

UDUPI MID-TERM SCIENCE KEY PAPER

2019 – 20

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I. Four alternatives are provided for each of the following questions or incomplete statements. Choose the most appropriate alternative and write with its alphabet. $8 \times 1 = 8$

1. Waste products are stored as resins and gums in the following part of the plant body.

- a). Xylem b). Phloem c). Parenchyma d). Sclerenchyma

2. Instrument used to detect the presence of electric current.

- a). Galvanometer b). Fuse c). Ammeter d). Voltmeter

3. The plant hormones which help in the growth of the stem and wilting of the leaves are

- a). Auxins and gibberellins b). Gibberellins and abscisic acid
c). Auxin and cytokinins d). Auxin and abscisic acid

4. The pH values of 4 solutions A, B, C, D are 5, 12, 8 and 9 respectively. The correct decreasing order of their hydroxyl ion concentration is

- a). $A > B > C > D$ b). $D > C > B > A$ c). $A > C > D > B$ d). $B > D > C > A$

5. Angle between the direction of electric current and magnetic field for which motor force is maximum.

- a). 45° b). 40° c). 0° d). 90°

6. $Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$. This chemical reaction is not a double displacement reaction. Conclusion for this statement is

- a). Precipitate is formed. b). Insoluble substance is formed
c). There is an exchange of ions between the reactants
d). More reactive element displaces less reactive element from its compound.

7. Silver articles generally turn black when kept in the open for a few days, because

- a). Formation of silver carbonate layer b). Formation of silver sulphide
c). Formation of silver hydride d). Formation of silver chloride

8. SI unit of potential difference is

- a). Ampere b). Volt c). Ohm d). Second

II. Answer the following questions $8 \times 1 = 8$

9. Name the parts of human brain which control the following actions

- a) Riding a bicycle b) salivation

Ans: a) Riding a bicycle : cerebellum (co-ordination between pedalling and steering)

- b) Salivation : Pons (It controls sleep and consciousness, breathing, bladder control, Hearing, Equilibrium, taste, Swallowing, Eye movement and secretion of saliva)

10. Will the current induced when coil and magnet both are at rest ? justify your answer.

Ans: Current is not induced when coil and magnet both are at rest. Current is induced when there is a relative motion exists between a conductor/coil and magnet.

11. “ All the manufacturing companies to make CFC – free refrigerators throughout the world” Why.

Ans: CFC free refrigerators are ozone friendly and climate friendly refrigerators. Because it do not uses chlorofluorocarbons (CFCs) or Fluorocarbons (FCs). CFCs damage the ozone layer in the upper atmosphere and FCs contribute to green house effect.

12. Write the chemical equation of thermit reaction which is used to join railway tracks.

Ans: Thermite reaction is highly exothermic reaction. The amount of heat evolved is so large that the metals are produced in the molten state. The reaction of Iron (III) oxide (Fe_2O_3) with aluminium is used to join railway tracks or cracked machine parts. This reaction is known as Thermite reaction.



13. Write a difference between dynamo and motor.

Ans:

DYNAMO	MOTOR
Dynamo converts mechanical energy into electrical energy. A dynamo takes in motion and outputs electricity.	Motor converts electrical energy into mechanical energy. Motor takes in electricity and outputs motion

14. Magnesium ribbon burns with oxygen and forms white substance of magnesium this reaction is considered as an exothermic reaction Why ?

Ans: When magnesium burns with oxygen it gives Magnesium oxide which releases heat energy.

15. You are given a copper coi, 6 V battery and iron pieces. Using them which effect of electric current can be identified and how?

Ans: When 6V battery is connected to a copper coil current is produced and a magnetic field is generated perpendicular to it. Due to this magnetic effect of electric current, iron pieces will get attracted to the copper coil till current flows in the circuit. As battery disconnected, iron pieces will be automatically separated from the coil.

16. By using litmus indicator show that non – metallic oxides are not a basic oxide.

Ans: Non metallic oxides dissolves in water and form solution. Then put blue and red litmus paper in it. If blue litmus paper turns red, then the solution is acidic. If red litmus paper turns blue then the solution is basic. In case of non metallic oxides are acidic which turns blue litmus to red.

III. Answer the following questions.

8 x 2 = 16

17. It is important for us to have iodiser salt in our diet. Give reasons for this OR

How the chemical communication differ from electrical impulse to achieve the communication Between the cells in multicellular organisms.

Ans:1. To prevent Goiter.

2. To maintain sufficient iodine intake
3. Iodine stimulates the Thyroid gland to produce thyroxine hormone
4. Thyroxine helps in metabolism.

OR

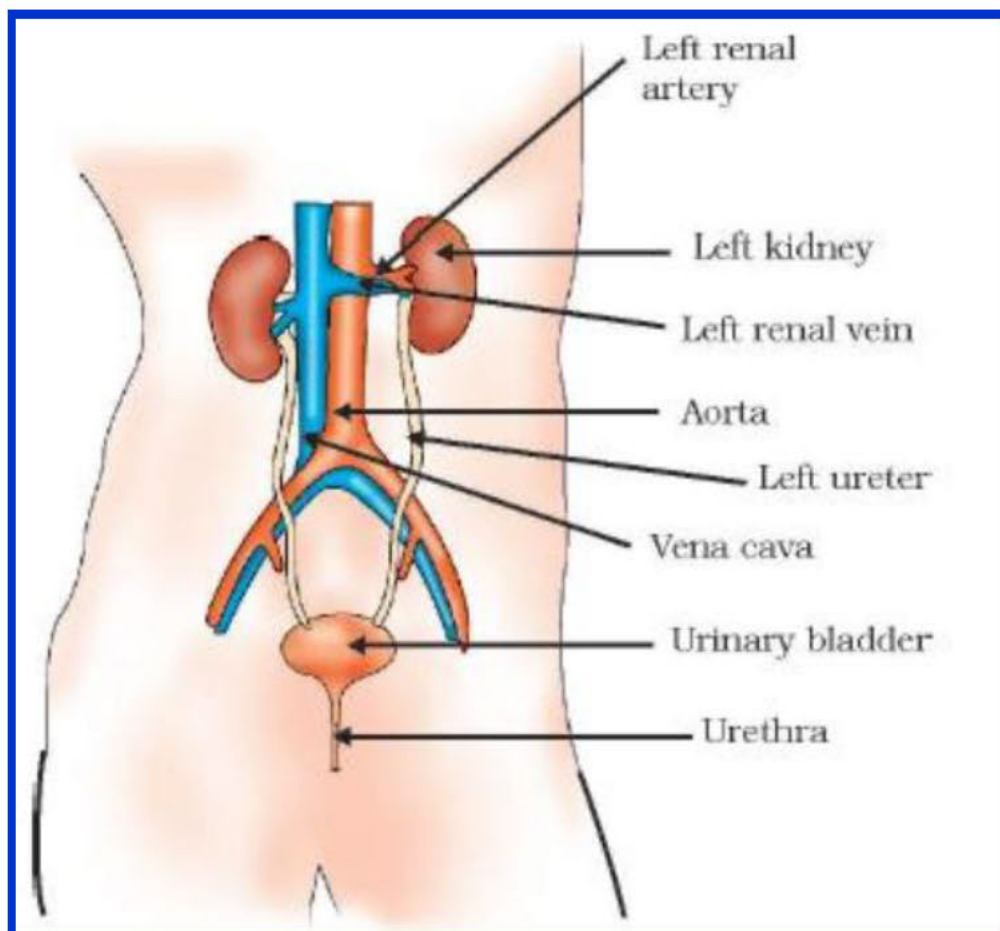
Communication from electrical impulses / signals are through neurons. Chemical communication are through endocrine glands. Messages passes through neuron is electrical and chemical messengers called hormones carried through blood to the target cells.

18. Explain with an example how the biological magnification and energy flow varies in the food Chain of eco system.

Ans: Biological magnification is the build up of toxins in a food chain. Flow of energy decreases in the food chain. Flow of energy is unidirectional but flow of matter is cyclic.

19. Draw the diagram of excretory system and label any two parts.

Ans:



20. Define Ohm's Law.

Ans: Ohm's law states that the electrical current (I) flows in an circuit is proportional to the voltage (V) and inversely proportional to the resistance

21. " Displacement reactions are redox reactions " Justify your answer

Ans: Single displacement reaction is another type of redox reaction in which an element replaces / displaces another from a compound. The element which replaces that which is in a compound is always oxidised. The element being displaced is always reduced.

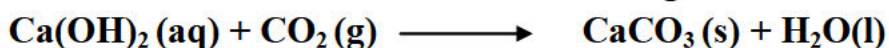
22. What is water of crystallisation ? Write any one of the hydrated salt with its chemical formula

OR A student prepares calcium hydrogen carbonate instead of calcium carbonate while passing carbon di - oxide through lime water. Write your conclusion with the chemical equation.

Ans: Water molecule forming an essential part of the crystal structure of some compounds OR Fixed number of water molecules present in one formula unit of a salt. Ex: copper sulphate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), Washing Soda ($\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$), Plaster of paris ($\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$)

OR

Carbon dioxide reacts with lime water it gives calcium carbonate

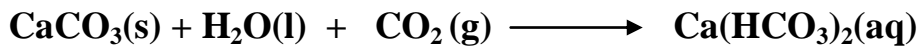


Lime water

White precipitate

Calcium carbonate

On passing excess carbon di oxide calcium hydrogen carbonate is formed.



Lime water

Soluble in water

Calcium hydrogen carbonate

23. Find the amount of work done when 2C charges move between two points of potential difference 12V

Ans: $Q=2C$

$V=12V$

$W=V*Q=12*2=24J$

24. How can the metals of top most series be extracted from their ores ? Explain the process in Which elements deposited at cathode and anode.

Ans: Metals of topmost series are very reactive. They cannot be obtained from their compounds by heating with carbon. Carbon cannot reduce these metals because these metals have more affinity for oxygen than carbon. These metals are obtained by electrolytic reduction. Metals are deposited at cathode.

IV. Answer the following questions.

9 x 3 = 27

25. Write the rule used to identify the direction of the following.

A] Magnetic field around the current carrying straight conductor.

B] Current carrying straight conductor placed perpendicular to the magnetic field.

C] Induced current in the coil rotating in the magnetic field.

Ans:A). Right hand thumb rule

B). Flemings left hand rule

C). Faraday's Law

26. Explain the structure and function of nephron. OR

Explain the structure and functions of the stomata.

Ans: Structure and Function of nephron

A nephron is the basic structural and functional unit of Kidney.

Structure: Nephron starts from the cup shaped structure called Bowmen's capsule which contain a net of capillaries called glomerules. The extension of the Bowmen's capsule is called tubular part of nephron which contains a U shaped loop called the loop of Henle. This tubular part of nephron then connects to the collecting ducts.

Function The main function of nephron is filtration of blood. It filters substances like glucose, amino acids, salts, components of blood etc. A major amount of water are selectively reabsorbed as the urine flows along the tube. The amount of water reabsorbed depends on how much excess water is there in the body, and how much of dissolved waste there is to be excreted. Nitrogenous waste such as urea or uric acid are removed from blood in the kidneys.

OR

Structure and function of stomata:

Structure: Stomata are tiny openings or pores in plant tissue that allow for gas exchange. Stomata are typically found in plant leaves but can also be found in stems. Specialized cells surround stomata and function to open and close stomatal pores.

Functions: Massive amount of gaseous exchange takes place in the leaves through these pores for the purpose of photosynthesis. Opening and closing of the pore is a function of the guard cells. The guard cells swell when water flows into them, causing the stomatal pore to open. Similarly the pore closes if the guard cells shrink.

27 . A] What is the reason for the formation of food webs in an ecosystem ?

B] Differentiate the biodegradable and non – biodegradable substance with examples for each.

Ans:A) A food web is the natural interconnection of food chains and a graphical representation of what eats what in an ecosystem. Food webs shows the mutual dependency of species and the natural

balance of habitats that sustain animal and plant life. Food webs are important tools in understanding that plants are the foundation of all ecosystems and food chains, sustaining life by providing nourishment and oxygen needed for survival and reproduction.

B)

BIODEGRADABLE SUBSTANCES	NON BIODEGRADABLE SUBSTANCES
Decomposed by Micro organisms	Not decomposed by Micro organisms
Do not cause bio magnification	Cause Bio magnification
Ex: Kitchen waste, paper, Sewage	Ex:Plastic, metal cans, glass, Polymers

28] 28. Three resistors 5Ω , 10Ω , 30Ω are connected in parallel with 12V battery. Calculate

A] Current through each resistor

B] Total current in the circuit

C] The total circuit resistance .

Ans :

$R_1=5\Omega$, $R_2= 10\Omega$ and $R_3= 30\Omega$, Potential Difference across the battery $V = 12 V$

This is also the potential difference across each of the individual resistor, therefore to

Calculate the current in the resistors, we use Ohm's law

The Current I_1 , through $R_1 = \frac{V}{R_1}$

$$I_1 = 12 V / 5 \Omega = 2.4 A$$

The current I_2 , through $R_2 = \frac{V}{R_2}$

$$I_2 = 12V/10 \Omega = 1.2 A$$

The current I_3 , through $R_3 = \frac{V}{R_3}$

$$I_3 = 12V/30 \Omega = 0.4 A$$

The total current in the circuit.

$$I = I_1 + I_2 + I_3$$

$$= (2.4 + 1.2 + 0.4)A$$

$$= 4A$$

The total resistance R_p is given by

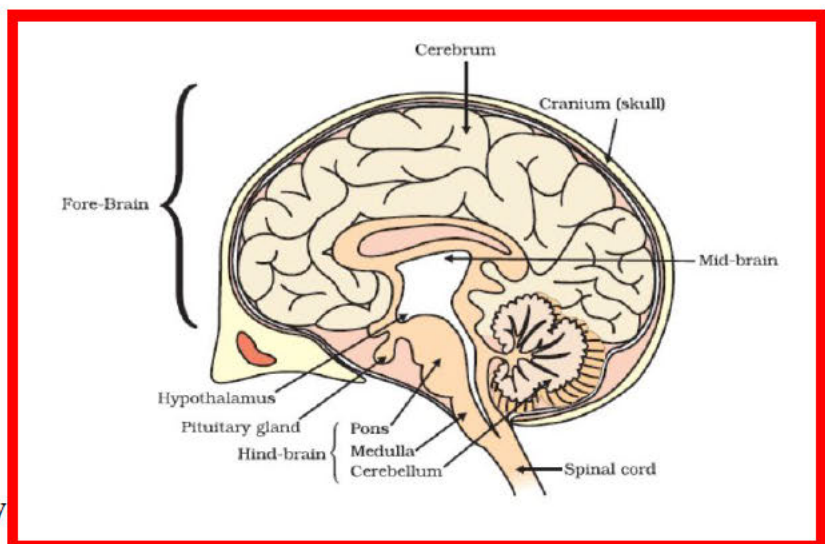
$$\frac{1}{R_p} = \frac{1}{5} + \frac{1}{10} + \frac{1}{30} = \frac{1}{3}$$

$$\text{Thus } R_p = 3 \Omega$$

29. Draw the diagram of human brain

and label the following parts.

A] Pons B] Cerebrum



30. You are given aluminium oxide, Sodium hydroxide and zinc metal. Using these chemicals

A] How do you prepare hydrogen gas?

B] How do you show that aluminium oxide is an amphoteric oxide .

Ans:A): When zinc reacts with sulphuric acid Hydrogen gas is produced.



B] Metal oxides which reacts with both acids as well as bases to produce salt and water are Known as amphoteric oxides.

Aluminium oxides reacts with both acids and bases .



31. Mention the factors on which resistance of a conductor depends. Write the corresponding equation.

The resistance of a conductor depends on

i] Its length [ii] Its area of cross section. [iii] Nature of its material.

$$R = \rho \frac{l}{A}$$

R = resistance ρ = rho-resistivity l = length A = area of cross section.

32. Draw the diagram of the arrangement of apparatus to show the action of steam on a metal. And label the part.

33. write the products and physical state when heating the crystals of ferrous sulphate. Name

The type of chemical reaction and write the balanced chemical equation.



Ferrous sulphate Ferric oxide

Products : Ferric Oxide , Sulphur di oxide , sulphur trioxide

DECOMPOSITION REACTION.

OR

When reddish brown copper powder is heated in a China dish it turns in to black colour substance

A] Name the black substance formed.

B] Write the chemical equation for the above reaction.

C] How can black coating of copper be turn in to brown ?

A. Black substance ----- copper [II] oxide CuO



C] When hydrogen gas is passed over heated copper [II] oxide [CuO]

The black coating on the surface turns brown as the reverse reaction takes place and Copper is obtained .



V Answer the following questions.

34. Identify the false statement and make them correct.

4 x 4 = 16

a. If the sugar levels in blood reduced, they are detected by the cells of the pancreas.

Ans: False If the sugar level in blood reduced they are detected by the hormone called Glycogen released by pancreas.

b. The changes seen in girls at the time of puberty are because of the secretion of testosterone.

Ans: False :: The changes seen in girls at the time of puberty are because of the secretion of Oestrogen .

c. If there is a deficiency of hormones secreted by pituitary gland leads to dwarfism.

Ans:: True ::

d. The animal body to be ready to deal with the situation enable the hormones secreted by upper part of the body.

Ans:- False The animal body to be ready to deal with the situation enable the hormones secreted by adrenal gland located above the kidneys .

ii] Given any two examples for movement due to growth in plants and how is this movement different from movements of leaves of the sensitive plant.

Ans: - Movement due to growth in plants

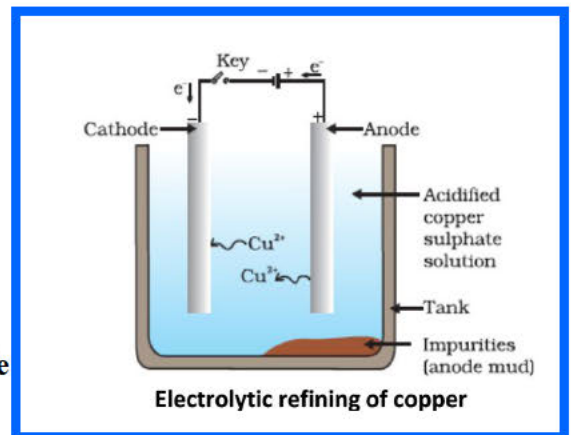
Ex:- [1] Pea plant climb up other plants are fences by means of tendrils ,

[2] Shoot of the plant grow towards light.

[3] Root of the plant grow towards soil and water.

The movement of leaves of the sensitive plants Mimosa Pudica or touch me not occurs

In response to touch or contact stimuli. This movement is independent of growth.



The movement of shoot towards light is known as Photo tropism. This type of movement is Directional and is growth independent .

35] [I] What is double circulation? Describe the steps of this process.

Animals	Approximate rate of respiration
A	200 /min
B	300/ min

Identify the aquatic and terrestrial animals. Justify your answer with scientific reasons.

Ans: Blood goes through the heart twice during each cycle in human beings . This is known As double circulation.

Steps:

[a] Deoxygenated blood enters the heart through upper and lower venacava into the right Atrium

[b] When right atrium contracts deoxygenated blood flows to right ventricle then

[c] then the right ventricle contracts and passes the deoxygenated blood to the lungs where The blood becomes oxygenated

[d] From the lungs the pulmonary veins transport the oxygenated blood the left atrium

[e] When the left atrium contracts the oxygenated blood enters the left ventricle .

[f] The aorta carries the oxygenated blood from the left ventricle to all the regions of the Body.

[ii] A - Terrestrial Animal

B - A quatic animal

Terrestrial animals can breathe the oxygen in the atmosphere, but animals that live in Water need to use the oxygen dissolved in water. Since the amount of dissolved oxygen is Fairly low compared to the amount of oxygen in the air , the rate of breathing in aquatic Organisms is much faster than that seen in terrestrial organisms.

36. I] Write the two uses of Plaster of Paris and why it should be stored in a moisture proof Container ?

II] Metallic Carbonate “ A ” reacts with hydrochloric acid to form sodium Compound And liberate “ B ” gas . “ B ” reacts with slaked lime and form “ C ” Identify A, B and C. Write suitable chemical equation .

Ans: Uses of plaster of paris :

A] Doctors use as plaster for supporting fractured bones in the right position.

B] making toys

C] materials for decoration

Plaster of paris should be stored in air tight container because air contains moisture. Can Cause the setting of plaster of paris into hard mass gypsum.

II] Ans :

A \longrightarrow Sodium carbonate Na_2CO_3

B \longrightarrow Carbon di oxide gas CO_2 .

C Calcium carbonate.

$\text{Na}_2\text{CO}_3 + 2\text{HCL} \longrightarrow 2\text{NaCl} + \text{H}_2\text{O}$

Sodium carbonate Hydrochloric acid Calcium Carbonate water.

$\text{Ca(OH)}_2 (\text{aq}) + \text{CO}_2 (\text{g}) \longrightarrow \text{CaCO}_3 (\text{s}) + \text{H}_2\text{O} (\text{l})$

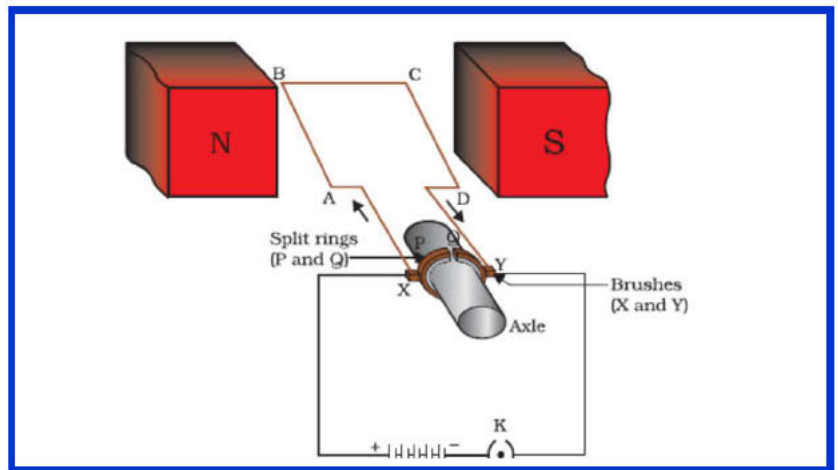
Lime water Carbon di oxide Calcium carbonate water

37. Draw a neat labelled diagram of DC motor.

Write any two uses of it.

Uses:

A] Fan, Mixi , washing machine etc.,



38. There are two strings made up of iron and silver of same thickness. Length of iron string is 6cm

Find the length of silver wire whose resistance equal to resistance of the iron wire.

(Resistivity of the iron is 10×10^{-8} and resistivity of silver is 1.6×10^{-8})

Ans:-

l_1 = Length of Iron = 6cm

l_2 = Length of silver = ?

ρ_1 = resistivity of Iron = 10×10^{-8}

ρ_2 = resistivity of Silver = 1.6×10^{-8}

$$L \propto S \quad \frac{l_2}{l_1} = \frac{\rho_1}{\rho_2}$$

$$\frac{l_2}{6} = \frac{10 \times 10^{-8}}{1.6 \times 10^{-8}}$$

$$l_2 = \frac{10 \times 6}{1.6} = \frac{60}{1.6} = \frac{600}{16} \quad l_2 = 37.5\text{cm}$$

Cross verification

$$\frac{l_2}{l_1} = \frac{\rho_1}{\rho_2}$$

$$= \frac{10 \times 10^{-8}}{1.6 \times 10^{-8}}$$

$$= \frac{37.5}{6}$$

6.25