



ANGEL'S PUBLIC SCHOOL

SAMPLE PAPER

HALF YEARLY EXAM SESSION 2023 – 24

CLASS – XI CODE – 043

SUBJECT : CHEMISTRY

TIME: 3 HRS

M.M:70

General Instruction.

SECTION – A (Q NO. 1 TO 15)CARRIES 1 MARKS EACH

SECTION – B (Q NO. 16 TO 23)CARRIES 2 MARKS EACH

SECTION – C (Q NO. 24 TO 31) CARRIES 3 MARKS EACH

SECTION – D (Q NO. 32 TO 34)CARRIES 5 MARKS EACH

ATTEMPT ALL QUESTIONS

USE OF CALCULATOR IS NOT ALLOWED

SECTION – A

Q1- An adiabatic expansion of an ideal gas always has

- (a) Decrease in temperature (b) $q = 0$ (c) $W = 0$ (d) $\Delta H = 0$.

Q2- For an endothermic reaction ΔS is positive, the reaction is

- (a) feasible when $T\Delta S > \Delta H$ (b) feasible when $\Delta H > T\Delta S$
(c) feasible at all temperature (d) Not feasible at all

Q3- Which of the following is not a state function?

- (a) ΔG (b) ΔE (c) W (d) H

Q4- The unit of entropy is _____.

- (a) joule (b) joule per mole (c) joule per Kelvin (d) joule per gram.

Q5- The quantity of heat measured for a reaction in a bomb calorimeter is equal to

- (a) ΔG (b) ΔH (c) $P\Delta V$ (d) ΔE

Q6- The bond energies of C-C, C=C; H-H and C-H linkages are 350, 600, 400 and 410 kJ per mole respectively. The heat of hydrogenation of ethylene is _____.

- (a) -170 kJ mol⁻¹ (b) -260 kJ mol⁻¹ (c) 400 kJ mol⁻¹ (d) -450 kJ mol⁻¹

Q7- Number of pi and sigma bonds in benzene are _____.

- [a] 3 & 12 [b] 12 & 12 [c] 6 & 11 [d] 6 & 6

Q8- The hybridisation of iodine in I_3^+ is _____.

- [a] sp^3 [b] sp^3d [c] sp^3d^2 [d] sp^3d^2

Q9- Which hybridisation is possible in square planer molecules?

- [a] sp^3d [b] dsp^3 [c] sp [d] sp^3d^2

Q10- The geometry of ClO_3^- ion according to VSEPR theory will be _____.

- [a] triangular planer [b] pyramidal [c] tetrahedral [d] square planer

Q11- Which of the following molecule is linear?

- [a] SO_2 [b] NO_2^+ [c] NO_2^- [d] SCl_2

Q12- Bond order of nitric oxide (NO) is _____.

- [a] 1 [b] 2 [c] 2.5 [d] 1.5

Q13- Two lone pair of electrons and two bond pair of electrons are present in _____.

- [a] NH_3 [b] BF_3 [c] H_2O [d] CO_2

Q14- In which of the following pair of both the molecules does not possess same type of hybridisation?

- [a] CH_4 and H_2O [b] PCl_5 and SF_4 [c] SF_6 and XeF_4 [d] BCl_3 and NCl_3

Q15- Hybridisation in SO_2 is _____.

- [a] sp [b] sp^2 [c] sp^3 [d] sp^3d

SECTION – B

Q16 . Explain sp hybridisation in detail?

Q17. Name the element in periodic table having highest electron affinity and Size ?

Q18. Write postulates of molecular orbital theory

Q19. Explain screening effect and shielding effect ? How it affects the ionisation energy?

Q20. Calculate no. of atoms in [a] 88.0 g of CO_2 [b] 10 gram atoms of Na

Q21. Arrange elements of second period on the basis of ionisation energy . Give reason

Q22. The enthalpy of combustion of propane is -2050 kJ . the bond energy of C—C, C—H, C=O , O—H are 347, 414, 741, 464 kJ . Calculate bond enthalpy of O=O molecule?

Q23. What is the number of photons of light with a wavelength of 4000nm that provide 1.0J of energy?

SECTION – C

Q24. Calculate the wavenumber and frequency for shortest wavelength of Bracket series?

Q25. What are maximum number of emission lines when the excited electron of H atom?

(1) in $n=6$ drops to ground state (2) $n=5$ to 2nd state?

Q26. What is node ? Draw shape of d_{xy} and d_{zx} orbitals

Q27. Explain isothermal workdone.

Q28 Derive de Broglie relation. What is its significance?

Q29. Draw molecular orbital energy diagram of N_2^+ molecule and find its bond order , magnetic property and electronic configuration ?

Q30. Derive relation between ΔH and ΔE

Q 31. Define and prove Hess's law.

SECTION – D

Q32. Draw the structure and write shape and hybridization of the following

- [1] I_3^+ [2] SF_4 [3] XeO_2F_2 [4] PO_4^{3-} [5] H_2SO_4

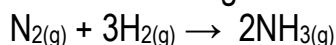
OR

Calculate the enthalpy of formation of acetic acid if its enthalpy of combustion is -867 kJ/mol . The enthalpies of formation of CO_2 and H_2O are -393.5 and -285.9 kJ/mol .

Q 33- Draw molecular orbital energy level diagram of O_2 , O_2^+ , O_2^{2+} , O_2^- , O_2^{2-} and arrange them on the basis of

[i] bond order [ii] bond length [iii] bond dissociation energy [iv] magnetic character

Q34. The heat change at constant pressure for following reaction is -92.28 kJ at 298 K.



Calculate the heat change at constant volume and at the same temperature

OR

Calculate the enthalpy of formation of ethene . if its enthalpy of combustion is -1323 kJ . And enthalpy of formation of CO_2 and H_2O are -393.5 kJ and -249 kJ