases with increase of pressure

14. **The migration of colloidal particles under the influence of an electric field is known as :**

(A) Electro-osmosis (B) Brownian movement

(C) Cataphoresis (D) Dialysis

15. **The Crystalline structure of NaCl is :**

(A) Hexagonal close packed (B) Face centered cubic

(C) Square planar (D) Body–centered cubic

16. **The unit cell of Al (molar mass 27 g/mol^{-1}) has an edge length of 405 pm. Its density is 2.7 g/cm^3. The cubic unit cell is :**

(A) Face-centered (B) Body–centered

(C) Edge–centered (D) Simple

17. **A graph between time (t) and substance consumed at any time t is found to be a straight line passing through origin. This indicates that the reaction is of :**

(A) Second order
(B) First order
(C) Zero order
(D) Fractional order

18. **The reaction, X $\rightarrow$ Y (product) follows first order kinetics. In 40 minutes, the concentration of X changes from 0.1 M to 0.025 M, then the rate of reaction when concentration of X is 0.01 M is :**

(A) 1.73×10^{-4} M/min^{-1}
(B) 3.47×10^{-5} M/min^{-1}
(C) 3.47×10^{-4} M/min^{-1}
(D) 1.73×10^{-5} M/min^{-1}

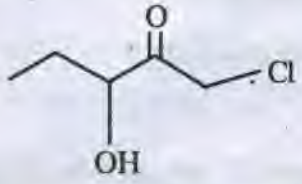
19. **Colligative properties are applicable to :**

(A) Ideal dilute solutions
(B) Concentrated solutions
(C) Non–ideal solutions
(D) All of these

20. **Which defect causes decrease in the density of a crystal ?**

(A) Frenkel defect
(B) Schottky defect
(C) Interstitial defect
(D) F-centre

21. **IUPAC name for the compound given below is :**



(A) 3–Hydroxy–5–Chloro–4–Pentanone
(B) 1–Chloro–3–Hydroxy–2–Pentanone
(C) 1–Chloro–3–Ethyl–3–Hydroxy–2–Propanone
(D) 1–Chloro–2–Oxo–3–Hydroxypentane

22. **The most stable carbocation in the following list is :**

$CH_3CH_2^+$, $C_6H_5CH_2^+$, $(CH_3)_2CH^+$, $(C_6H_5)C^+$

(A) $(C_6H_5)_3C^+$
(B) $C_6H_5CH_2^+$
(C) $(CH_3)_2CH^+$
(D) $CH_3CH_2^+$

23. **The thermal decomposition of higher hydrocarbons into lower hydrocarbons is termed as :**

(A) Reforming
(B) Sublimation
(C) Isomerisation
(D) Cracking

24. **Ozonolysis of 2–methylpropene followed by reduction with Zn/CH_3COOH gives :**

(A) Propionaldehyde and formaldehyde
(B) Acetaldehyde and acetone
(C) Acetone and formaldehyde
(D) Acetaldehyde and water

25. **Acetylenic hydrogen's of alkynes can also be replaced with heavy metal Ag^+ by using :**

(A) Fehling's reagent
(B) Tollen's reagent
(C) Hinsberg's reagent
(D) Fenton's reagent

26. **Treatment of nitrobenzene with fuming HNO_3 in the presence of H_2SO_4 at 373 K affords :**

(A) *m*– Dinitrobenzene
(B) *p*– Dinitrobenzene
(C) *o*– Dinitrobenzene
(D) Benzene

27. **Presence of Chlorofluorocarbons in atmosphere leads to :**

(A) Global warming
(B) Greenhouse effect
(C) Smog
(D) Depletion of ozone layer

28. **Which of the following gases leads to acid rain ?**

(A) CO & NO
(B) SO_2 & NO_2
(C) CO_2 & SO_2
(D) CO & NO_2

29. **When ethylbromide is treated with sodium acetylide the product formed is :**

(A) 1–Butyne
(B) 2–Butene
(C) 1–Butene
(D) 2–Butyne

30. **Freon is used as :**

(A) Agricultural pesticide
(B) Fire extinguisher
(C) Refrigerant and propellant
(D) Dry cleaning agent

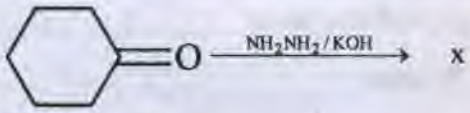
31. **Reaction of Phenol with acetic anhydride in the presence of pyridine gives :**

(A) Phenyl propionate
(B) Phenyl benzoate
(C) Salicylic acid
(D) Phenyl acetate

32. **The products formed when $C_2H_5OC_2H_5$ reacts with conc. HI(cold) :**

(A) Ethyl iodide and water
(B) Ethyl alcohol and ethyl iodide
(C) Ethyl alcohol and water
(D) Ethyl iodide only

33. **Predict the final product X in the following reaction :**



(A) Cyclohexane
(B) Cyclohexene
(C) Cyclohydrazone
(D) Benzene

34. **The conversion of propionic acid to α–bromopropionic acid can be achieved with the help o following reagent :**

(A) Br_2/aq KOH
(B) Br_2/CCl_4
(C) Br_2/P
(D) PBr_3

35. **When ethylamine is warmed with chloroform and alcoholic potash, Y compound is formed whic gives very offensive smell. The compound Y is :**

(A) Ethyl isocyanate
(B) Naphthalene
(C) Ethyl cyanide
(D) Ehtyl isocyanide

36. **Benzene diazonium salt can be prepared by reaction of :**

(A) Aliphatic amine with nitrous acid
(B) Aliphatic amine with nitric acid
(C) Aromatic amine with nitrous acid
(D) Aromatic amine with nitric acid

37. **The structure of silk fibroin protein corresponds to :**

(A) α–Helix
(B) β–Pleated Sheet
(C) γ–Coiled
(D) δ–Planner

38. **Deficiency of Vitamin D leads to :**

(A) Rickets and osteomalacia
(B) Night–blindness
(C) Scurvy
(D) Sterility

39. **Which of the following is not an example of condensation polymer ?**

(A) Nylon–66
(B) Terylene
(C) Buna–S
(D) Bakelite

40. **The colloidal solution of soaps in water removes the greasy matter by :**

(A) Adsorption
(B) Coagulation
(C) Absorption
(D) Emulsification

41. **The highest excited state that unexcited hydrogen atoms can reach when they are bombarded with 12.2 eV electron is :**

(A) $n = 1$
(B) $n = 2$
(C) $n = 3$
(D) $n = 4$

42. **The bond length in O_2^+, O_2, O_2^- and O_2^{2-} follows the order :**

(A) $O_2^{2-} > O_2^- > O_2 > O_2^+$
(B) $O_2^+ > O_2 > O_2^- > O_2^{2-}$
(C) $O_2 > O_2^- > O_2^{2-} > O_2^+$
(D) $O_2^- > O_2^{2-} > O_2^+ > O_2$

43. 4.4g of CO_2 and 2.24 litre of H_2 at STP are mixed in a container. The total number of molecules present in the container will be :

(A) 6.022×10^{23} (B) 1.2044×10^{23}

(C) 2 mole (D) 6.023×10^{24}

44. Equivalent weight of FeC_2O_4 in the change : FeC_2O_4 --------$Fe^{3+} + CO_2$ is :

(A) M/3 (B) M/6

(C) M/2 (D) M/1

45. Poling process is used :

(A) For the removal of Al_2O_3 from Al (B) For the removal of Cu_2O from Cu

(C) For the removal of ZnO from Zn (D) For the removal of Fe_2O_3 from Fe

46. Heavy water is not used for drinking because :

(A) It is poisonous

(B) It is costly

(C) Its physiological action is different from ordinary water

(D) Its chemical properties are different from ordinary water

47. Al_2O_3 formation involves large quantity of heat evolution which makes its use in :

(A) Deoxidiser (B) Confectionery

(C) Indoor photography (D) Thermite welding

48. The oxidation state of Mo in its oxo-complex species $[Mo_2O_4(C_2H_4)_2(H_2O)_2]^{2-}$ is :

(A) +2 (B) +3

(C) +4 (D) +5

49. Wrought iron is :

(A) Pure iron with 0.1 to 0.2% C
(B) Pig Iron
(C) An alloy of steel
(D) Impure sulphide ore of iron

50. For which one of the following ions, the colour is not due to a d-d transitions ?

(A) CrO_4^{2-}
(B) $Cu(NH_3)_4^{2+}$
(C) $Ti(H_2O)_6^{3+}$
(D) CoF_6^{3+}

51. Antichor is a compound :

(A) Which absorb chlorine
(B) Which removes Cl_2 from a material
(C) Which liberates Cl_2 from bleaching powder
(D) Which acts as a catalyst in the manufacture of Cl_2

52. H_2S cannot be dried by passing over conc. H_2SO_4 because :

(A) The acid oxidises it
(B) The acid combines with H_2S to form a salt
(C) Both form complex
(D) It dissolves in the acid

53. P_4O_{10} has short and long P-O bonds. The number of short P–O bonds in this compound is :

(A) 1
(B) 2
(C) 3
(D) 4

54. CO_2 and N_2 are non–supporter of combustion. However, for putting out fires CO_2 is preferred over N_2 and CO_2 :

(A) Does not burn
(B) Forms non–combustible products with burning substances
(C) Is denser than nitrogen
(D) Is more reactive.

55. **Addition of excess of sodium hydroxide solution to a solution of nickel sulphate result in the formation of a :**

(A) Green precipitate
(B) Pink colouration
(C) Blue precipitate
(D) Violet colouration

56. **The hydride which does not act as reducing agent is :**

(A) NH_3
(B) CaH_2
(C) NaH
(D) $LiAlH_4$

57. **Newly shaped glass articles when cooled suddenly become brittle, therefore these are cooled slowly, this process is known as :**

(A) Tempering
(B) Annealing
(C) Quenching
(D) Galvanising

58. **Liquid ammonia bottles be opened after cooling them in ice for some time. It is because liquid NH_3 :**

(A) Brings tears to the eyes
(B) Has a high Vapour pressure
(C) Is a corrosive liquid
(D) Is a mild explosive

59. **Starch paper moistened with KI solution turns blue in ozone because of :**

(A) Iodine liberation
(B) Oxygen liberation
(C) Alkali formation
(D) Ozone reacts with litmus paper

60. **The compound which can remove both oxygen and nitrogen of the air when it is passed over it at 1000°C :**

(A) CaC_2
(B) $CaCl_2$
(C) $CaCN_2$
(D) $Ca(CN)_2$

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CET(UG)-2015

FINAL ANSWERS / KEY

Subject: CHEMISTRY

Booklet Series Code: A

1	2	3	4	5	6	7	8	9	10
D	C	C	A	C	A	B	D	C	A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	B	D	C	B	A	C	C	A	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	A	D	C	B	A	D	B	A	C
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	B	A	C	D	C	B	A	C	D
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
C	A	B	A	B	C	D	B	A	A
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
B	A	D	C	A	A	B	B	A	A

Note: An 'X' in the key indicates that either the question is ambiguous or it has printing mistake. All candidates will be given credit for this question.