CLASS- X

SAINIK SCHOOL KUNJPURA, KARNAL

WINTER VACATION TASK, CLASS X, SUBJECT : ENGLISH

1. Attempt **03 (three)** English sample papers of Class X Board in the Holidays HW copy.
2. Write 2 letters each of the following (Total 8 letters) in Holidays HW copy :-
   a) Letter of enquiry
   b) Letter placing order
   c) Letter of complaint
   d) Editorial letter
3. You are Somesh / Sonali, Sports Captain of Fatima Convent School, Agra. Your school is planning to organize IPSC Boxing Championship in which IPSC schools will be participating. Write an essay in 200 words describing how you would arrange the said competition. Invent all other details. [to be done in Holidays HW copy]
4. **Alternative Ending Project** : Rewrite the ending of a story.
   Examples:
   - What if Griffin was punished earlier?
   - What if Horace Danby didn't get caught?
   - What if Hari Singh didn't run away?

   Present both endings side by side. [Word limit : 180-200, to be done in Holidays HW copy]
5. **Value Education Activity** : Pick 1 story from *First Flight* + 1 from *Footprints Without Feet* that share a theme.
   Examples:
   - **Honesty:** *The Thief's Story + The Hundred Dresses*
   - **Courage:** *Nelson Mandela + The Midnight Visitor*
   - **Compassion:** *A Triumph of Surgery + Animals (poem)*

   Paste images, add quotes, and explain the connection. [Word limit - 200, to be done in Holidays HW copy]
6. **Theme Analysis Project** : Choose any **two chapters** and analyze themes like:
   - Freedom
   - Courage
   - Social discrimination
   - Honesty
   - Human values

   Include quotes, incidents, and your reflections. [Word limit - 200, to be done in Holidays HW copy]
7. To revise all the grammar topics, chapters and poems from both the text books completed in the class for Pre-Board exams to be held after winter vacation.

:-हिन्दी:-

1. कक्षा पुस्तक से सम्बन्धित प्रश्न-पत्र 1,2,3,4 एवम् 5 एक प्रोजेक्ट के रूप में लिखकर लाएँ।

MATHEMATICS

1. Solve 03 (three) Maths sample papers of class X Board in the Holidays HW notebook.

ACTIVITY

1. To show that the formula for the sum of n terms of an Arithmetic progression (A.P.) is given by

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

2. To verify the trigonometry identity

$$\sin^2\theta + \cos^2\theta = 1$$

Solve the following questions

Ex	Q. No.
8.1	4, 5, 6, 8, 9, 10
8.2	1 (ii) (iv) (v), 3
8.3	1, 2, 4 (all parts)
9.1	2, 4, 6, 8, 9, 11, 13, 14, 15
10.2	5, 7, 8, 9, 11, 12, 13
11.1	2, 4, 6, 8, 10, 11, 12, 14
12.1	1, 3, 5, 7, 8, 9
12.2	2, 4, 6, 8
13.1	1, 3, 5, 7, 9
13.2	1, 5, 7
13.3	5, 6, 7
14.1	4, 6, 8, 10, 12, 14, 16, 18

CLASS X – Winter Holidays Home Work: Social Science

1. "Map Work: On an outline map of India, locate the following features chapter-wise."

Chapter: Nationalism in India - Areas to be located/labelled/identified:

A. Congress Sessions: i) 1920 Calcutta ii) 1920 Nagpur iii) 1927 Madras

B. Satyagraha Movements: i) Champaran (Indigo farmers) ii) Kheda (Peasants) iii) Ahmedabad (Mill workers)

C. Other Key Events: i) Jallianwala Bagh ii) Dandi March

Chapter: Resources and Development- Identify major soil types

Chapter: Water Resources- Dams to be located and labelled:

a) Salal b) Bhakra Nangal c) Tehri d) Rana Pratap Sagar e) Sardar Sarovar f) Hirakud g) Nagarjuna Sagar h) Tungabhadra

Chapter: Agriculture - Areas to be identified:

a) Major rice and wheat growing regions b) Largest/major producer states of: Sugarcane, Tea, Coffee, Rubber, Cotton, Jute

Chapter: Minerals and Energy Resources - To be identified:

A) Iron Ore Mines: a) Mayurbhanj b) Durg c) Bailadila d) Bellary e) Kudremukh

B) Coal Mines: a) Raniganjb)Bokaro c) Talcher d) Neyveli

C) Oil Fields: a) Digboi b) Naharkatia c) Mumbai High d) Bassien e) Kalol f) Ankleshwar

D) Thermal Power Plants: a) Namrup b) Singrauli c) Ramagundam

E) Nuclear Power Plants: a) Narora b) Kakrapar c) Tarapur d) Kalpakkam

Chapter: Manufacturing Industries - (Locating and labelling only)

A) Cotton Textile Industries: a) Mumbai b) Indore c) Surat d) Kanpur e) Coimbatore

B) Iron and Steel Plants: a) Durgapur b) Bokaro c) Jamshedpur d) Bhilai e) Vijayanagar f) Salem

C) Software Technology Parks: a) Noida b) Gandhinagar c) Mumbai d) Pune e) Hyderabad f) Bengaluru g) Chennai h) Thiruvananthpuram

Chapter: Lifelines of National Economy - (Locating and labeling only)

A) Major Sea Ports: a) Kandla b) Mumbai c) Marmagao d) New Mangalore e) Kochi f) Tuticorin g) Chennai h) Visakhapatnami)Paradip j) Haldia

B) International Airports: a) Amritsar (Raja Sansi – Sri Guru Ram Das Ji) b) Delhi (Indira Gandhi) c) Mumbai (Chhatrapati Shivaji) d) Chennai (Meenambakkam)e) Kolkata (Netaji Subhash Chandra Bose) f) Hyderabad (Rajiv Gandhi)

2. "Project Activity: Choose one topic and make a project on 12 to 15 A4-size sheets. Add plenty of photographs, maps, and diagrams to make it interesting."

a) From Silk Roads to Shipping Ports: The Evolution of Global Connectivity

b) Colonialism and the Birth of Transport Infrastructure in India

c) Global Goods, Local Routes: Mapping the Journey of Everyday Products

d) Globalization and the Rise of Air Travel: A Historical-Geographical Perspective

e) Maritime Empires and Modern Shipping: Linking Past and Present

f) Industrialization, Trade, and Transport: A Timeline of Economic Transformation

g) "Global Trade and Transport: Tracing the Threads of Interconnected Economies"

3. "Complete any four Social Science sample papers in your notebook and study the entire syllabus thoroughly."

CLASS X winter Vacation.
Holiday Home work
Science (Chemistry)

Q: 1 Which of the following is an example of simple displacement?

1. the electrolysis of water
2. the burning of methane
3. the reaction of a metal with an acid
4. the reaction of two salt solutions to form a precipitate

Q: 2 Which of the following is a NECESSARY condition for ALL chemical reactions?

1. The reactants should be in the same state.
2. Energy should be supplied to the reactants.
3. The reactants should be at the same temperature.
4. There should be physical contact between the reactants.

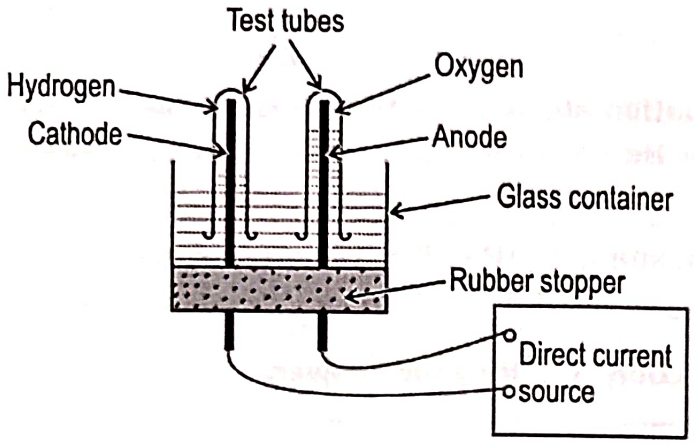
Q: 3 Given below is the balanced chemical equation for the thermal decomposition of lead nitrate.

$$2\ Pb(NO_3)_2 \text{---> } 2\ PbO + 4\ NO_2 + O_2$$

Which of the following information does the coefficients of PbO and NO_2 in the equation (2 and 4 respectively) tell us?

1. the ratio of the number of moles produced of the two substances
2. the ratio of the number of atoms in the two substances
3. the ratio of the mass produced of the two substances
4. the ratio of the densities of the two substances

Q: 4 **The diagram below shows the set-up in which electrolysis of water takes place.** **[3]**



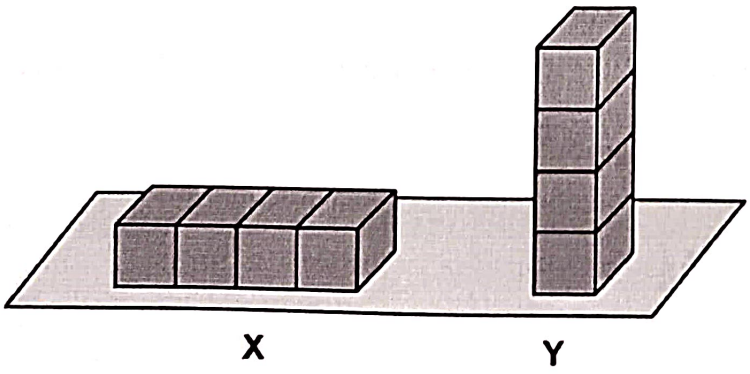
(a) What type of reaction takes place?

(b) Explain why this is an example of an endothermic reaction?

(c) The test tube containing hydrogen is removed carefully from the apparatus. A lit match stick is brought near the mouth of this test tube. The gas burns with an explosive "pop" sound.

Write a balanced chemical equation for this reaction and indicate whether energy is absorbed or released.

Q: 5 **Eight identical, iron blocks are placed on the ground in the two arrangements X and Y as shown below. The block arrangements are kept moist by sprinkling water every few hours** **[2]**



Which of the arrangements is likely to gather more rust after ten days? Justify your answer.

Q: 6 The following chemical equation does not represent a chemical reaction that can take place. [1]

$3\ Fe\ (s) + 4\ H_2O\ (l) \text{-----> } Fe_3O_4\ (s)$

State what needs to be changed in the equation above for it to represent the correct reaction between Fe and H_2O.

Q: 7 Trupti mixes an aqueous solution of sodium sulphate (Na_2SO_4) and an aqueous solution of copper chloride ($CuCl_2$). [2]

Will this lead to a double displacement reaction? Justify your answer.

Q: 8 Dilip was comparing combination reactions with decomposition reactions. [1]

Which class of chemical substances may be the product of a decomposition reaction but NOT a product of a combination reaction?

Q: 9 Write the balanced chemical equation of any one reaction that CANNOT be classified as combination, decomposition, simple displacement or double displacement. [1]

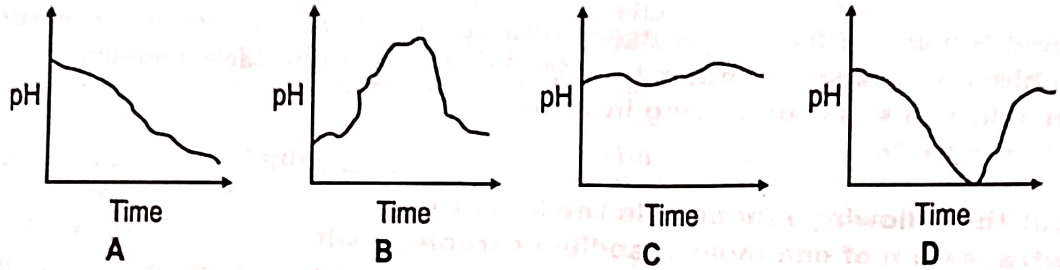
Q: 10 Tina finds a paper covered with a white substance in a chemistry lab. She keeps the paper near the window of the lab and comes back to pick it up after five hours to take it home. She noticed that the white substance had turned grey. [3]

(a) What could be the most likely substance on the paper that Tina found?
(b) The substance changed from white to grey. Write the chemical equation for this reaction.
(c) State ONE application of this property of the substance seen in daily life.

Q: 1 **Adding which of the following to a colourless solution would give an indication that the solution could possibly be hydrochloric acid?**

1 copper metal strips
2 silver metal strips
3 calcium carbonate
4 sodium chloride

Q: 2 **Which of these graphs shows how the pH of milk changes as it forms curd?**



Q: 3 **The following table lists the pH values of some substances.** **[1]**

Solutions	pH
hydrochloric acid	1
milk	6
pure water	7
baking soda	9
sodium hydroxide	14

What would happen to the pH of an acid and a base when each is diluted (pure distilled water is added to it)?

Q: 4 **The pH of three solutions is given in the table. Answer the questions that follow.** **[3]**

Solution	pH
P	1
Q	7
R	14

(a) Which of these solutions could possibly react with zinc metal to produce hydrogen gas?
(b) Which of these solutions could be formed by the reaction of a metal oxide with water?
(c) Which of these solutions could be the raw material for the industrial manufacture of chlorine?

Q: 5 A remarkable property of acids is that they can 'dissolve' metals. When metals are added to an acid, they disintegrate and disappear into the acid. [5]

(a) State one other common observation when metals 'dissolve' in acids. Explain the reason for this observation.

(b) If the acid with the 'dissolved' metal is evaporated, can we get the metal back? Why or why not?

(c) In this question, the word 'dissolve' is used within quotes. This is because it is not actually an example of dissolving. What is the MAIN difference between a metal 'dissolving' in an acid and sugar dissolving in water?

Q: 6 Sunita carried out the following reactions in the laboratory: [3]
(i) complete neutralisation of one mole of sodium carbonate with hydrochloric acid
(ii) complete neutralisation of one mole of sodium bicarbonate with hydrochloric acid

She found that the amount of carbon dioxide formed in both the reactions was the same.

(a) Is her finding correct? Justify your answer.
(b) How does the amount of salt formed in case (i) compare with the amount of salt formed in case (ii)?

Q: 7 To prepare a salad dressing, Parag adds a solution of sodium chloride in distilled water to vinegar. [2]

State what change will occur in the following:
(i) the pH of the vinegar
(ii) the acidity of the vinegar

Rajesh was given a substance and asked to identify it. He conducted three tests on the substance and recorded the results below.(P) It releases carbon dioxide, water and a sodium salt on heating with water.(Q) It turns universal indicator greenish-blue.(R) It can be prepared from ammonia as a raw material.

Q: 8 What substance was Rajesh given? [1]

Q: 9 Give ONE use of the substance based on the properties mentioned in P and Q. [1]

Q: 10 Rajesh later read that recrystallisation of the sodium salt formed in P gives another basic salt that is used in manufacture of borax. [1]

Identify the sodium salt formed in P.

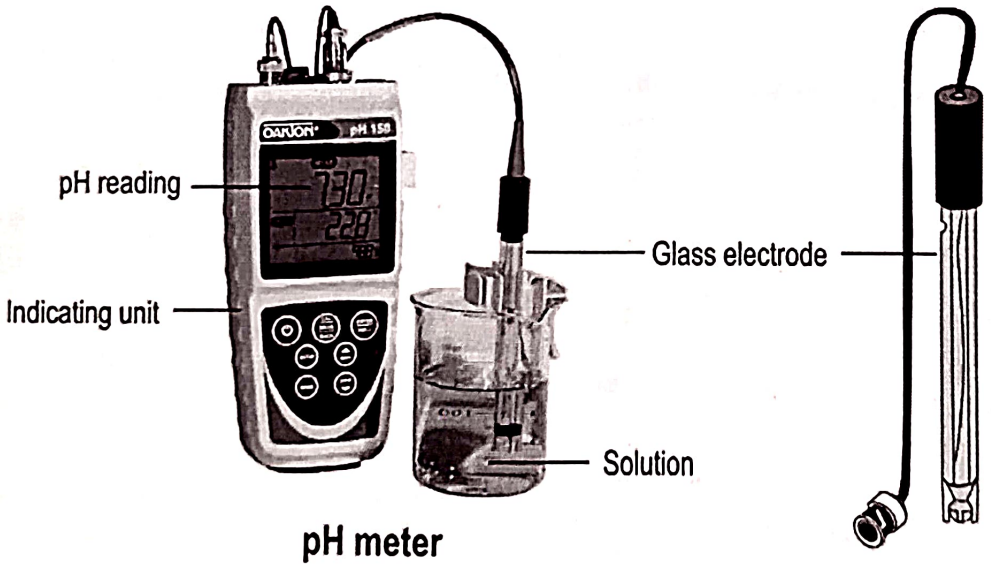
Q: 11 Aditi finds that a mixture of an acid and a base does not change the colour of either red or blue litmus paper. [1]

Compare the amounts of H^+ and OH^- in the solution.

Q: 12 pH is measured on a scale of 0 to 14, with lower values indicating high hydrogen ion concentration (more acidic) and higher values indicating low hydrogen ion concentration (less acidic). A pH of 7 is considered as neutral. Every whole unit in pH represents a ten-fold increase in or decrease in hydrogen ion concentration. [1]

What would the hydrogen ion concentration of a solution of pH 4 be compared to a solution of pH 8?

Q: 13 pH is measured using a pH meter, which comprises a detecting unit consisting of a pH sensitive glass electrode and an indicating unit which indicates the pH as shown below. [2]



pH meter

To measure the pH of a solution, the glass electrode is dipped into the solution and the pH is displayed on the screen of the indicating unit. Before measuring the pH of another solution, the glass electrode is rinsed with distilled water and dried carefully with tissue paper.

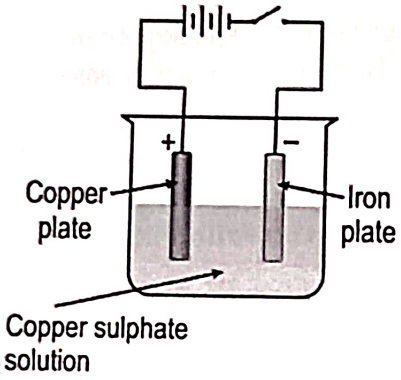
How is the pH reading of the second solution likely to be affected if the glass electrode is not dried with tissue paper in the following cases?
(I) If the second solution being measured is acidic in nature
(II) If the second solution being measured is basic in nature

Q: 14 **Dipti has three flasks containing dilute hydrochloric acid, dilute sulphuric acid and dilute sodium hydroxide respectively. The flasks are not labeled and she does not have any pH indicator.** **[2]**

(a) Which of the solutions will she be able to identify just by making mixtures of pairs of the substances.
(b) What observation will help her to make this identification?

Answer any four of the following five questions based on the information given below.

Krunal connected a copper plate and an iron plate to the positive and negative terminals of a battery respectively along with a switch. He immersed the plates into a beaker containing acidified copper sulphate solution.



Q: 1 **After a few minutes, even before he turned the switch on, he noticed that copper was deposited on the iron plate.**

This could have been due to _____.

1. electrolysis
2. electroplating
3. a combination reaction
4. a displacement reaction

Q: 2 **Which of the following is likely to happen when the current is started?**

1. Iron will be deposited on the copper plate.
2. Copper will continue to be deposited on the iron plate.
3. No reaction will occur at the iron plate or at the copper plate.
4. The copper already deposited on the iron plate will go back into the solution.

Q: 3 **Krunal now replaces the iron plate with a silver plate. He sees that there is no deposition of copper on the silver plate before starting the current.**

Which of the following could be the reason?

1. Silver is more reactive than iron.
2. Silver is less reactive than copper.
3. Silver is a poorer conductor of electricity than iron.
4. Silver is a better conductor of electricity than copper.

Q: 4 **What is likely to happen to the concentration of copper sulphate in the solution on passing electric current through the solution in the set-up with the silver plate?**

1. It will increase.
2. It will decrease.
3. It will remain the same.
4. (Cannot say without knowing the amount of current passed.)

Q: 5 **Which of the following will happen to the weights of the silver and copper plates after passing the current for some time?**

1. The weight of the silver plate will increase and that of the copper plate will decrease.
2. The weight of the copper plate will increase and that of the silver plate will decrease.
3. Both the plates will decrease in weight.
4. Both the plates will increase in weight.

Q: 6 **Three pieces of a rust free iron rod are completely coated with the following:** **[5]**

(i) plastic
(ii) oil paint
(iii) zinc

An identical scratch is made on each piece, thus exposing the iron. The pieces of iron are kept exposed to moist air for 10 days and then checked for rust formation.

(a) State if rusting will be observed at the point of the scratch on the three iron pieces.

(b) Give reasons for your answer in each case.

(c) Name the process of applying a protective zinc coating to steel or iron.

Q: 7 **Listed here is the reactivity of certain metals.** **[1]**

Metal	Reaction with air	Reaction with water	Reaction with dilute acids
Gold	Does not oxidise or burn	No reaction	No reaction
Sodium	Burns vigorously to form an oxide	Violent reaction	Violent reaction
Zinc	Burns to form an oxide	Reacts on heating	Reacts to produce hydrogen
Platinum	No reaction	Does not dissolve or react	No reaction

From the list above, identify the metal(s) that are likely to be found in a pure state in the Earth's crust.

Q: 8 The blue-coloured solution of the sulphate salt of metal W is taken in a beaker. Metal powders X, Y and Z are added one after the other to the beaker. The colour changes occurring in the solution are shown below. [2]

$W\text{-}SO_4$ (Blue solution) $\xrightarrow{\text{Metal X}}$ Colourless solution $\xrightarrow{\text{Metal Y}}$ Pink solution $\xrightarrow{\text{Metal Z}}$ Green solution

State what colour change, if any, will occur if metal X is again added to the green solution in the beaker. Explain why.

Q: 9 A piece of iron rusts when it comes in contact with air and moisture. Prakash had two identical shiny iron pieces P and Q. To prevent the pieces from rusting, he coated piece P with oil paint and he galvanized piece Q with a coat of zinc metal. He noticed that the coatings were not complete and that a small part of the iron was exposed in both the pieces. [4]

What is Prakash likely to observe about the exposed parts of the two iron pieces after some days? Explain why.

Q: 10 Read the following statements. [2]

(P) Stainless steel does not rust.
(Q) Iron, nickel and chromium form an alloy.

Does statement (Q) present a valid explanation for statement (P)? Justify your answer.

Q: 11 A teacher asks her students to identify a metal, M. She gives them the following clues to help them. [3]

(P) Its oxide reacts with both HCl and NaOH.
(Q) It does not react with hot or cold water but reacts with steam.
(R) It can be extracted by electrolysis of its ore.

(a) Identify the metal.
(b) Write the chemical equations for the reaction of the metal with HCl and NaOH respectively.
(c) What would happen if the metal is reacted with iron oxide?

Q: 12 A metal oxide on being heated with carbon does NOT produce carbon dioxide. [1]

Give a possible explanation for this behaviour of the metal oxide.

11

Q: 13 **A metallic element, M, has the following properties:** **[2]**

- **floats on water**
- **can be cut with a knife**
- **occurs naturally as its chloride, of formula MCl**
- **its oxide dissolves in water to form the hydroxide**

(a) State the method of manufacture of the metal M.
(b) Name the major byproduct obtained in the process.

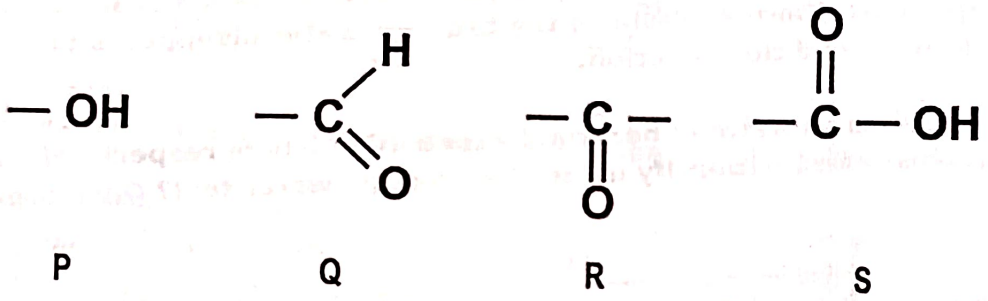
Q: 1 **On undergoing complete combustion in an adequate supply of oxygen, an organic compound produces only carbon dioxide and water vapour as the products.**

Based on this information, which of the following homologous series could the compound belong to?

P) alkanes
Q) alcohols
R) aldehydes

1 only P **2** only P or Q **3** only Q or R **4** any - P, Q or R

Q: 2 **A compound with which of the following functional groups is MOST LIKELY to cause the decomposition of baking soda to produce carbon dioxide?**



P Q R S

1 P **2** Q **3** R **4** S

Q: 3 **1 mole of ethene and 1 mole of ethyne are separately made to completely undergo addition reaction to form the respective saturated compound.**

Which of the following will be DIFFERENT for the two reactions?

P) the number of moles of the saturated compound formed
Q) the number of moles of the hydrogen consumed

1 only P **2** only Q **3** both P and Q **4** neither P nor Q

Q: 4 **Two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Read the statements carefully and choose the option that correctly describes statements A and R.**

Assertion (A): Vegetable oils are healthier than animal fats.
Reason (R): Vegetable oils generally have long unsaturated carbon chains while animal fats have saturated carbon chains.

1 Both A and R are true and R is the correct explanation for A.
2 Both A and R are true and R is not the correct explanation for A.
3 A is true but R is false.
4 A is false but R is true.

Q: 5 Alkanes are saturated compounds of carbon and hydrogen that can be represented by the general formula C_nH_{2n+2} where 'n' is the number of carbon atoms. An example of such a compound is ethane C_2H_6. [3]

Maya has a compound of carbon and hydrogen whose formula is C_3H_4.

(i) What is true about the type of flame this compound will give on combustion?

(ii) Draw all the possible straight chain structures of this compound.

Q: 6 [1]

Bromine water is a reddish solution of bromine (Br_2) in water. When shaken with an unsaturated hydrocarbon, the red colour of the bromine water disappears because the bromine is used up in an addition reaction.

Kohli has three test tubes containing hexane, hexene and hexyne respectively. Which of the three compounds can he identify using the bromine water test? Give a reason for your answer.

Q: 7 A carbon compound of molecular formula $C_5H_{10}O$ contains a ketone functional group. [3]

Draw the structures of three isomers of this compound having a ketone group.

Q: 8 Ethanol, C_2H_5OH is heated with alkaline potassium permanganate to give a compound X. [3]

$$C_2H_5OH \xrightarrow{\text{alkaline } KMnO_4 + \text{heat}} X$$

(a) How many carbon atoms will compound X contain?

(b) Compound X is now reacted with ethanol in the presence of an acid catalyst to give a compound Y.

$$X + C_2H_5OH \xrightarrow{\text{acid}} Y$$

(i) Name the type of compound formed in the above reaction with respect to the functional group it contains.
(ii) State one characteristic property of compounds of the type of compound Y.
(iii) State one use of compounds of this type.

Q: 9 Compounds with identical molecular formula but different structures are called structural isomers. [3]

(a) In the case of saturated hydrocarbons, what is the MINIMUM number of carbon atoms needed in a molecule for it to have a structural isomer?
(b) Draw the structural isomers of the saturated hydrocarbon having the minimum number of carbon atoms mentioned in (a).

Q: 10 An open-chain hydrocarbon X having the general formula of C_nH_{2n-2} is hydrogenated in the presence of a catalyst. [3]

(a) State the number of moles of hydrogen required to completely saturate 1 mole of compound X.
(b) The hydrocarbon X contains carbon-carbon single bonds. Apart from the single bonds, state the number and the type of other carbon-carbon bonds that could possibly be present in the compound X.

Q: 11 Shown below are the structural formulae of four carbon compounds. [3]

$CH_3-\underset{\underset{O}{\|}}{C}-CH_3$	$CH_3-\underset{\underset{OH}{\|}}{CH}-CH_3$	$CH_3-CH_2-\underset{\underset{O}{\|}}{C}-OH$	CH_3-OH
P	Q	R	S

(a) Two of these compounds are more likely to have similar chemical properties. Identify these two compounds. Give a reason for your answer.
(b) Identify which of these compounds are likely to have the same boiling point. Justify your answer.

Q: 12 Heating an alcohol with concentrated sulphuric acid results in the dehydration of the alcohol to give the alkene as shown by the reaction of ethanol to give ethene. [2]

$$CH_3CH_2OH \xrightarrow{\text{Hot conc. sulphuric acid}} CH_2=CH_2$$

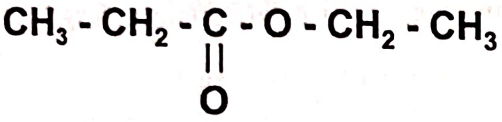
Pramila heated 2-butanol (shown below) with concentrated sulphuric acid.

$$CH_3CH_2\underset{\underset{OH}{\|}}{CH}CH_3$$

Write the structural formulae of all the possible products of the reaction.

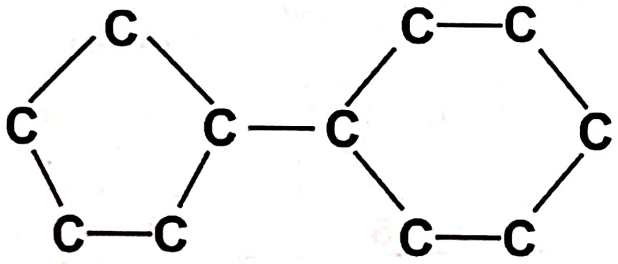
Q: 13 Ethyl propanoate is a colourless compound with a pineapple-like smell. It is present naturally in some fruits such as kiwis and strawberries. [4]

The structural formula of ethyl propanoate is given below.



(a) Write the names of the carboxylic acid and the alcohol from which this compound is formed.
(b) Apart from mixing the carboxylic acid and the alcohol, what should be done to form this compound?

Q: 14 An alkane has 11 carbon atoms arranged within ring structures as shown below. [1]



What is the molecular formula of the alkane?

Q: 15 Manasi wrote the names of four compounds as the first members of their respective homologous series. [3]

- methanol
- methanal
- methanone
- methanoic acid

(a) Which name has she written incorrectly? Justify your answer.
(b) What name should she have written instead?

Q: 16 Organic compounds belonging to different homologous series can be isomers. For example, propanal and propanone are isomers. [2]

Can an alkane and an alcohol be isomers? Why or why not?

Q: 17 Home-made vinegar is produced from wine. The wine is taken in a clean glass jar and shaken well to aerate it. Some water is added to the jar and then it is kept undisturbed in a dark place at room temperature to undergo fermentation. After 3-4 weeks, the vinegar would be ready to use. [4]

(a) Name the functional groups of the MAIN organic compounds present in wine and vinegar.
(b) Based on the atoms getting added/removed when wine is converted to vinegar, name the type of reaction that happens.
(c) Name any chemical reagent that would be used for the same reaction if it is carried out in the laboratory.

Q: 18 Polythene is a plastic made from ethene ($CH_2=CH_2$). When ethene is subjected to high pressure and moderately high temperatures, ethene molecules react with each other to form large molecules hundreds of times bigger, forming the plastic. [1]

Which property of carbon atoms is instrumental in the formation of polythene?

Q: 19 Study the following information given and answer the questions that follow. [3]

Ethanol is a renewable biofuel because it is made from biomass. Ethanol is a clear, colourless alcohol made from a variety of biomass materials. Ethanol producers mostly use food grains and crops with high starch and sugar content such as corn, sorghum, barley, sugar cane, and sugar beets. The most common ethanol production processes today use yeast to ferment the starch and sugars in corn, sugar cane, and sugar beets.

(a) What is the chemical formula for ethanol?
(b) What other compound is obtained as a by-product when ethanol is obtained from a sugar?
(c) What would be the products formed when ethanol undergoes complete combustion? Support your answer with a balanced chemical equation.

CLASS X BIOLOGY QUESTION BANK

CHAPTER 1 – LIFE PROCESSES

A. Objective Questions (15)

MCQs

1. The opening and closing of stomata is regulated by:
   a) Guard cells b) Xylem c) Phloem d) Root hair
2. Breakdown of glucose in absence of oxygen produces:
   a) CO_2 & water b) Alcohol c) Lactic acid d) Both (b) & (c)
3. The energy currency of the cell is:
   a) ATP b) DNA c) Protein d) Fat
4. Which blood vessel carries oxygenated blood?
   a) Veins b) Arteries c) Capillaries d) None
5. Transpiration occurs mainly through:
   a) Stem b) Roots c) Stomata d) Flowers

True/False

6. Phloem transports water.
7. Villi increase the surface area of small intestine.
8. Arteries have thin walls.
9. Photosynthesis occurs in chloroplast.
10. Nephrons are filtration units of the kidney.

Fill in the blanks

11. The mode of nutrition in fungi is _____.
12. The cardiac muscle is found in _____.
13. The functional unit of kidney is _____.
14. Digestion of proteins begins in the _____.
15. Plants absorb water through _____.

B. Short Answer Questions (10)

1. What is photosynthesis?
2. Define autotrophic nutrition.
3. What are peristaltic movements?
4. What is the function of bile?
5. Define breathing.
6. What is double circulation?
7. Write two functions of stomata.
8. Why do arteries have thick walls?
9. What is excretion?
10. What is lymph?

C. Long Answer Questions (10)

1. Explain the process of respiration in humans.
2. Describe the structure and function of the nephron.
3. Explain nutrition in amoeba.
4. Describe the human digestive system.
5. Explain the mechanism of photosynthesis.
6. Describe transportation of food and water in plants.
7. Explain aerobic and anaerobic respiration with differences.
8. Describe the human circulatory system.
9. What are the types of nutrition in plants and animals?
10. Explain the process of excretion in plants.

D. Competency-Based Questions (5)

1. A person breathes fast after running. Explain why.
2. A plant kept in dark does not photosynthesize. Explain.
3. Urine becomes concentrated when a person is dehydrated. Explain.
4. A patient has low hemoglobin. How will it affect the body?
5. A leaking valve in the heart affects circulation. Explain.

CHAPTER 2 – CONTROL AND COORDINATION

A. Objective Questions (15)

MCQs

1. The functional unit of the nervous system is:
   a) Axon b) Neuron c) Dendrite d) Synapse
2. The growth-promoting hormone in plants is:
   a) Auxin b) Cytokinin c) Ethylene d) Gibberellin
3. The part of the brain responsible for balance is:
   a) Cerebrum b) Cerebellum c) Medulla d) Pons
4. Reflex actions are controlled by:
   a) Brain b) Spinal cord c) Cerebrum d) Medulla
5. Movement of a plant part in response to light is called:
   a) Geotropism b) Phototropism
   c) Thigmotropism d) Chemotropism

True/False

6. Hypothalamus secretes insulin.
7. Nerves carry messages in the form of electrical impulses.
8. Pancreas is both endocrine and exocrine gland.

9. Ethylene promotes fruit ripening.
10. Cerebrum controls intelligence and memory.

Fill in the blanks

11. The junction between two neurons is called _____.
12. IAA is a type of _____.
13. The longest cell in the body is _____.
14. Movement of root toward gravity is called _____.
15. The gland called 'master gland' is _____.

B. Short Answer Questions (10)

1. What is a neuron?
2. Define reflex action.
3. What is synapse?
4. Why is the brain protected in a bony box?
5. What are plant hormones?
6. Define phototropism.
7. What is the function of cerebellum?
8. What is a nerve impulse?
9. Define endocrine glands.
10. Write two differences between voluntary and involuntary actions.

C. Long Answer Questions (10)

1. Explain the structure of a neuron.
2. Describe the human brain with functions of its parts.
3. Explain the mechanism of reflex action.
4. Describe chemical coordination in animals.
5. Explain different types of tropisms in plants.
6. What are plant hormones? Explain their types.
7. Describe how nervous system and endocrine system coordinate.
8. Explain transmission of nerve impulse.
9. What is feedback mechanism in hormones?
10. Describe how plants show movement despite being fixed.

D. Competency-Based Questions (5)

1. A boy withdraws his hand immediately after touching a hot pan. Explain.
2. A plant kept near a window bends toward light. Explain.
3. A person with damaged cerebellum cannot walk properly. Explain.

4. A diabetic patient takes insulin. Explain its role.
5. A child responds differently to sudden loud sound. Explain using nervous system.

CHAPTER 3 – HOW DO ORGANISMS REPRODUCE

A. Objective Questions (15)

MCQs

1. Binary fission occurs in:
   a) Amoeba b) Yeast c) Hydra d) Planaria
2. Budding occurs in:
   a) Amoeba b) Hydra c) Paramecium d) Mould
3. Male gametes in plants are carried by:
   a) Ovary b) Stigma c) Pollens d) Anther
4. The process of fusion of gametes is called:
   a) Fertilization b) Pollination
   c) Reproduction d) Implantation
5. The contraceptive method that prevents fertilization:
   a) Condom b) Copper-T
   c) Oral pills d) All

True/False

6. Vegetative propagation requires seeds.
7. DNA copying is an essential part of reproduction.
8. Hydra reproduces by budding.
9. Fertilization occurs in the ovary.
10. Pollination is the transfer of pollen grains.

Fill in the blanks

11. The fusion of male and female gametes is called _____.
12. Tubectomy is performed on _____.
13. _____ produces sperms.
14. The embryo gets nutrition from _____.
15. Rhizome is a mode of _____ reproduction.

B. Short Answer Questions (10)

1. Define reproduction.
2. What is binary fission?
3. Define budding.
4. What is pollination?
5. Why is variation important?
6. What is placenta?

7. What are STDs? Give two examples.
8. What is vegetative propagation?
9. What is contraception?
10. What is fertilization?

C. Long Answer Questions (10)

1. Explain the process of sexual reproduction in flowering plants.
2. Describe the human male reproductive system.
3. Describe the human female reproductive system.
4. Explain fertilization and development in humans.
5. Explain asexual reproduction in plants.
6. Describe different methods of contraception.
7. Compare sexual and asexual reproduction.
8. What are reproductive health problems? Explain.
9. Describe DNA copying and variation.
10. Explain vegetative propagation with examples.

D. Competency-Based Questions (5)

1. A gardener uses stem cuttings to grow plants. Explain the science behind it.
2. A couple avoids pregnancy using copper-T. Explain how it works.
3. A seedless grape plant is obtained from grafting. Explain.
4. A boy resembles his parents. Explain due to which process.
5. Twins develop from the same zygote. Explain.

CHAPTER 4 – HEREDITY

A. Objective Questions (15)

MCQs

1. The father of genetics is:
   a) Mendel b) Darwin c) Lamarck d) Watson
2. Mendel worked on:
   a) Rats b) Pea plants c) Dogs d) Bacteria
3. The trait that appears in the F_1 generation is:
   a) Recessive b) Dominant
   c) Neutral d) None
4. Genes are present on:
   a) DNA b) Chromosome
   c) Ribosome d) Cytoplasm
5. Sex of a child is determined by:
   a) Mother b) Father c) Both d) None

True/False

6. Acquisition of characters is inheritable.
7. XX chromosome combination produces a girl.
8. Tall trait (T) is dominant over dwarf (t).
9. DNA is the hereditary material.
10. Mendel proposed laws of inheritance.

Fill in the blanks

11. The alternative forms of genes are called _____.
12. Genes are segments of _____.
13. The phenotype depends on _____.
14. A trait not expressed in F_1 may reappear in _____ generation.
15. Sex-linked traits are carried on _____.

B. Short Answer Questions (10)

1. What is heredity?
2. Define variation.
3. What is genotype?
4. What is phenotype?
5. Why did Mendel use pea plants?
6. What are dominant and recessive traits?
7. Define sex chromosomes.
8. What are inherited traits?
9. What is a monohybrid cross?
10. What are homologous chromosomes?

C. Long Answer Questions (10)

1. Explain Mendel's monohybrid cross with results.
2. Write Mendel's laws of inheritance.
3. Explain sex determination in humans.
4. What are acquired and inherited traits? Explain.
5. Discuss sex-linked traits with examples.
6. Explain heredity and variation in detail.
7. Describe dihybrid cross.
8. Explain how characters are transmitted from parents to offspring.
9. What is DNA? Describe its structure.
10. Explain how environment influences traits.

D. Competency-Based Questions (5)

1. A tall plant (TT) is crossed with a dwarf plant (tt). Predict offspring height.
2. A child is color-blind. Explain how the trait is inherited.
3. A boy resembles grandfather more than father. Explain.
4. A woman (XX) and man (XY) have a girl child. Explain sex determination.
5. In a dihybrid cross, new combinations appear. Explain the reason.

CHAPTER 5 – OUR ENVIRONMENT

A. Objective Questions (15)

MCQs

1. The lowest level of the food chain is:
   a) Carnivore b) Herbivore c) Producer d) Decomposer
2. The process of breaking down complex substances by bacteria is:
   a) Photosynthesis b) Decomposition
   c) Respiration d) Pollution
3. The energy flow in an ecosystem is:
   a) Cyclic b) Unidirectional
   c) Multidirectional d) None
4. Ozone layer protects us from:
   a) Infrared rays b) UV rays
   c) Radio waves d) Visible light
5. Non-biodegradable waste is:
   a) Paper b) Cotton c) Plastic d) Food

True/False

6. Food chain starts with animals.
7. Plastic is biodegradable.
8. Ozone depletion is harmful.
9. Decomposers recycle nutrients.
10. Pyramids of energy are always upright.

Fill in the blanks

11. The top consumer in a food chain is _____.
12. Ozone is a molecule made of _____ oxygen atoms.
13. Decomposers include _____ and _____.
14. The increase in concentration of harmful chemicals in organisms is called _____.
15. Waste that can be broken down naturally is called _____.

B. Short Answer Questions (10)

1. Define environment.
2. What are trophic levels?

3. What is a food chain?
4. What are decomposers?
5. What is ozone?
6. What is biodegradable waste?
7. Define biomagnification.
8. What is 3R principle?
9. What are producers?
10. Why are food chains generally short?

C. Long Answer Questions (10)

1. Explain components of the ecosystem.
2. Describe food chain and food web.
3. Explain biogeochemical cycles.
4. What is biomagnification? Explain with example.
5. Describe the ozone layer and its importance.
6. Describe the harmful effects of plastics.
7. Explain the 3Rs of waste management.
8. Describe energy flow in an ecosystem.
9. Explain how human activities affect the environment.
10. Explain biodegradable and non-biodegradable substances with examples.

D. Competency-Based Questions (5)

1. A lake receives chemical waste. Explain biomagnification effects.
2. A forest is cut down for farming. Predict ecosystem changes.
3. A student observes many food chains linked together. Identify and explain.
4. Plastic dumped in soil affects plant growth. Explain.
5. A city reduces plastic use. Predict environmental benefits.

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