## ASSIGNMENT- PHYSICS
## CLASS XI
## SYSTEM OF PARTICLES AND ROTATIONAL MOTION

1. Why an ice skater or a ballet dancer does sometimes stretches their hands and sometimes brings Them closer to the body while performing their routines?

2. If angular momentum is conserved in a system whose moment of inertia is decreased, will its rotational kinetic energy be also conserved?

3. Two circular discs A and B of the same mass and same thickness are made of two different metals whose densities are dA and dB (dA>dB). Their moments of inertia about the axes passing through their

centres of gravity and perpendicular to their planes are IA and IB. Which is greater; IA or IB?

4. Torques of equal magnitude is applied to hollow cylinder and a solid sphere, both having the same mass and radius. The cylinder is free to rotate about its standard axis of symmetry and the sphere is free to rotate about an axis passing through its centre. What is the ratio of their angular acceleration?

5. A ring, a disc and a sphere all of the same radius and mass roll down an inclined plane from the same

height h. Which of the three reaches the bottom (i) earliest (ii) latest?

6. A ring, a disc and a sphere all of the same radius and mass roll down an inclined plane from the same

height h without slipping. They start from rest. Which of the three reaches the bottom with maximum velocity?

7. A solid sphere rolls down two different inclined planes of same heights but different angles of inclination.

(i) Will it reach the ground with the same speed in each case?

(ii) Will it take longer to roll down one plane than another? If so, which one and why?

8. What is the moment of inertia of a uniform circular disc and circular ring of radius R and mass M about

(i) Diameter of the disc and ring

(ii) An axis passing through a point on its edge and normal to the disc?

(iii) A tangent in the plane of the disc and ring. M.I. about an axis passing through its centre and perpendicular to it is ½ MR$^2$

 and MR$^2$.

9. Two particles of mass 2kg and 1kg are moving along the same straight line with speeds of 2m/s and 5m/s respectively. What is the speed of the centre of mass of the system if both the particles are moving (i) in same direction and (ii) in opposite direction? [ 3m/s, 1/3 m/s]

10. What will be the duration of the day, if earth suddenly shrinks to 1/64 th of its original volume? [1.5 hr]

11. Energy of 484 J is spent in increasing the speed of a flywheel from 60 to 360 rpm. Calculate MI of Flywheel. [0.7kgm2]

12. A disc of mass 5 kg and radius 50 cm rolls on the ground at the rate of 10m/s. Calculate the K.E. of the disc. (Given I = ½ MR2). [375 J]

13. A particle starts rotating from rest according to the formula $\theta = 3t^3/20 - t^2/3$. Calculate the angular Velocity and angular acceleration after 5 seconds. [ 7.92 rad/s, 3.83 rad/s2]

14. A spherical ball rolls on a table without slipping. Determine the percentage of its K.E. which is Rotational. M.I. of sphere = 2/5 MR2. [28.57%]

KENDRIYA VIDYALAYA SANGATHAN
CHANDIGARH REGION
PRACTICE PAPER CHEMISTRY
CLASS XI

MM 70                                                                                                    TIME 3 HRS
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General instruction:

Read the following instructions carefully.

a) There are 35 questions in this question paper with internal choice.

b) SECTION A consists of 18 multiple-choice questions carrying 1 mark each.

c) SECTION B consists of 7 very short answer questions carrying 2 marks each.

d) SECTION C consists of 5 short answer questions carrying 3 marks each.

e) SECTION D consists of 2 case- based questions carrying 4 marks each.

f) SECTION E consists of 3 long answer questions carrying 5 marks each.

g) All questions are compulsory.

h) Use of log tables and calculators is not allowed.


**SECTION-A**

The following questions are multiple-choice questions with one correct answer. Each question carries 1 mark. There is no internal choice in this section.

| Sr. No. | MCQs | Marks |
|---|---|---|
| 1. | Formation of CO and $CO_2$ illustrates the law of ——————. <br> (a) Law of conservation of mass     (b) Law of Reciprocal proportion <br> (c) Law of Constant Proportion     (d) Law of Multiple Proportion | 1 |
| 2. | Which of the following pairs of gases contains the same number of molecules? <br> (a) 8 g of $O_2$ and 7 g of $N_2$     (b) 8 g of $O_2$ and 4.4 g of $CO_2$ <br> (c) 28 g of $N_2$ and 22 g of $CO_2$     (d) 32 g of $O_2$ and 14g of $N_2$ | 1 |
| 3. | Which of the Following Statements about a Compound is Incorrect One? <br> (a) A molecule of a compound has atoms of different elements. <br> (b) The ratio of atoms of different elements in a compound is fixed <br> (c) A compound retains physical properties of its associated constituent elements <br> (d) A compound cannot be separated into its constituent elements by physical methods of separation | 1 |
| 4. | Molarity of a solution that prepared by dissolved 5.85 g of NaCl(s) in 100 mL is- <br> (a) 3.65 mol/L     (b) 10 mol/L     (c) 0.1 mol/L     (d) 1 mol/L | 1 |
| 5. | One Gram Molecule of Benzene is Equal to_____? <br> (a) 10 g $C_6H_6$     (b) 70 g $C_6H_6$     (c) 72 g $C_6H_6$    (d) 78 g $C_6H_6$ | 1 |

| 6. | Which of the following statements do not form a part of Bohr's model of hydrogen atom?<br>(a) Energy of the electrons in the orbits are quantized<br>(b) The electron in the orbit nearest the nucleus has the lowest energy<br>(c) Electrons revolve in different orbits around the nucleus<br>(d) The position and velocity of the electrons in the orbit cannot be determined simultaneously. | 1 |
|---|---|---|
| 7. | How many unpaired electron present in $Cu^+$ ion<br>    a) 1            b) 6            c) 0            d) 10 | 1 |
| 8. | The last entering electron in an element has quantum number $n = 3, l = 2, m = +2$ and $s = +1/2$. The atomic number of the element will be<br>(a) 13        (b) 21        (c) 29        (d) 39 | 1 |
| 9. | The group number, number of valence electrons, and valency of an element with the atomic number 15, respectively, are:<br>(a) 16, 5 and 2    (b) 15, 5 and 3      (c) 16, 6 and 3        (d) 15, 6 and 2 | 1 |
| 10. | The most polar bond is<br>(a) C – F        (b) C – O        (c) C – Br        (d) C – S | 1 |
| 11. | Among the following the electron deficient compound is<br>(a) $BCl_3$        (b) $CCl_4$        (c) $PCl_5$        (d) $BeCl_2$ | 1 |
| 12. | Which one of the following statement is false?<br>(a) Work is a state function<br>(b) Temperature is a state function<br>(c) Change in the state is completely defined when the initial and final states are specified<br>(d) Work appears at the boundary of the system | 1 |
| 13. | One mole of which of the following has the highest entropy?<br>(a) Liquid Nitrogen     (b) Hydrogen Gas     (c) Mercury    (d) Diamond | 1 |
| 14. | Based on the first law of thermodynamics, which one of the following is correct?<br>(a) For an isothermal irreversible change , q = +w<br>(b) For an isochoric process, $\Delta U$ = -q<br>(c) For an adiabatic process, $\Delta U$ = -w<br>(d) For isothermal irreversible change , q = -w | 1 |
| 15. | Given below are two statements labelled as Assertion (A) and Reason (R)<br> Assertion (A): The empirical mass of Ethene is half of its molecular mass.<br> Reason (R ) : The empirical formula represents the simplest whole number ratio of various atoms present in a compound<br><br>Select the most appropriate answer from the options given below:<br>a) Both A and R are true and R is the correct explanation of A<br>b) Both A and R are true but R is not the correct explanation of A.<br>c) A is true but R is false.<br>d) A is false but R is true. | 1 |
| 16. | Assertion (A): the atomic mass of most of the elements are fractional<br>Reason (R): most of elements occurs as mixture of isotopes.<br>Select the most appropriate answer from the options given below:<br>a) Both A and R are true and R is the correct explanation of A<br>b) Both A and R are true but R is not the correct explanation of A.<br>c) A is true but R is false.<br>d) A is false but R is true. | 1 |

| 17. | Assertion (A): Each orbital is designated by three quantum numbers labelled as n, l and $m_l$.<br>Reason (R): 'n' is a positive integer with value of n = 1,2,3.<br><br>Select the most appropriate answer from the options given below:<br>a) Both A and R are true and R is the correct explanation of A<br>b) Both A and R are true but R is not the correct explanation of A.<br>c) A is true but R is false.<br>d) A is false but R is true. | 1 |
|---|---|---|
| 18. | Assertion (A): According to Mendeléev, the properties of elements are a periodic function of their atomic masses.<br>Reason (R) : Atomic number is equal to the number of protons<br><br>Select the most appropriate answer from the options given below:<br>a) Both A and R are true and R is the correct explanation of A<br>b) Both A and R are true but R is not the correct explanation of A.<br>c) A is true but R is false.<br>d) A is false but R is true. | 1 |

**SEC :B**

This section contains 7 questions with internal choice in two questions. The following Questions are very short answer type and carry 2 marks each.

| 19. | a) How many seconds are there in 2 days (Unit method calculation)?<br>b) How are 0.50 mol $Na_2CO_3$ and 0.50 M $Na_2CO_3$ different? | 1+<br>1 |
|---|---|---|
| 20. | Calculate the energy of each of the photons which<br>(a) correspond to light of frequency $3 \times 10^{15}$ Hz<br>(b) have wavelength of 0.50 $^0$A.<br><div align="center">OR</div><br>Yellow light emitted from a sodium lamp has a wavelength of 580 nm. Calculate the frequency (v) and wave number (v-) of yellow light. | 1+<br>1<br><br><br>2 |
| 21. | Consider the following species:<br>$N^{3-,}$ $O^{2-,}$ $F^-$, $Na^+$, $Mg^{2+,}$ $Al^{3+}$<br>(a) What is common in them?<br>(b) Arrange them in order of increasing ionic radii? | 2 |
| 22. | Using the Periodic Table, predict the formulas of compounds which might be formed by the following pairs of elements;<br>(a) silicon and bromine (b) aluminium and sulphur | 2 |
| 23. | Calculate the standard enthalpy of formation of $CH_3OH$. from the following data:<br>(i) $CH_3OH(l) + 3/2\ O_2$ (g) ————> $CO_2$ (g) + $2H_2O$ (l); $\Delta_r H^0 = -726$kj $mol^{-1}$<br>(ii) C(s) + $O_2$(g) ————>$CO_2$ (g); $\Delta_c H^0 = -393$ kj $mol^{-1}$<br>(iii) $H_2$(g) + $1/2O_2$(g) ————>$H_2O$ (l); $\Delta_f H^0 = -286$ kj $mol^{-1}$<br><br><div align="center">OR</div><br>The enthalpy of combustion of methane, graphite and di hydrogen at 298 K are -890.3 KJ $mol^{-1}$, – 393.5 KJ $mol^{-1}$ and – 285.8 KJ $mol^{-1}$ respectively. Calculate Enthalpy of formation of $CH_4$(g) | 2<br><br><br><br><br><br><br><br><br>2 |
| 24. | a) Explain why $BeH_2$ molecule has a zero dipole moment although the Be—H bonds are polar.<br>b) Which out of $NH_3$ and $NF_3$ has higher dipole moment and why? | 1+<br>1=<br>2 |

| 25. | (a) What is bond energy? Why is it called enthalpy of atomisation?<br>(b) Write the Relationship between Cp and Cv for an Ideal Gas. | 1+<br>1=<br>2 |
|---|---|---|
| | **SECTION : C**<br>This section contains 5 questions with internal choice in two questions. The following questions are short answer type and carry 3 marks each | |
| 26. | 50.0 kg of $N_2$ (g) and 10.0 kg of $H_2$ (g) are mixed to produce $NH_3$ (g). Calculate the amount of $NH_3$ (g) formed. Identify the limiting reagent in the production of $NH_3$ in this situation.<br><div align="center">OR</div><br>A compound contains 4.07% hydrogen, 24.27% carbon and 71.65% chlorine. Its molar mass is 98.96 g. What are its empirical and molecular formulas? | 2+<br>1<br><br><br><br>3 |
| 27. | (a) Write designation of an orbital having n = 5, l = 3.<br>(b) Name the spectral line series in the spectrum of H-atom obtained when an electron jumps from n = 4 to n = 2.<br>(c ) Define Zeeman effect. | 1<br><br>1<br>1 |
| 28. | a) Show by a chemical reaction with water that $Na_2O$ is a basic oxide and $Cl_2O_7$ is an acidic oxide.<br>b) Give the general electronic configuration of the transition elements. | 2<br><br>1 |
| 29. | a) Geometries of $NH_3$ and $H_2O$ molecules are distorted tetrahedral but bond angle in water is less than that of ammonia, why?<br>b) Draw the resonance structures of carbonate $(CO_3^{2-})$ion .<br>c) Both $CO_2$ and $H_2O$ are triatomic molecules, the shape of $H_2O$ molecule is bent while that of $CO_2$ is linear, why? | 1<br><br>1<br><br>1 |
| 30. | (a) Out of 1 mole of $H_2O(g)$ and 1 mole of $H_2O(l)$ which one will have greater entropy?<br>(b) what will be the value of $\Delta G°$ for boiling water?<br>( c) What is meant by the term state function? Give one example.<br><div align="center">OR</div><br>Define entropy. And prove that entropy is an extensive property. | 3<br><br><br><br><br>3 |
| | **SECTION : D**<br>The following questions are case-based questions. Each question has an internal choice and carries 4 (1+1+2) marks each. Read the passage carefully and answer the questions that follow | |
| 31. | The spectrum of radiation emitted by a substance that has absorbed energy is called an emission spectrum. Atoms, molecules or ions that have absorbed radiation are said to be "excited". To produce an emission spectrum, energy is supplied to a sample by heating it or irradiating it and the wavelength (or frequency) of the radiation emitted, as the sample gives up the absorbed energy, is recorded. An absorption spectrum is like the photographic negative of an emission spectrum. A continuum of radiation is passed through a sample which absorbs radiation of certain wavelengths. The missing wavelength which corresponds to the radiation absorbed by the matter, leave dark spaces in the bright continuous spectrum. The study of emission or absorption spectra is referred to as spectroscopy. The spectrum of the visible light, as discussed above, was continuous as all wavelengths (red to violet) of the visible light are represented in the spectra.<br><br>a) State dual nature of matter ( de Broglie equation and statement )<br>b) The Spectral Lines for Atomic Hydrogen shown in visible region are in --------------series<br>c) Distinguish between an Emission spectrum and an Absorption spectrum. | <br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br>[1]<br>[1]<br><br>[2] |

| 32. | In order to explain the characteristic geometrical shapes of polyatomic molecules like $CH_4$, $NH_3$ and $H_2O$ etc., Pauling introduced the concept of hybridisation. According to him the atomic orbitals combine to form new set of equivalent orbitals known as hybrid orbitals. Unlike pure orbitals, the hybrid orbitals are used in bond formation. The phenomenon is known as hybridisation which can be defined as the process of intermixing of the orbitals of slightly different energies so as to redistribute their energies, resulting in the formation of new set of orbitals of equivalent energies and shape. For example when one 2s and three 2p-orbitals of carbon hybridise, there is the formation of four new $sp^3$ hybrid orbitals. | |
|---|---|---|
| | a) Why axial bonds are weaker than equatorial bonds in $PCl_5$ | [1] |
| | b) What is the shape of compound undergoing $sp^3d$ hybridization? | [1] |
| | c) Explain conditions for Hybridisation (any two ) | [2] |
| | **SECTION :E** The following questions are long answer type and carry 5 marks each. Two questions have an internal choice. | |
| 33. | (a) Explain Heisenberg's Uncertainty Principle and its significance. (b) What is the maximum number of emission lines when the excited electron of a hydrogen atom in n = 6 drops to the ground state ? ( c) What are degenerate orbitals ? (d) Arrange X-rays, cosmic rays and radio waves according to frequency. OR (a) State and explain the following: (i) Aufbau principle (ii) Pauli exclusion principle. (iii) Hund's rule of maximum multiplicity. (b) (i) How many sub-shells are associated with n = 4 ? (ii) How many electrons will be present in the sub-shells having ms value of -1/2 for n = 4 ? | 1 +1 1 1 1 1+ 1+ 1 1+ 1 |
| 34. | a) On the basis of MOT, find the bond order of the following and Compare their relative stability also indicate their magnetic properties. $O_2$, $O_2^+$ $O_2^-$ (Superoxide),$O_2^{2-}$ (peroxide) b) What is the total number of sigma and pi bonds in the following molecules? (i) $C_2 H_2$ (ii) $C_2 H_4$ OR (a) Draw diagrams showing the formation of a double bond and a triple bond between carbon atoms in $C_2 H_4$ and $C_2 H_2$ molecules. (b) Is it possible for a non polar molecule to have  polar bonds?, give one example. ( c) Use molecular orbital theory to explain why the $Be_2$ molecule does not exist. (d) Write the structure and hybridisation in case of $PCl_5$. | 3 2 2 1 1 1 |
| 35. | Explain the following a) Chlorine have more negative electron gain enthalpy than fluorine b) Write the symbol and IUPAC name for atom with atomic no 102. c) Write the electronic configuration of trivalent ion of element for Z= 26 d) What Are the oxidation state and covalency of Al in [Al Cl $(H_2O)_5$ ] $^{2+}$ ? e) State the Modern Periodic Law | 1 x 5= 5 |

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## KENDRIA VIDYALAYA SANGATHAN JAIPUR REGION
## HALF YEARLY EXAMINAION 2022-23

**TIME:3hrs.**                                   **CLASS-XI**                                   **M.M:70**
## Subject: Chemistry

**General Instructions: Read the following instructionscarefully.**

**a)** There are 35 questions in this question paper with internalchoice.
**b)** SECTION A consists of 18 multiple-choice questions carrying 1 markeach.
**c)** SECTION B consists of 7 very short answer questions carrying 2 markseach.
**d)** SECTION C consists of 5 short answer questions carrying 3 markseach.
**e)** SECTION D consists of 2 case- based questions carrying 4 markseach.
**f)** SECTION E consists of 3 long answer questions carrying 5 markseach.
**g)** All questions are compulsory.
**h)** Use of log tables and calculators is notallowed

## SECTION A

**Q1**.Which has the maximum number of molecules among the following?

(a) 8 g $H_2$ (b) 64 g $SO_2$  (c) 44 g $CO_2$ (d) 48 g $O_3$

**Q 2.**An organic compound contains carbon , hydrogen and oxygen. Its elemental analysis gave C, 38.71% and H, 9.67%. The empirical formula of the compound would be
(a) CHO (b) $CH_4O$ (c) $CH_3O$  (d) $CH_2O$

**Q 3.**Which of the following statements in relation to the hydrogen atom is correct?
(a) 3s orbital is lower in energy than 3p orbital
(b) 3p orbital is lower in energy than 3d orbital
(c) 3s and 3p orbitals are of lower energy than 3d orbital
(d) 3s, 3p and 3d orbitals all have the same energy

**Q4.**The electronic configuration of silver atom in ground state is
(a) $[Kr]3d^{10}4s^1$(b) $[Xe]4f^{14}5d^{10}6s^1$
(c) $[Kr]4d^{10}5s^1$(d) $[Kr]4d^95s^2$

**Q5.**Which of the following sets of quantum numbers represents the highest energy of an atom?
(a) n = 3, l = 0, m = 0, s = + 1/2
(b) n = 3, l = 1, m = 1, s = + 1/2
(c) n = 3, l = 2, m = 1, s = + 1/2
(d) n = 4, l = 0, m = 0, s = + 1/2
**Q6.**The group number, number of valence electrons, and valency of an element with the atomic number 15, respectively, are:
(a) 16, 5 and 2   (b) 15, 5 and 3   (c) 16, 6 and 3   (d) 15, 6 and 2

**Q7.**Arrange S, O and Se in order of less –ve to more –ve value of electron gain enthalpy

(a) Se < O < S   (b) Se < S < O   (c) S < O < Se   (d) S < Se < O

**Q8.**Which of the following oxides is amphoteric in character?

(a) $SnO_2$ (b) $CO_2$ (c) $SiO_2$ (d) CaO

**Q9.**The structure of $IF_7$ is

(a) Pentagonal bipyramid    (b) Square pyramid
(c) Trigonal bipyramid   (d) Octahedral

**Q10.**The charge/size ratio of a cation determines its polarizing power. Which one of the following sequences represents the increasing order of the polarizing order of the polarizing power of the cationic species, $K^+$, $Ca^{++}$, $Mg^{2+}$, $Be^{2+}$?

(a) $Ca^{2+} < Mg^{2+} < Be^+ < K^+$ (b) $Mg^{2+} < Be^{2+} < K^+ < Ca^{2+}$
(c) $Be^{2+} < K^+ < Ca^{2+} < Mg^{2+}$ (d) $K^+ < Ca^{2+} < Mg^{2+} < Be^{2+}$

**Q11.**The species which by definition has ZERO standard molar enthalpy of formation at 298 K is

(a) $Br_2(g)$  (b) $Cl_2(g)$  (c) $H_2O(g)$   (d) $CH_4(g)$

**Q12.**In which of the following process, a maximum increase in entropy is observed?

(a) Dissolution of Salt in Water     (b) Condensation of Water
(c) Sublimation of Naphthalene     (d) Melting of Ice

**Q13.**The enthalpies of combustion of carbon and carbon monoxide are -393.5 and -283.0 kJ $mol^{-1}$ respectively. The enthalpy of formation of carbon monoxide is:

(a) -676 KJ  (b) 110.5 KJ (c) -110.5 KJ (d) 676.5 kJ

**Q14.**The correct order of increasing C – O bond length of CO, $CO_2$ , $CO_3^{-2}$ is

(a) $CO < CO_2 < CO_3^{-2}$ (b) $CO_2 < CO < CO_3^{-2}$

(c) $CO_3^{-2} < CO < CO_2$ (d) $CO_3^{-2} < CO_2 < CO$

**In the following questions a statement of assertion (A) followed by a statement of Reason (R) is given. Choose the correct option out of the choices given below for each question. (i) A and R both are correct, and R is correct explanation of A. (ii) A and R both are correct, but R is not the correct explanation of A. (iii) A is true but R is false. (iv) A and R both are false.**

**Q15.Assertion :** Enthalpy of formation of $H_2O(l)$ is greater than that of $H_2O(g)$.

**Reason :** Enthalpy change is negative for condensation reaction, $H_2O(g)$ to $H_2O(l)$

**Q16.Assertion :** A resonance hybrid is always more stable than any of its canonical structures

**Reason :** This stability is due to delocalization of electrons

**Q17.Assertion :** When 4 moles of $H_2$ reacts with 2 moles of $O_2$, then 4 moles of water is formed.

**Reason**: $O_2$ will act as limiting reagent.

**Q18.Assertion:** $Fe^{+3}$ ion is more stable than $Fe^{+2}$ ion in the ground state.

**Reason:** $Fe^{+3}$ ion has a greater number of unpaired electrons than Fe+2 ion in the ground state.

## SECTION B

**Q19.**How many molecules are there in 10.0 liters of a gas at a pressure of 75 cm at 27°C?

### OR

Calculate:
(a) Mass of 2.5 gram atoms of magnesium,
(b) Gram atom in 1.4 grams of nitrogen (Atomic mass Mg = 24, N = 14)

**Q20**. Using s, p and d notations, describe the orbitals with following quantum numbers :
(a) n = 1, l = 0 (b) n = 4, l = 3 (c) n = 3, l = 1 (d) n = 4, l = 2

**Q21**. If the velocity of the electron in Bohr's first orbit is $2.19 \times 10^6$ m s$^{-1}$, calculate the de Brogile wavelength associated with it.

**Q22.** Define the term ionization enthalpy? How does it vary along a period and along a group?

**Q23.**Define bond order. How is it related to the stability of a molecule?

**Q24.**Describe the change in hybridisation (if any) of the Al atom in the following reaction.  $AlCl_3 + Cl^- \longrightarrow AlCl_4^-$ .

**Q25.**Enthalpy of combustion of carbon to carbon dioxide is – 393.5

J mol$^{-1}$ ·Calculate the heat released upon formation of 35.2 g of $CO_2$ from carbon and oxygen gas.

### OR

Define the following:
(i) First law of thermodynamics. (ii) Standard enthalpy of formation.

## SECTION C

**Q26.** A compound contains 4.07 % hydrogen, 24.27 % carbon and 71.65 % chlorine. Its molar mass is 98.96 g. What are its empirical and molecular formulas?

### OR

What is the percentage of carbon, hydrogen and oxygen in ethanol?

**Q27.** Write the 3 points of difference between orbit and orbital.

**Q28.** State (a)Hund's Rule of maximum Multiplicity (b) Aufbau Principle

(c) n+l rule

**Q29.**Write answers of any three of the followings-

(a) State Hess's Law for constant heat summation?

(b) Give relationship between H, U for a reaction in gaseous state.

(c) What is the  enthalpy (H) of all elements in their standard state.

(d) From thermodynamic point to which system the animals and plants belong?

**Q30.** Justify the following statements:

(a) An endothermic reaction is always thermodynamically spontaneous.

(b) The entropy always increases on going from liquid to vapour state at any temperature T.

<div align="center">SECTION D</div>

**The following questions there are case-based questions. Each question carries 4 (1+1+2) marks each. Read the passage carefully and answer the questions that follows-**

**Q31. Read the given passage and answer the questions that follow:**
Stoichiometry is a section of chemistry that involves calculation based on chemical equations. Chemical equations are governed by laws of chemical combination. Mass of reactants is equal to mass of products. Compound obtained from different methods contain the same elements in the fixed ratio by mass. Mole is a counting unit, equal to $6.022 \times 10^{23}$ particles. One mole is also equal to molar mass expressed in grams. One mole of every gas at STP has volume equal to 22.4 L. The reacting species which are consumed in the reaction completely is called limiting reagent which decides amount of products formed. Concentration of solution is expressed in terms of molarity, molality and mole fraction.

(a) Define one mole?

(b) Calculate number of electrons in 18 g of $H_2O$.

(c) Calculate number of moles of $NH_3$ formed by reaction of 2 moles of $N_2$ and 2 moles of $H_2$, $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

<div align="center">OR</div>

(c) Calculate the number of atoms in each of the following

 (i) 52 moles of Ar (ii) 52 u of He

**Q32. Read the passage and answer the questions that follow:**

The atomic and ionic radii decrease with increase in atomic number along a period from left to right. Atomic size and ionic size increases down the group. Ionisation enthalpy decreases down the group and increases along a period from left to right. It

also depends upon shielding effect as well as stability of electronic configuration. Electronegativity decreases down the group but increases along the period.

(a) Arrange the elements of second period in increasing order of first ionisation enthalpy.

(b) Arrange the elements of group 13 in increasing order of atomic size.

(c) Why do noble gases have +ve electron gain enthalpies?

**OR**

(c) Why does K and Rb have same electronegativity although Rb is bigger than K?

## SECTION E

**The following questions are long answer type and carry 5 marks each.**

**Q33.**(a) State Heisenberg's uncertainty principle. Give its mathematical expression.

(b) If the position of the electron is measured within an accuracy of ± 0.002 nm, calculate the uncertainty in the momentum of the electron. Suppose the momentum of the electron is $h/4\pi$ x 0.05 nm. Is there any problem in defining this value ?

**OR**

(a) How many sub-shells are associated with n = 4 ?
(b) How many electrons will be present in the sub-shells having ms value of -1/2 for n = 4 ?

(C)Indicate the number of unpaired electrons in :
(i) P (ii) Si (iii) Cr (iv) Fe

**Q34.**(a) Explain why the $BeH_2$ molecule has a zero dipole moment although the Be-H bonds are polar.

(b)Describe the hybridisation in case of $PCl_5$. Why are the axial bonds longer as compared to equatorial bonds?

**OR**

(a) Write the important conditions required for the linear combination of atomic orbitals to form molecular orbitals.(any two point)

(b)Define Lattice energy. How is Lattice energy influenced by (i) Charge on the ions (ii) Size of the ions?

**Q35.** (A) What are extensive property and intensive properties?

(B) Calculate the enthalpy of formation of benzene from data

$$C_6H_{6(l)} + \frac{15}{2}O_{2(g)} \rightarrow 6CO_{2(g)} + 3H_2O_{(l)}, \Delta_cH^0 = -3266.0KJ$$

$$C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} \qquad\qquad \Delta_fH^0 = -393.1KJ$$

$$H_{2(g)} + \frac{1}{2}O_{2(g)} \rightarrow H_2O_{(l)} \qquad \Delta_fH^0 = -286.0KJ$$
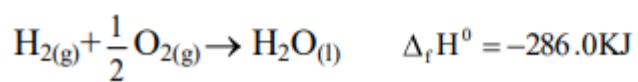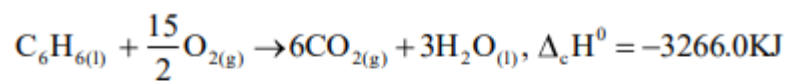
## 1.Note making

1. The one industry that remains unaffected by any depression in trade is the beauty industry. The women world over continue to spend money on their faces and bodies even when there is a great slump in other areas of trade. The number of advertisements proclaiming the miracles performed by the various beauty aids goes to support the fact that, today, with all the talk about emancipation, equality of sexes and feminism, women are still observed with their physical beauty as they were in the times of Cleopatra.

2. America leads the figures, literally and metaphorically. Many parts of Europe by virtue of being affected by political and economic instability, leave precious little for women to beautify themselves. May be, all that women in Europe, can then do is to wash and hope for the best. But, the rich and upper middle class women, everywhere in the world, block a substantial amount of their income on beautifying themselves. Why is it so?

3. The richer the man gets the more obsessed he becomes with high powered cars and electronic gadgets and bank balances. On the contrary, the women, especially the urban upper middle class women, find their bodies and faces worthy of investing a major part of their income.

4. Women, these days, are much freer than they were in the last century. Not only are they free to take part in social and professional functions of a society as an equal to man, but also to look attractive in any given situation. The beauty industry is shrewd enough to exploit this trend and women in every walk of life have something to buy from the range of products that the beauty industry offers. The British matron, today, is the thing of the past.

5. As a result of the number of beauty parlours that have sprung up in every street corner of the metropolises, and the exercises, the health motors and the skin foods that they offer, you can hardly run into an old woman these days. One could say 'old ladies' are fast becoming an extinct species. White hair, wrinkles, bent backs and hollow cheeks are features of a bygone era. Cosmetic surgery has slowly eradicated these unwanted phenomena. If children of posterity want to look at an old woman, they might have to run to an art gallery and find a medieval                                                                                   painting.

1. On the basis of your reading of the passage make notes on it, using recognizable abbreviations wherever necessary. Use a suitable format. Supply an appropriate title.   **5**
2. Make a summary of the passage.

 2.You are Anurag /Aparna of 110, Swasthya Vihar, New Delhi and wish to let out a portion of your newly built house. Draft advertisement in not more than 50 words for publication in the 'To Let' column of The Hindustan Times, giving all necessary details like location, type of accommodation to be rented out, rent expected, contact address including telephone number etc.

3.You have been transferred to another city. You want to sell certain household goods. Draft a suitable advertisement to be inserted in a newspaper

4. While science is a good slave, it can be a bad master. Write a short speech to be delivered in the morning assembly of your school, advising students not to let gadgets and gizmos drive them, but to employ these to their advantage.

5.**"Academic excellence is the only requirement for a successful career."** Write a debate either for or against the motion. (120 – 150 words)

# KENDRIYA VIDYALAYA NO 4 ONGC VADODARA

# HOLIDAY HOMEWORK

## (Autumn Break)

## CLASS – XI

1. IPO cycle
2. Functional units of computer.
3. Difference between hardware and software
4. Difference between system software & Application software
5. Difference between RAM and ROM
6. Types of RAM AND ROM.
7. Difference between compiler and interpreter.
8. Difference between list and tuple.
9. Mutable and immutable type
10. Learn String functions.
11. Practice Basic Python programs.
12. Write Python Program in practical notebook.

# केन्द्रीय विद्यालय क्र 4, ओ एन जी सी, वडोदरा
## शरद कालीन अवकाश गृहकार्य
## विषय – हिन्दी

## कक्षा – ग्यारहवीं

परियोजना कार्य –

निर्देश –

1 परियोजना कार्य मौलिक और हस्तलिखित होना है ।

2 परियोजना कार्य 12 से 15 पृष्ठ का होना चाहिए ।

| क्र सं | विद्यार्थी का नाम | परियोजना कार्य का विषय – |
|---|---|---|
| 1 | अनुजा गायकवाड | पारंपरिक व्यवसाय और नई पीढ़ी |
| 2 | लिपिका सिंह | प्रेमचंद की कहानियों में समाज का चित्रण |
| 3 | लकी शेखर | मीरा के समय के समाज और आज के समाज की तुलना |
| 4 | पवन राय | हिन्दी के प्रचार- प्रसार में सिनेमा की भूमिका |
| 5 | कीर्तिराज सिंह | जल संकट और उसका समाधान |
| 6 | प्रिया सरकले | पर्यावरण से छेड़छाड़ से ऋतु चक्र में परिवर्तन |
| 7 | वैभव मिश्रा | कबीर का सचित्र परिचय और उनके साहित्य की विशेषताएं |
| 8 | वंदना | वर्तमान समाज और नारी की स्थिति |
| 9 | कार्तिक | भ्रष्टाचार हमारे देश की समस्या और उसका समाधान |
| 10 | कृदय | सोशल मीडिया में हिन्दी की भूमिका |
| 11 | श्रीवाणी | हिन्दी के प्रचार और प्रसार में पत्रिकाओं का योगदान |
| 12 | तनवीर | जाति-प्रथा वर्तमान समाज के लिए घातक |
| 13 | अंशिका | स्वतंत्रता से पूर्व हिन्दी के कवियों का योगदान |
| 14 | मोहम्मद साहिल | समाज की उन्नति में शिक्षा का योगदान |
| 15 | गरिमा सिंह | देश और समाज के परिवर्तन में दुष्यन्त कुमार का योगदान |

**Kendriya Vidyalaya no.4, ONGC, vadodara**

**Holidays h.w( Autumn Break )**

**Class – 11**

**Subject: Mathematics**

**Session: 2023-24**

**I . Write about 5 mathematician in project file ( use A-4 size paper)**

**2. Solve the following questions in cw/hw note book**

1. If $^{n}C_9 = {}^{n}C_2$ then find $^{n}C_5$.

2. How many 3-digit even numbers can be formed from the digits 1, 2, 3, 4, 5  if the digits can be repeated?

3. Find the angle in radian through which a pendulum swings if its length is 75 cm and the tip describes an arc of length 10 cm.

4. Convert 12 radians into degree measure.

5. Find the values of other 5 trigonometric functions if cot x = -5/12, x lies in second quadrant.

6  Solve the inequality for x  : $\frac{(2x-1)}{3} \geq \frac{(3x-2)}{4} - \frac{(2-x)}{5}$

7  Find all pairs of consecutive even positive integers, both of which are larger than 8, such that their Sum is less than 25.

8In how many ways a committee consisting of 3 men and 2 women, can be chosen from 7 men and 5 women?

9 Given 4 flags of different colours, how many different signals can be generated, if a signal requires the use of 2 flags one below the other?

10How many different words can be formed with the letter of the word HARYANA ? How many of these begin with H and end with N?

11 The longest side of a triangle is 3 times the shortest side and the third side is 2 cm shorter than the longest side. If the perimeter of the triangle is at least 61 cm, find the minimum length of the shortest side

12, Solve for x : $-\frac{5}{2} + 2x \le \frac{4x}{3} \le \frac{4}{3} + 2x$ , x € Z, also graph of solution set on number line.

13 Sin x + sin 3x+ sin 5x+sin 7x = 4 cosxcos2xsin4x

14 Find the value of:
a) Sin 1020°
b) Tan (-945)°

15 Find the value of $sin\frac{x}{2}$, $cos\frac{x}{2}$, $tan\frac{x}{2}$ if $cosx = -\frac{3}{5}$ and x lies in III quadrant

16  Case study question

One evening, four friends decided to play a card game. Card game is played with deck of 52 playing cards. In 52 cards, 4 type of cards (suits) that is spade, club, heart and diamond. Spade and club Cards of black colour while heart and diamond of red colour. the card rank low to high starting with Ace, 2,3,4…….. 10, jack, queen and king. Jack, queen, and king are face cards.

Above these information, solve the following questions.

What is the number of ways of choosing 4 cards from 52 playing cards? In how many of these: ( i) 4 cards are of the same unit ( ii ) 2 are red cards and 2 are black cards