BLUE PRINT- CHEMISTRY
XI- CLASS (W.T)

General Instructions :

1. All questions are compulsory.
2. Question No. 1-5 are very short answer questions and carry 1 mark each.
3. Question No. 6-10 are short answer questions and carry 2 marks each.
4. Question No. 11-15 are also short answer questions and carry 3 marks each.
5. Question No. 16-19 are long answer questions and carry 5 marks each.
6. Use log tables if necessary, use of calculators is not allowed.

S. NO	Types of Ques	No. Of Ques	Marks for each ques	Total Marks
1	V. short ans type ques	5	1	5
2	Short ans type ques	5	2	10
3	Long ans type ques	5	3	15
5	V. Long ans type Ques	4	5	20

DELHI PUBLIC SCHOOL, BAHADURGARH

CLASS: XI Summative Assessment 1 sample paper

SUBJECT: CHEMISTRY

TIME: 3hours

M.MARKS: 70

GENERAL INSTRUCTIONS:

- All questions are compulsory.
- Question nos. 1 to 8 is very short answer type questions and carries 1mark each.

- Question nos. 9 to 18 is short answer type questions and carries 2marks each.
- Question nos. 19 to 27 are also short answer type questions and carry 3marks each.
- Question nos. 28 to 30 is long answer type questions and carries 5marks each.
- Use log tables if necessary, use of calculators is not allowed.

1. Write the correct symbol for the nucleus with an atomic number 56 and mass number 138.
2. State Law of Definite Proportions.
3. Which element do you think would have been named by Seaborg's group?
4. An atomic orbital has n=3. What are the possible values of l and m_l.
5. Draw the Lewis structure of H_2S.
6. Define electronegativity.
7. State Aufbau principle.
8. Write the resonance structures of NO_3^-.
9. How much copper can be obtained from 200g of copper sulphate?
10. Which of the following species will have the largest and the smallest size: Mg, Mg^{2+}, Al, Al^{3+}?
11. Write resonance structures of (a) CH_3COO^- (b) $C_6H_5NH_2$.
12. Write the structural formula of (a) p – Nitro aniline (b) 2,3 – Dibromo-1-phenylpentane.
13. Write the expanded form of the following condensed formulas into their complete structural formulas.
    (a) $CH_3CH_2COCH_2CH_3$.
    (b) $CH_3CH{=}CH\ (CH_2)_3CH_3$.
14. How many σ and π bonds are present in each of the following molecules?
    (a) $HC{\equiv}CCH{\equiv}CHCH_3$ (b) $CH_2{=}C{=}CHCH_3$.
15. What is the basic difference between metals and non-metals?
16. Explain why BeH_2 molecule has a zero dipole moment although the Be-H bonds are polar.
17. Find energy of each of the photons which
    a) Correspond to light of frequency 3×10^{15} Hz.
    b) Have wavelength of 0.50Å
18. Distinguish between an atomic emission spectrum and an atomic absorption spectrum.
19. What is the wavelength of light emitted when the electron in a hydrogen atom undergoes transition from an energy level with n=5 to an energy level with n=3?
20. Calculate the concentration of nitric acid in moles per litre in a sample which has a density $1.41 gml^{-1}$ and the mass percent of nitric acid in it being 69%.
21. Calcium carbonate reacts with aqueous HCl to give $CaCl_2$ and CO_2 according to the reaction, $CaCO_3 + 2HCl \rightarrow CaCl_2 + CO_2 + H_2O$
    What mass of $CaCO_3$ is required to react completely with 25mL of 0.75M HCl?

22. Describe the hybridization in case of PCl_5. What are the axial bonds longer as compared to equatorial bonds?
23. Explain Inductive effect with an example.
24. Although both CO and H_2O are triatomic molecules, the shape of H_2O molecule is bent while that of CO_2 is linear. Why?
25. What will be the pressure exerted by a mixture of 3.2g of methane and 4.4g of carbon dioxide contained in a $9dm^3$ flask at 27°C?
26. Explain the formation of H_2 on the basis of valence Bond Theory.
27. Define Critical Temperature, Critical Pressure and Critical Volume.
28. Draw the molecular orbital diagram for C_2. Also state its electronic configuration, magnetic properties and bond order.
29. Derive Ideal Gas equation. Calculate the volume occupied by 8.8g of CO_2 at 31.1°C and 1 bar pressure.
30. Write the general outer electronic configuration and characteristics of s-, p- , d- and f-block elements.

DELHI PUBLIC SCHOOL, BAHADURGARH

CLASS: XI

SUBJECT: CHEMISTRY (SET-2)

TIME: 3hours

M.MARKS: 70

GENERAL INSTRUCTIONS:

- All questions are compulsory.
- Question nos. 1 to 8 is very short answer type questions and carries 1mark each.
- Question nos. 9 to 18 is short answer type questions and carries 2marks each.
- Question nos. 19 to 27 are also short answer type questions and carry 3marks Each.
- Question nos. 28 to 30 is long answer type questions and carries 5marks each.
- Use log tables if necessary, use of calculators is not allowed.

1. Write the correct symbol for the nucleus with atomic number 26 and mass number 55.
2. State Law of Multiple Proportions.
3. Which element do you think would have been named by Lawrence Berkeley Laboratory/
4. An atomic orbital has n=4. What are the possible values of l and m_l.
5. Draw the Lewis structure of BeF_2.
6. Define bond length.
7. State Pauli's Exclusion Principle.
8. Write the resonance structures of CO_3^{2-}.
9. How much copper can be obtained from 300g of copper sulphate?
10. Which of the following will have the most negative electron gain enthalpy and which the least negative: P, S, Cl, F? Explain the answer.
11. Write the resonance structures of (a) CH_3NO_2 (b) CH_3COO^-
12. Write the structural formula of (a) p – Nitro aniline (b) 2,3 – Dibromo-1-phenylpentane.
13. Write the expanded form of the following condensed formulas into their complete structural formulas.
    (a) $CH_3CH_2COCH_2CH_3$.
    (b) $CH_3CH{=}CH\ (CH_2)_3CH_3$.
14. How many σ and π bonds are present in each of the following molecules?
    (a) $HC{\equiv}CCH{\equiv}CHCH_3$ (b) $CH_2{=}C{=}CHCH_3$.
15. What is the basic difference between electron gain enthalpy and electronegativity?
16. Explain why NH_3 ha higher dipole moment that NF_3?
17. Yellow light emitted from a sodium lamp has a wavelength of 580 nm. Calculate the frequency and wave number of the yellow light.

18. Distinguish between an line emission spectrum and an line absorption spectrum.
19. What is the wavelength of light emitted when the electron in a hydrogen atom undergoes transition from an energy level with n=4 to an energy level with n=2?
20. Calculate the concentration of nitric acid in moles per litre in a sample which has a density 1.41gml^{-1} and the mass percent of nitric acid in it being 79%.
21. Chlorine is prepared in the laboratory by treating manganese dioxide with aqueous hydrochloric acid according to the reaction :
    $4HCl + MnO_2 \rightarrow 2H_2O + MnCl_2 + Cl_2$
    How many grams of HCl react with 5g of manganese dioxide?
22. Describe the hybridization in case of PCl_5. What are the axial bonds longer as compared to equatorial bonds?
23. Explain Resonance effect with an example.
24. Although geometries of NH_3 and H_2O molecules are distorted tetrahedral, bond angle in water is less than that of ammonia. Why?
25. What will be the pressure of the gaseous mixture when 0.5L of H_2 at 0.8 bar and 2L of dioxygen at 0.7 bar are introduced in a 1L vessel at 27°C?
26. Explain the formation of H_2 on the basis of valence Bond Theory.
27. Define Critical Temperature, Critical Pressure and Critical Volume.
28. Draw the molecular orbital diagram for O_2. Also state its electronic configuration, magnetic properties and bond order.
29. Derive Ideal Gas equation. Calculate the temperature of 4 mol of a gas occupying 5 dm^3 at 3.32 bar.
30. Write the general outer electronic configuration and characteristics of s-, p- , d- and f-block elements.

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DELHI PUBLIC SCHOOL, BAHADURGARH

SUMMATIVE ASSSESSMENT – II Sample Paper1

CLASS: XI

SUBJECT: CHEMISTRY

TIME: 3hours

M.MARKS: 70

GENERAL INSTRUCTIONS:

- All questions are compulsory.

- Question nos. 1 to 8 are very short answer type questions and carry 1mark each.
- Question nos. 9 to 18 are short answer type questions and carry 2marks each.
- Question nos. 19 to 27 are also short answer type questions and carry 3marks each.
- Question nos. 28 to 30 are long answer type questions and carry 5marks each.
- Use log tables if necessary, use of calculators is not allowed.

1. Define Open system.
2. What are the hybridization state of each carbon atom in CH_2═CH—CN?
3. In which condition does a reaction regarded non-spontaneous?
4. Indicate the σ and π bonds in C_6H_{12}.
5. Write IUPAC name for CH_2═CH—C≡C—CH_3.
6. Which of them is an electrophile: Cl^+ or HS^-?
7. Write structural formula of p-nitroaniline.
8. Explain position isomerism with an example.
9. State (a) Hund's Rule of Multiplicity (b) Pauli's Exclusion Principle
10. Draw the resonating structures for SO_3.
11. What will be the conjugate base for $H_2O$and H_2SO_4?
12. Calculate K_c for the following reaction at 1073K when K_p = 167:

$$CaCO_3\ (s) \rightleftharpoons CaO\ (s) + CO_2\ (g)$$

13. What happens when
    a) Borax is heated strongly
    b) Aluminium is treated with dilute NaOH.
14. State (a) Boyle's Law (b) Avogadro's Law
15. Write condensed and bond line structural formula for 2, 2, 4-trimethlpentane.
16. Draw cis and trans isomers for $C_2H_5CCH_3$═$CCH_3C_2H_5$.
17. Convert Benzene into
    a) p-nitrochlorobenzene
    b) acetophenone
18. Why does benzene undergo electrophilic substitution reactions easily?
19. Give reasons:
    a) Conc. HNO_3 can be transported in aluminium containers.
    b) Graphite is used as a lubricant.
    c) Aluminium alloys are used to make aircraft body.
20. Which out of NH_3 and NF_3 has higher dipole moment and why?
21. Yellow light emitted from a sodium lamp has a wavelength (λ) of 580nm. Calculate the frequency (υ) and wave number (ῡ) of the yellow light.
22. What will be the minimum pressure required to compress 500 dm^3 of air at 1 bar to 200 dm^3 at 30°C?
23. Derive Cp – Cv = R

24. Enthalpies of formation of CO (g), CO_2 (g), N_2O (g) and N_2O_4 (g) are -110. -393, 81 and 9.7 kJ mol^{-1} respectively. Find the value of ΔH for the following reaction:

$$N_2O_4\ (g) + 3CO\ (g) \longrightarrow N_2O\ (g) + 3CO_2\ (g)$$

25. At equilibrium, the concentrations of N_2 = 3.0 X 10^{-3} M, O_2 = 4.2 X 10^{-3} M and NO = 2.8 X 10^{-3} M in a sealed vessel at 800K. what will be Kc for the reaction

$$N_2\ (g) + O_2\ (g) \rightleftharpoons 2NO\ (g)$$

26. An alkene 'A' on ozonolysis gives a mixture of ethanol and pentan-3-one. Write the structure and IUPAC name of A.
27. Explain Resonance effect with an example.
28. Write the net ionic equation for the reaction of potassium dichromate (VI), $K_2Cr_2O_7$ with sodium sulphite, Na_2SO_3, in an acid solution to give chromium (III) ion and the sulphate ion.
29. Addition of HBr to propene yields 1-bromopropane. Explain the reaction and give the mechanism.
30. Explain the various types of electrophilic substitution reactions in benzene along with its mechanism.

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DELHI PUBLIC SCHOOL, BAHADURGARH

SUMMATIVE ASSESSMENT – II Sample paper

CLASS: XI

SUBJECT: CHEMISTRY (SET-2)

TIME: 3hours

M.MARKS: 70

GENERAL INSTRUCTIONS:

- All questions are compulsory.
- Question nos. 1 to 8 are very short answer type questions and carry 1mark each.
- Question nos. 9 to 18 are short answer type questions and carry 2marks each.
- Question nos. 19 to 27 are also short answer type questions and carry 3marks each.
- Question nos. 28 to 30 are long answer type questions and carry 5marks each.
- Use log tables if necessary, use of calculators is not allowed.

31. Define Closed system.
32. What are the hybridization state of each carbon atom in CH_3—CH═CH_2?
33. In which condition does a reaction regarded spontaneous?

34. Indicate the σ and π in C_6H_6.
35. Write IUPAC name of $CH_3—CH═C(CH_3)_2$
36. Which of them is a nucleophile : $C_2H_5O^-$ or NO_2^+
37. Write structural formula of o-ethylanisole.
38. Explain chain isomerism with an example.
39. State (a) Aufbau Principle (b) Heisenberg's Uncertainty Principle
40. Draw the resonating structures for NO_2.
41. State (a) Charle's Law (b) Gay Lussac's Law.
42. What will be the conjugate acid for NH_3 and $HCOO^-$?
43. Calculate K_c for the following reaction at 500K when $K_p = 1.8 \times 10^{-2}$:

$$2NOCl\ (g) \rightleftharpoons 2NO\ (g) + Cl_2\ (g)$$

44. What happens when
    a) Boric acid is added to water.
    b) BF_3 is reacted with ammonia.
45. Write condensed and bond line structural formula for 2, 2, 4-triethylhexane.
46. Draw cis and trans isomers for CHCl═CHCl.
47. Convert Benzene into
    c) p-nitrobromobenzene
    d) p-nitrotoluene
48. Why does benzene undergo nucleophilic substitution reactions with difficulty?
49. Give reasons:
    a) Diamond is used as an abrasive.
    b) Aluminium utensils should not be kept in water overnight.
    c) Aluminium wire is used to make transmission cables.
50. Describe the hybridization in PCl_5.
51. Find energy and frequency of each of the photons which correspond to light of wavelength of 0.50Å.
52. A vessel of 120mL capacity contains a certain amount of gas at 35°C and 1.2 bar pressure. The gas is transferred to another vessel of volume 180mL at 35°C. what would be its pressure?
53. Derive $\Delta H = \Delta U + \Delta nRT$
54. The reaction of cynamide, $NH_2CN(s)$, with dioxygen was carried out in a bomb calorimeter and ΔU was found to be -742.7 kJ mol^{-1} at 298K. Calculate enthalpy change for the reaction at 298K.

$$NH_2CN\ (g) + 3/2O_2\ (g) \longrightarrow N_2\ (g) + CO_2\ (g) + H_2O\ (l)$$

55. The following concentrations were obtained for the formation of NH3 from N2 and H2 at equilibrium at 500K. $[N_2] = 1.5 \times 10^{-2}$M, $[H_2] = 3.0 \times 10^{-2}$M and $[NH_3] = 1.2 \times 10^{-2}$M. Calculate equilibrium constant.
56. Propanal and pentan-3-one are the ozonolysis products of an alkene? What is the structural formula and IUPAC name of the alkene?

57. Explain Inductive effect with an example.
58. Permanganate ion reacts with bromide ion in basic medium to give manganese dioxide and bromate ion. Write the balanced ionic equation for the reaction.
59. Addition of HBr to propene yields 2-bromopropane. Explain the reaction and give the mechanism.
60. Explain the various types of electrophilic substitution reactions in benzene along with its mechanism.

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