Biology holiday homework class 11th.

1.Solve the worksheet provided and paste it in the classwork notebook.

2.Prepare a chart paper on either of topics

Mitosis in cells

Meiosis in cells

Cell organelles.

केंद्रीय विद्यालय संगठन, अहमदाबाद संभाग
KENDRIYA VIDYALAYA SANGATHAN, AHMEDABAD REGION
अर्धवार्षिक परीक्षा 2022-23
HALF YEARLY EXAMINATION 2022-23

SUBJECT: CHEMISTRY   **M.M.: 70**

CLASS: XI   **TIME: 3 Hours**

GENERAL INSTRUCTIONS:

1. There are **35** questions in this question paper with internal choice.

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

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

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

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

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

7. **All questions are compulsory.**

8. **Use of log tables and calculators is not allowed**

SECTION-A

1	Hydrocarbon 'X' contains 92.30% carbon and 7.7% hydrogen. The combustion of one mole of hydrocarbon 'X' takes place at 298 K and 1 atm. After combustion, $CO_2(g)$ and H_2O (l) are produced and 3267.0 kJ of heat is liberated. Calculate the standard enthalpy of formation, $\Delta_f H^0$ of hydrocarbon 'X'. Standard enthalpies of formation of $CO_2(g)$ and $H_2O(l)$ are −393.5 kJ mol^{-1} and − 285.83 kJ mol^{-1} respectively. Molar mass of hydrocarbon 'X' is 78 g/mol	1

  A   -485.1 KJ/mol

  B   485.1 KJ/mol

  C   48.51 KJ/mol

  D   -48.51 KJ/mol

2	Rohan, Kishore, Soumya and Bhavin were individually preparing standard 0.5 Molar (250 ml) aqueous solution of sodium carbonate. They were given anhydrous Sodium carbonate sample, distilled water standard 250 ml volumetric flask, pipette, analytical balance, watch glass, spatula, wash bottle and a beaker of 250 ml. Weight of sodium carbonate measured by each student are as follows-	1

Student	Mass of sodium carbonate (g)
Rohan	13.25
Kishore	1.325
Soumya	0.1325
Bhavin	13.0

Considering the above data who measured the correct weight to prepare the solution?

A   Kishore

B   Soumya

C   Rohan

D   Bhavin

3   Identify the correctly matched pair-   1

   A $AlCl_3$ – Tetrahedral

   B NH_3 - Pyramidal

   C ClF_3 – Trigonal Planner

   D XeF_4 – See-saw

4   Which of the following is the correct ground state electronic configuration of the element   1
     with atomic number of 29?
     A $4s^2 3d^8$

     B $4s^2 3d^1$

     C $4s^1 3d^{10}$

     D $4s^0 3d^{10}$

5   Correct IUPAC name and position of element with Z= 117 in the periodic table is-   1

   A   Ununheptium, Group- 17, Period- 7

   B   UnUnSeptium, Group- 16, Period- 7

   C   UnUnHeptium, Group- 16, Period- 7

   D   Ununseptium, Group- 17, Period- 7

6   For the following equilibrium, Kc = 5.0×10^{14} at 950 K   1
     $NO_{(g)} + O_{3\,(g)} \rightleftharpoons NO_{2\,(g)} + O_{2\,(g)}$
     Both the forward and reverse reactions in the equilibrium are elementary bimolecular
     reactions. What is Kc, for the reverse reaction?
     A 2.0×10^{-14}

     B 2.0×10^{-13}

     C 2.0×10^{-15}

     D 2.0×10^{13}

7   What is the correct value of principle and azimuthal quantum number for 3d orbital?   1

   A   n=3, l= 1

   B   n=2, l= 1

   C   n=3, l= 2

   D   n=3, l= 3

8   How many atoms are present in 880 u of carbon dioxide?   1

    A   60

    B   60N_A

    C   20

    D   20N_A

9   The correct order of negative electron gain enthalpy of halogens is-   1

    A   Cl>Br>F>I

    B   F>Cl>Br>I

    C   Cl>F>Br>I

    D   F>Br>Cl>I

10 The enthalpies of all elements in their standard states are: 1

    A   Unity

    B   Zero

    C   Different for each element

    D   <0

11 According to MOT which among the following molecule will has only pi-bond character-   1

    A N_2

    B O_2

    C C_2

    D   None of the above

12 For the reaction, 2 Cl(g) → Cl_2(g), what are the signs of ΔH and ΔS ?   1

    A   Both negative

    B   Both positive

    C   ΔH = -ve & ΔS = +ve

    D   ΔH = +ve & ΔS = -ve

13 Electron in H- atom jumps from n=6 to n=2 energy level. The wave length of the 1
    emitted radiation will be observed in which region of the electromagnetic spectrum?
    A   Ultra-violet region

    B   Visible region

    C   Infra-red region

    D   Micro-wave region

14 Which among the following statement is incorrect in respect of physical equilibrium-   1

    A   Equilibrium is possible only in a closed system at a given temperature.

    B   Both the opposing processes occur at the same rate and there is a dynamic but stable condition.

    C   All measurable properties of the system changes during equilibrium.

    D   When equilibrium is attained for a physical process, it is characterised by constant value of one of its parameters at a given temperature.

Questions from 15 to 18 have two statements labelled as Assertion (A) and Reason (R). For these questions select the most appropriate answer from the options given below-

    A   Both A and R are true and R is the correct explanation of A.

    B   Both A and R are true but R is not the correct explanation of A.

    C   A is true but R is false.

    D   A is false but R is true.

15 **Assertion (A)**- NF_3 has higher dipole moment than NH_3.   1
    Reason (R)- In NF_3 bond moment is towards fluorine whereas in NH_3 it is towards nitrogen.

16 **Assertion (A)**- Sodium has very high second ionization enthalpy.   1
    Reason (R)- After removal of one electron Na^+ achieve noble gas configuration.

17 **Assertion (A)**- The entropy of any pure crystalline substance approaches zero as the temperature approaches absolute zero.   1
    Reason (R)- Standard entropy of formation of elemental substances is zero.

18 **Assertion (A)**- Reaction $Fe^{3+}_{(aq)}+3OH^-_{(aq)} \rightleftharpoons Fe(OH)_{3(s)}$; is a heterogeneous equilibrium.   1
    Reason (R)- In a heterogeneous equilibrium physical states of reactants and products are different.

SECTION-B

19 Determine the wavelength of a ball of mass 100 g moving with a velocity of 100 Km/s ?   2

20 (a) State Modern Periodic Law.   2

    (b) Write general electronic configuration of d & f- Block elements.

OR

    (a) Why Lithium show difference in the properties from other elements of the group?   2

    (b) Arrange first ionization enthalpy of group 13 elements in the increasing order.

21 (a) State first law of thermodynamics and write its mathematical expression.   2

    (b) In a process, 701 J of heat is absorbed by a system and 394 J of work is done by the system. What is the change in internal energy for the process?

OR

    (a) State second law of thermodynamics.   2

    (b) Given
        $N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}$; $\Delta_rH^0 = -92.4$ kJ mol^{-1}.

What is the standard enthalpy of formation of NH_3 gas?

22 (a) Explain Zeeman effect and Stark effect.   2

    (b) Show that the circumference of the Bohr orbit for the hydrogen atom is an integral multiple of the de Broglie wavelength associated with the electron revolving around the orbit.

23 (a) How electron gain enthalpy and electronegativity are different from each other? Mention any two points.   2

    (b) 'A cation is always smaller than neutral atom whereas anion is larger than neutral atom.' Justify the statement.

24 State Law of constant proportions and Avogadro law.   2

25 (a) State Heisenberg's uncertainty principle, write its mathematical expression.   2

    (b) What is the lowest value of n that allows g orbitals to exist?

SECTION-C

26 (a) How molality and molarity of solution are different from each other? (Write any two points)   3

    (b) Determine mole fraction of solute and solvent in 1 m aqueous solution.

27 (a) Derive relation between K_p and K_c.   3

    (b) The value of Kc for the reaction $2A \rightleftharpoons B + C$ is 2×10^{-3}. At a given time, the composition of reaction mixture is $[A] = [B] = [C] = 3 \times 10^{-4}$ M. In which direction the reaction will proceed?

28 (a) Define isolated and closed system.   3

    (b) 'Ratio of two extensive properties is an intensive property'. Justify the statement with suitable example.

    (c) Calculate the entropy change in surroundings when 1.00 mol of $H_2O(l)$ is formed under standard conditions. $\Delta_f H^0 = -286$ kJ mol^{-1}.

29 50.0 kg of N_2 (g) and 10.0 kg of H_2 (g) are mixed to produce NH_3 (g). Calculate the volume of NH_3 (g) formed at STP. Identify the limiting reagent in the production of NH_3 in this situation. Determine mass of the excess reagent left unreacted.   3

30 From the modern periodic table answer the following questions.   3

    (a) Identify an element with five electrons in the outer subshell.

    (b) Identify an element that would tend to lose two electrons.

    (c) Identify the element with smallest atomic size.

    (d) Identify the group having metal, non-metal, liquid as well as gas at the room temperature.

    (e) Identify the element with highest first ionization enthalpy.

    (f) Identify an element that would tend to gain two electrons.

OR

Predict the formulas of the stable binary compounds that would be formed by the combination of the following pairs of elements. (a) Lithium and oxygen (b) Magnesium   3

and nitrogen (c) Aluminium and iodine (d) Silicon and oxygen (e) Phosphorus and fluorine (f) Element 71 and fluorine

SECTION-D (CASE BASED)

Question number 31& 32 are case based questions and carries 4 (1+1+2) marks each. For this read the paragraph carefully and answer the questions.

31 Kössel and Lewis in 1916 developed an important theory of chemical combination between atoms known as electronic theory of chemical bonding. According to this, atoms can combine either by transfer of valence electrons from one atom to another (gaining or losing) or by sharing of valence electrons in order to have an octet in their valence shells. This is known as octet rule.

Langmuir (1919) refined the Lewis postulations by abandoning the idea of the stationary cubical arrangement of the octet, and by introducing the term covalent bond. The Lewis dot structures provide a picture of bonding in molecules and ions in terms of the shared pairs of electrons and the octet rule. While such a picture may not explain the bonding and behaviour of a molecule completely, it does help in understanding the formation and properties of a molecule to a large extent. Writing of Lewis dot structures of molecules is, therefore, very useful.

(a) Write Lewis dot structure of CO and acetate ion.   1

(b) Write two compounds with odd electrons which do not follow octet rule.   1

(c) Write Lewis dot structure of nitrite ion and determine formal charge of nitrogen in it.   2

OR

(c) Write Lewis dot structure of ozone molecule and determine formal charge of central oxygen in it.   2

32 One of the principal goals of chemical synthesis is to maximise the conversion of the reactants to products while minimizing the expenditure of energy. This implies maximum yield of products at mild temperature and pressure conditions. If it does not happen, then the experimental conditions need to be adjusted. For example, in the Haber process for the synthesis of ammonia from N_2 and H_2, the choice of experimental conditions is of real economic importance. Annual world production of ammonia is about hundred million tones, primarily for use as fertilizers. Equilibrium constant, K_c is independent of initial concentrations. But if a system at equilibrium is subjected to a change in the concentration of one or more of the reacting substances, then the system is no longer at equilibrium; and net reaction takes place in some direction until the system returns to equilibrium once again. Similarly, a change in temperature or pressure of the system may also alter the equilibrium. In order to decide what course the reaction adopts and make a qualitative prediction about the effect of a change in conditions on equilibrium we use Le Chatelier's principle.

(a) How the following reactions will get affected by increasing the pressure?   1
(i) $COCl_2 \text{ (g)} \rightleftharpoons CO \text{ (g)} + Cl_2 \text{ (g)}$
(ii) $CH_4 \text{ (g)} + 2S_2 \text{ (g)} \rightleftharpoons CS_2 \text{ (g)} + 2H_2 S \text{ (g)}$

(b) State Le Chatelier's principle.   1

(c) Mention the conditions which favours higher yield of product in the following reaction-   2
$PCl_5 \text{ (g)} \rightleftharpoons PCl_3 \text{ (g)} + Cl_2 \text{ (g)}$; $\Delta_r H^0 = 124.0 \text{ kJ mol}^{-1}$

OR

(c) Dihydrogen gas is obtained from natural gas by partial oxidation with steam as per following endothermic reaction: $CH_{4\,(g)} + H_2O_{(g)} \rightleftharpoons CO_{(g)} + 3H_{2\,(g)}$ 2
How will the values of K_p and composition of equilibrium mixture be affected by
(i) increasing the pressure (ii) increasing the temperature

SECTION-E

33 (a) Derive relation between c_p and c_v.   5

(b) Determine the work is done during free expansion of an ideal gas.

(c) Calculate the number of kJ of heat necessary to raise the temperature of 60.0 g of aluminium from 35°C to 55°C. Molar heat capacity of Al is 24 J mol^{-1} K^{-1}.

OR

(a) Using the relationship $\Delta S_{total} = \Delta S_{sys} + \Delta S_{surr}$ Derive the following relationship –   5
$T\Delta S_{total} = - \Delta G_{system}$

(b) For the reaction 2 A(g) + B(g) → 2D(g) $\Delta U^0 = -10.5$ kJ and $\Delta S^0 = -44.1$ JK^{-1}.
Calculate ΔG^0 for the reaction, and predict whether the reaction may occur spontaneously. (R = 8.314 Jmol^{-1}K^{-1})

34 (a) Using MOT determine bond order and magnetic nature of superoxide and peroxide ion. Also compare their stability.   5

(b) Out of SO_2 and CO_2, which molecule will have net dipole moment and why?

(c) Write resonating structures of acetate ion.

OR

(a) On the basis of MOT explain about existence of Be$_2$ molecule.   5

(b) Draw Molecular Orbital Diagram of O_2 and determine its bond order.

(c) Write resonating structures of carbonate ion.

(d) On the VSEPR justify that all bonds in PCl$_5$ are not equal.

35 (a) State Pauli's Exclusion Principle and Hund's Rule.   5

(b) Using s, p, d notations, describe the orbital with the following quantum numbers.
(i) n=1, l=0; (ii) n = 3; l=1 (iii) n = 4; l =2; (iv) n=4; l=3.

(c) Draw shape of the following orbital- (i) d_z^2 (ii) d_{xz}

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Class - XIA

1) Sets

2) Relation and Function

3) Trigonometric Functions

4) Binomial Function

5) Permutation and combination

6) Conic sections

Explain the topic along with required information , Solve sums and write its applications in day to day life

SUBJECT: CHEMISTRY   **M.M.: 70**
CLASS: XI   **TIME: 3 Hours**
GENERAL INSTRUCTIONS:

1. There are **35** questions in this question paper with internal choice.
2. SECTION A consists of 18 multiple-choice questions carrying 1 mark each.
3. SECTION B consists of 7 very short answer questions carrying 2 marks each.
4. SECTION C consists of 5 short answer questions carrying 3 marks each.
5. SECTION D consists of 2 case- based questions carrying 4 marks each.
6. SECTION E consists of 3 long answer questions carrying 5 marks each.
7. **All questions are compulsory.**
8. **Use of log tables and calculators is not allowed**

SECTION-A

1   The total number of ions present in 111 g of $CaCl_2$ is   1

    A   One Mole

    B   Two Mole

    C   Three Mole

    D   Four Mole

2   An organic compound contains carbon, hydrogen and oxygen. Its elemental   1
analysis gave C=38.71% and H=9.67%. The empirical formula of the
compound would be

    A   CHO

    B CH_4O

    C CH_4O

    D CH_2O

3   The magnetic quantum number specifies   1

    A   Size of orbitals

    B   Shape of orbitals

    C   Orientation of orbitals

    D   Nuclear Stability

4   Which of the following statements is correct for multi electron species?   1

    A   3s orbital is higher in energy than 3p orbital

    B   4s orbital is lower in energy than 3d orbital

    C   3s and 3p orbitals are similar in energy

    D   3s, 3p and 3d orbitals all have the same energy

5   Which one of the following sets of ions represents isoelectronic species?   1

    A K^+, Ca^{2+}, Sc^{3+}, Cl^-

    B Na^+, Ca^{2+}, Sc^{3+}, F^-

    C K^+, Cl^-, Mg^{2+}, Sc^{3+}

    D Na^+, Mg^{2+}, Al^{3+}, Cl^-

6   The element with atomic number 35 belongs to   1

    A   d – Block

    B   s – Block

    C   p – Block

    D   f – Block

7   The correct order of first ionization enthalpy among the following elements -   1
    Be, B, C, N and O is
    A   B < Be < C < O < N

    B   B < Be < C < N < O

    C   Be < B < C < N < O

    D   Be < B < C < O < N

8   Which of the following is a linear molecule?   1

    A ClO_2

    B CO_2

    C NO_2

    D SO_2

9   The Hybridisation of central atom in SF_4 1

    A Sp^3

    B Sp^3d

    C Sp^3d^2

    D Sp^2

10 The enthalpy of vaporisation of a substance is 8400 J mol^{-1} and its boiling   1

point is –173°C. The entropy change for vaporisation is:

   A   21 J mol^{-1}K^{-1}

   B   84 J mol^{-1}K^{-1}

   C   49 J mol^{-1}K^{-1}

   D   12 J mol^{-1}K^{-1}

11 In a reversible process the system absorbs 600 kJ heat and performs 250 kJ   1
work on the surroundings. What is the increase in the internal energy of the
system?

   A   850 kJ

   B   600 kJ

   C   350 kJ

   D   250 kJ

12 In which of the following process, a maximum increase in entropy is   1
observed?

   A   Dissolution of Salt in Water

   B   Condensation of Water

   C   Sublimation of Naphthalene

   D   Melting of Ice

13 Which of the following is not a general characteristic of equilibria involving   1
physical processes?

   A   Equilibrium is possible only in a closed system at a given temperature.

   B   All measurable properties of the system remain constant.

   C   All the physical processes stop at equilibrium.

   D   The opposing processes occur at the same rate and there is dynamic
but stable condition.

14 In a reversible chemical reaction at equilibrium, if the concentration of any   1
one of the reactants is doubled, then the equilibrium constant will

   A   Also, be Doubled

   B   Be Halved

   C   Remain the Same

   D   Become One-Fourth

Q.No. 15-18 Given below are two statements labelled as Assertion (A) and Reason (R) Select the most appropriate answer from the options given below:

    A   Both A and R are true and R is the correct explanation of A.

    B   Both A and R are true but R is not the correct explanation of A.

    C   A is true but R is false.

    D   A is false but R is true.

15   **Assertion (A):** Electron gain enthalpy does not always become less negative as we go down a group in Modern periodic table.   1
Reason (R): Size of the atom increases on going down the group in Modern periodic table and added electron would be farther from the nucleus.

16   **Assertion (A):** Though the central atom of both NH_3 and H_2O molecules are sp^3 hybridised, yet H–N–H bond angle is greater than that of H–O–H.   1
Reason (R): This is because nitrogen atom in NH_3 has one lone pair and oxygen atom in H_2O has two lone pairs.

17   **Assertion (A):** Entropy of system increases for a spontaneous reaction.   1

    Reason (R): Enthalpy of reaction always increases for spontaneous reaction.

18   **Assertion (A):** As pressure increases the dissociation of PCl_5 into PCl_3 and Cl_2 increases.   1
Reason (R): An equilibrium is subjected to change in pressure, it will shift in that direction to undo the effect of change.

SECTION – B

19   Define molarity. How is it affected by a change in temperature?   2

20   Write the name and symbol of element which are indicated by the following electronic configurations: 2
(a) $1s^2, 2s^2, 2p^6, 3s^2, 3p^5$. (b) $[Ar]\ 4s^1, 3d^{10}$

OR

Write the electronic configuration of : (a) Cr   (b) Fe^{3+} 2

21   Calculate (a) wavenumber and (b) frequency of yellow radiation having wavelength 5800 Å.   2

OR

A 100 watt bulb emits monochromatic light of wavelength 400 nm. Calculate the number of photons emitted per second by the bulb.   2

22   Define the following: -   2

          (a)   Pauli Exclusion Principle   (b) Hund's Rule of Maximum Multiplicity

23   Using the Periodic Table, predict the formulas of compounds which might be   2
      formed by the following pairs of elements; (a) silicon and bromine (b)
      aluminium and sulphur

24   Show by a chemical reaction with water that Na_2O is a basic oxide and Cl_2O_7 2
      is an acidic oxide.

25   If water vapour is assumed to be a perfect gas, molar enthalpy change for   2
      vapourisation of 1 mol of water at 1bar and 100°C is 41kJ mol^{-1}. Calculate
      the internal energy change, when1 mol of water is vapourised at 1 bar
      pressure and 100°C.

SECTION - C

26   A compound contains 4.07% hydrogen, 24.27% carbon and 71.65%   3
      chlorine. Its molar mass is 98.96 g. What are its empirical and molecular
      formulas?

27   (a)   Define molarity.   3

      (b)   The density of 3 M solution of NaCl is 1.25 g mL^{-1}. Calculate the
            molality of the solution.

28   (a)   Define modern periodic law.   3

      (b)   Which of the following pairs of elements would have a more negative
            electron gain enthalpy and why? F or Cl

      (c)   Would you expect the second electron gain enthalpy of O as positive,
            more negative or less negative than the first? Justify your answer.

29   The combustion of one mole of benzene takes place at 298 K and 1 atm.   3
      After combustion, $CO_2(g)$ and H_2O (l) are produced and 3267.0 kJ of heat is
      liberated. Calculate the standard enthalpy of formation, ΔH_f^0 of benzene.
      Standard enthalpies of formation of $CO_2(g)$ and $H_2O(l)$ are −393.5 kJ mol^{-1}
      and − 285.83 kJ mol^{-1} respectively.

30   (a)   Define law of mass action.   3

      (b)   Write the expression for the equilibrium constant, Kc for each of the
            following reactions:
                (i) $2NOCl$ (g)$\rightleftharpoons$ $2NO$ (g) + Cl_2 (g)
                (ii) $2Cu(NO_3)_2$ (s) $\rightleftharpoons$ $2CuO$ (s) + $4NO_2$ (g) + O_2 (g)

OR

(a) Find out the value of Kc for each of the following equilibria from the value of K_p as given below for the reaction: 3

2NOCl (g) $\rightleftharpoons$ 2NO (g) + Cl$_2$ (g); K_p = 1.8×10^{-2} at 500 K

(b) Derive the relationship between K_p and K_c

SECTION – D (CASE BASED)

Question no. 31 and 32 are case-based questions and carries 4 (1+1+2) marks each. Read the passage carefully and answer the questions that follow.

31 **"POLARITY OF BONDS & THE VALENCE SHELL ELECTRON PAIR REPULSION (VSEPR) THEORY"**

In case of a heteronuclear molecule like HF, the shared electron pair between the two atoms gets displaced more towards fluorine since the electronegativity of fluorine is far greater than that of hydrogen. The resultant covalent bond is a polar covalent bond. As a result of polarisation, the molecule possesses the dipole moment (depicted below) which can be defined as the product of the magnitude of the charge and the distance between the centres of positive and negative charge.

The shape of a molecule depends upon the number of valence shell electron pairs (bonded or nonbonded) around the central atom. Pairs of electrons in the valence shell repel one another since their electron clouds are negatively charged. These pairs of electrons tend to occupy such positions in space that minimise repulsion and thus maximise distance between them. The valence shell is taken as a sphere with the electron pairs localising on the spherical surface at maximum distance from one another. The repulsive interaction of electron pairs decreases in the order:

Lone pair (lp) – Lone pair (lp) > Lone pair (lp)– Bond pair (bp) > Bond pair (bp)–Bond pair (bp)

(a) Compare the bond angle of CH$_4$ and NH$_3$ with explanation. 1

(b) What is the shape of ClF$_3$. Also draw the shape. 1

(c) Which out of NH$_3$ and NF$_3$ has higher dipole moment and why? 2

OR

(c) Write the unit of dipole moment and explain why BeH$_2$ molecule has a zero-dipole moment although the Be–H bonds are polar. 2

"Factors affecting equilibria"

32

One of the principal goals of chemical synthesis is to maximise the conversion of the reactants to products while minimizing the expenditure of energy. This implies maximum yield of products at mild temperature and pressure conditions. If it does not happen, then the experimental conditions need to be adjusted. For example, in the Haber process for the synthesis of ammonia from N_2 and H_2, the choice of experimental conditions is of real economic importance. Annual world production of ammonia is about hundred million tones, primarily for use as fertilizers. Equilibrium constant, Kc is independent of initial concentrations. But if a system at equilibrium is subjected to a change in the concentration of one or more of the reacting substances, then the system is no longer at equilibrium; and net reaction takes place in some direction until the system returns to equilibrium once again. Similarly, a change in temperature or pressure of the system may also alter the equilibrium. In order to decide what course, the reaction adopts and make a qualitative prediction about the effect of a change in conditions on equilibrium we use Le Chatelier's principle. It states that a change in any of the factors that determine the equilibrium conditions of a system will cause the system to change in such a manner so as to reduce or to counteract the effect of the change. This is applicable to all physical and chemical equilibria.

(a) What will be the effect on equilibrium if temp is increased in the below given equation?

$2NO_2(g) \rightleftharpoons N_2O_4(g)$; $\Delta H = -57.2$ kJ mol^{-1}

1

(b) What will be the effect on equilibrium if pressure is decreased in the below given equation?

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H = -92.38$ kJ mol^{-1}

1

(c) Describe the effect of : (i) addition of H_2 (ii) removal of CH_3OH on the equilibrium of the reaction: $2H_2(g) + CO \rightleftharpoons (g) CH_3OH (g)$

2

OR

(c) What will be the effect on equilibrium if inert gas is added at (i) Constant Pressure (ii) Constant Volume for the given equation:

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H = -92.38$ kJ mol^{-1}

2

SECTION – E

33 (a) Write the postulates of Bohr's modal of an atom.(Any two)   2

   (b) Calculate the energy associated with the first orbit of He^+. What is the   2
       radius of this orbit?

   (c) Find out the number of angular nodes in 3d orbital   1

OR

   (a) Define Heisenberg's Uncertainty Principle and write its Significance   2

   (b) A golf ball has a mass of 40g and a speed of 45 m/s. If the speed can   2
       be measured within accuracy of 2%, calculate the uncertainty in the
       position.

   (c) Write the values of all four quantum numbers for $4dz^2$ orbital   1

34 (a) Briefly explain molecular orbital theory   2

   (b) Explain the magnetic behaviour of O_2 by MOT. Also draw energy level   3
       diagram and calculate bond order in O_2

OR

   (a) Define hybridisation and write the Important conditions for   2
       hybridisation.

   (b) Find out the hybridisation and shape of the following molecules   3
       (i) $BeCl_2$ (ii) BF_3 (iii) H_2O

35 (a) Define Third law of thermodynamics.   1

   (b) Calculate the standard enthalpy of formation of $CH_3OH(l)$ from the   2
       following data:
       (i) $CH_3OH (l) + 3/2\ O_2(g) \rightarrow CO_2 (g) + 2H_2O(l)$; $\Delta H_r^0 = -726$ kJ mol^{-1}
       (ii) $C(graphite) + O_2(g) \rightarrow CO_2(g)$; $\Delta H_c^0 = -393$ kJ mol^{-1}
       (iii) $H_2(g) + 1/2\ O_2(g) \rightarrow H_2O(l)$; $\Delta H_f^0 = -286$ kJ mol^{-1}.

   (c) For the reaction 2 A(g) + B(g) → 2D(g) $\Delta U^0 = -10.5$ kJ and $\Delta S^0 = -$ 2
       44.1 JK^{-1}. Calculate ΔG^0 for the reaction, and predict whether the
       reaction may occur spontaneously.(R=8.314 J/mol K)

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KENDRIYA VIDYALAYA SILVASSA

SUBJECT:- ENGLISH

STD :- XI

AUTUMN BREAK HOLIDAY HOME WORK (2023-24)

Q.1 Make poster given below topics.

1. Design a poster as an appeal for conserving water as most parts of India are facing serious problems and have been hit by drought.

2 .Your school is celebrating Science week. Prepare a poster to create awareness regarding the importance of science in our daily lives.

2. Cut out 2 clippings of Classified Ads under the heads- given below.

☐ For sale

☐ To-let

☐ Situation vacant

☐ For matrimonial

☐ Pets/kennels

2. As Mukul / Mahima of Alps Public School, write **a speech** to be delivered in school assembly highlighting the importance of cleanliness suggesting that the state of cleanliness reflects the character of its citizens. (150-200 words)

3. Note Making Example 2: Read the passage given below: (Sample Question Paper CBSE, 2017-18)

1. Colour Therapy is a complementary therapy for which there is evidence dating back thousands of years to the ancient cultures of Egypt, China and India. If we define it in simple terms, Colour is a light of varying wavelengths, thus each colour has its own particular wavelength and energy.**2**. Colours contribute to energy. This energy may be motivational and encouraging. Each of the seven colours of the spectrum are associated with energy. The energy relating to each of the seven spectrum colours of red, orange, yellow, green, blue, indigo and violet, resonates with the energy of each of the seven main chakras/energy centres of the body. Colour therapy can help to re-balance and/or stimulate these energies by applying the appropriate colour to the body.**3**. Red relates to the base chakra, orange the sacral chakra, yellow the solar plexus chakra, green the heart chakra, blue the throat chakra, indigo the brow chakra (sometimes referred to as the third eye) and violet relates to the crown chakra.**4**. Colour is absorbed by the eyes, skin, skull, our 'magnetic energy field' or aura and the energy of colour affects us on all levels, that is to say, physical, spiritual and emotional. Every cell in the body needs light energy – thus colour energy has widespread effects on the whole body. There are many different ways of giving colour, including; Solarised Water, Light boxes/lamps with colour filters, colour silks and hands on healing using colour.**5**. Colour therapy can be shown to help on a physical level, which is perhaps easier to quantify, however there are deeper issues around the colours on the psychological and spiritual levels. Our wellbeing is not, of course, purely a physical issue. Fortunately, many more practitioners,

both orthodox and complementary, are now treating patients in a holistic manner.**6**. Colour Therapy is a totally holistic and non-invasive therapy and, really, colour should be a part of our everyday life, not just something we experience for an hour or two with a therapist. Colour is all around us everywhere. This wonderful planet does not contain all the beautiful colours of the rainbow for no reason. Nothing on this earth is here just by chance; everything in nature is here for a purpose. Colour is no exception. All we need to do is to heighten our awareness of the energy of colour, absorb it and see how it can transform our lives.

4. Read the chapter ' Mothers day ' given in(Snapshots book) and write summary short in your note book .

KENDRIYA VIDYALAYA SILVASSA
CLASS – XI [Session 2023-24]
SUBJECT – COMPUTER SCIENCE
HOLIDAY HOMEWORK (AUTUMN BREAK)

Computer system and organization:

1) Define computer.
2) How does an ALU work?
3) Briefly explain the working of a control unit.
4) Define hardware and software.
5) What is an operating system? Explain types of OS.
6) Specify the measuring units of memory.
7) Differentiate between RAM and ROM.
8) Name any 4 input devices and output devices.
9) Differentiate between Interpreter and compiler.
10) List the differences between a CD and A DVD.
11) List and briefly explain all the components of a CPU.
12) Compare data and information.
13) Compare volatile memory and nonvolatile memory.
14) Discuss the classification of digital computers.

Binary number system

1) Convert $(38.625)_{10}$ to its binary equivalent.
2) Convert $(1101)_2$ to its decimal number.
3) Convert $(EF.B1)_{16}$ to its decimal equivalent.
4) Convert $(2C9)_{16}$ into decimal
5) Convert $(423)_{10}$ into hexadecimal
6) Convert $(ABCD)_{16}$ TO $(....)_2$
7) Perform the following:

Boolean Algebra

1) Draw a truth table and circuit diagram of NAND gate.
2) What is truth table?
3) What is logic gates?
4) Verify the following using truth table.
   X+Y.Z = (X+Y)(X+Z)
5) Draw a logic circuit diagram for the following:
   a. (A+B)(B+C)
   b. (A.B')+(C+D')+(B.D')
   c. (A+B).(BC+D')
6) Obtain the Boolean Expression for the following circuit shown below:
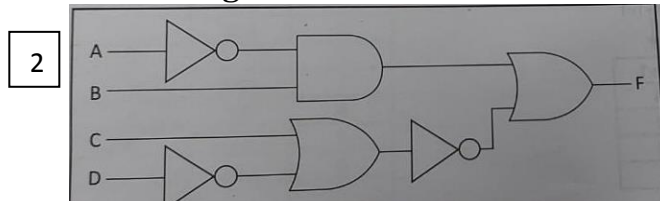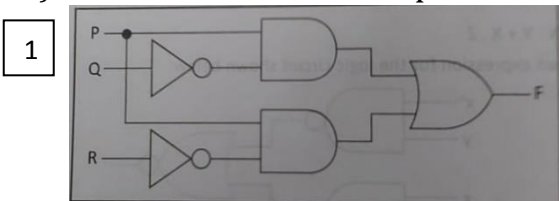
7) State De-Morgan's law and prove it using Truth table.
8) Write the name of the following law and prove using Truth table. a(b+c) = ab+ac

Features of Python

1) What is python?
2) Why is python interpreted?
3) Who developed python?
4) What is IDLE?
5) Write features of python.
6) In how many modes python IDLE works?
7) Python is a free and open source language. What do you understand by this feature?
8) What is pseudo code? What is flow chart?
9) Write a pseudo code to calculate area and perimeter of rectangle.
10) Differentiate between Interactive mode and scripting mode.

Python Fundamentals:

1) Define Token. Name different types of it.
2) Differentiate between Keyword and Identifiers.
3) Write Identifier forming rules.
4) What is variable. What are the different components of a variable.
5) Is python case sensitive? What is meant by the term 'case-sensitive' in programming language.
6) Differentiate between mutable and immutable object.
7) Ritu is confused between 3*2 and 3**2. Help her to know the difference between the two expressions.
8) How many types of string are supported in python?
9) Differentiate between explicit and implicit type conversion.
10) What is None in python?
11) Identify the types of the following literals:
    23.789, 23789 , True, {4:'four', 5:'five'}, 'True', (1,2,3), None, [100,200,300]
12) Find the output generated by the following:

(1) x=2	(2) x=8
y=3	y=2
x+=y	x+=y
print(x,y)	y-=x
	print(x,y)
3) a=5	4) p=10
b=10	q=20
a+=a+b	p*=q//3
b*=a+b	q+=p+q**2
print(a,b)	print(p,q)

13) differentiate between Expression and statement in python?
14) Write the output of the following:
    x,y=2,6
    x,y=y,x+2
    print(x,y)
15) What output will be produced by the following code:
    A,B,C,D = 9.2,2.0,4,21
    print(A/4)
    print(A//4)
    print(B**C)
    print(A%C)

16)   Evaluate the following expression:
   a. (2+3)**3-6/2
   b. 12*3%5+2*6/4
17) Identify the invalid variable names from the following giving reason for each:
   Group, if, total marks, S.I. , volume, tot_strength, #tag, tag$, 9a,for
18)   Write python expression equivalent to the following:

   a. $A = P\left(1 + \frac{r}{n}\right)^{nt}$ b. $\sqrt{a} + \frac{a+2}{b}$

1) What are operators? Give some examples of unary and binary operators.
2)   Write a code to calculate area of triangle. Accept input from the user.
3)   Write a python code to accept radius of a circle nad print its area.
4) Write a python program that accepts marks in 5 subjects and outputs average marks.
5)   Write a code to find area and perimeter of rectangle.
6)   Write a code to find Simple Interest and Compound interest.
7)   Write a code accept temperature in Celcius and covert it into Fahrenheit.

String

| 10 | Find and write the output of the following python code:

```python
def fun(s):
        k=len(s)
        m=" "
        for i in range(0,k):
            if(s[i].isupper()):
                    m=m+s[i].lower()
            elif s[i].isalpha():
                    m=m+s[i].upper()
            else:
                m=m+'bb'
        print(m)

fun('school2@com')
``` | 2 |

List Manipulation

| 1 | Consider the following list myList. What will bethe elements of myList after the following twooperations:
myList = [10,20,30,40]
i. myList.append([50,60])
ii. myList.extend([80,90]) | 3 |
| 2 | What will be the output of the following code segment:
myList = [1,2,3,4,5,6,7,8,9,10]
for i in range(0,len(myList)): if i%2 == 0:
print(myList[i]) | 2 |

3	What will be the output of the following codesegment: a. myList = [1,2,3,4,5,6,7,8,9,10] del myList[3:] print(myList) b. myList = [1,2,3,4,5,6,7,8,9,10]	4
4	Write a program to print largest element of a given list.	3
5	The record of a student (Name, Roll No., Marks in five subjects and percentage ofmarks) is stored in the following list: stRecord = ['Raman','A-36',[56,98,99,72,69],78.8] Write Python statements to retrieve the following information from the list stRecord. a) Percentage of the student b) Marks in the fifth subject c) Maximum marks of the student d) Roll no. of the student e) Change the name of the student from'Raman' to 'Raghav'.	5
| 6 | What possible outputs(s) are expected to be displayed on screen at the time of execution of the program from the following code? Also specify the maximum values that can be assigned to each of the variables BEGIN and END.<br><br>```python
import random
PICKER=random.randint(0,3)
COLORS=["BLUE","PINK","GREEN","RED"]
for I in COLORS:
        for J in range(1,PICKER):
                print(I,end="")
        print()
```<br><br>| (i)<br>BLUE<br>PINK<br>GREEN<br>RED | (ii)<br>BLUE<br>BLUEPINK<br>BLUEPINKGREEN<br>BLUEPINKGREENRED |<br>\|---\|---\|<br>| (iii)<br>PINK<br>PINKGREEN<br>PINKGREENRED | (iv)<br>BLUEBLUE<br>PINKPINK<br>GREENGREEN<br>REDRED | | 2 |

```
del
myList[:5]
print(myList
)
c. myList = [1,2,3,4,5,6,7,8,9,10]
del
myList[::2]
print(myList
)
```

7	Consider the lists L1=[1,2,3] and L2=[5,6,7]. What will be output of thefollowing-
	
	    (1) L1*2 (2) L1+L2
	
	OR
	
	Consider a list L=[10,12,14,20,22,24,30,32,34], find the output of the following-
	
	    (1) L[0: 10 : 2] (2) L[: : 3]
		2

8	Discuss the following functions of Dictionary with suitable example: (a) pop() (b) popitem() (c) items()	

9	Consider the following program.
	<pre>import random
	AR= [10,20,30,40,50,60,70];
	START = random.randint(1,3) END=
	random.randint(2,4)
	for k in range(START, END+1):
	          print(AR[k], end = "#")</pre>(a) What possible output(s) are expected to be displayed on screenwhen above program is executed?
	    (i) 10#20#30#
	    (ii) 30#40#50#
	    (iii) 50#60#70#(iv)
	    20#30#40#
	(b) Specify the maximum values that can be assigned to START andEND variable.
	(c) What is difference between random() and randint() function.	

10	Write a program to read a list of numbers and create another list whichstore half of each even number and double of each odd number in the list. Example: if list is containing [3,5,6,2,7,4,5,8] then new list should contain [6,10,3,1,14,2,10,4]	

	Sohan has made a list **sohan_list**. He executes the following pythonstatements. Predict the output of the code as per the sohan's list.
	
	    sohan_list=['p','r','o','b','l','e','m']
	    sohan_list[2:3]=[] print(sohan_list)
	    sohan_list[2:5]=[] print(sohan_list)
	    print(sohan_list[::-1])
	
	                OR
	Write a program to delete the item from a list by its value(value should be entered by user)	

11	1. Consider a list L = [53, 89, 12, 78, 45] and answer the following questions:
	    i. Write a statement to add the value 96 in L so that the L becomes [53, 89, 12, 78, 96, 45]
	    ii. What will happen if the following statement is executed?
	      print(L.pop())
	    iii. Write a statement to arrange the elements of L in the descending order of values i.e. L is [89, 78, 53, 45, 12]
	    iv. What is the content of Lx if Lx = L[2:]+L[:3]*2, where L isthe initial original list given in the question ?	

Tuple

| 1 | Consider the following tuples, tuple1 and tuple2:
tuple1 = (23,1,45,67,45,9,55,45)
tuple2 = (100,200)
Find the output of the following statements:
    i. print(tuple1.index(45))
    ii. print(tuple1.count(45))
    iii. print(tuple1 + tuple2)
    iv. print(len(tuple2))
    v. print(max(tuple1))
    vi.print(min(tuple1))
    vii. print(sum(tuple2))
    viii. print(sorted(tuple)
        print(tuple1) | 4 |

| 2 | Look the following statements (a) and (b) carefully and state difference between the two statements.

      (a) t1=(a)
(b) t2=(a,) | |