CBSE Class 10 Science

Sample Paper-11

General Instructions:

i. The question paper comprises two sections, A and B. You are to attempt both the sections.
ii. All questions are compulsory.
iii. All questions of Section A and B are to be attempted separately.
iv. There is an internal choice in two questions of three marks each and one question of five marks.
v. Question numbers 1 and 2 in Section-A are one mark question. They are to be answered in one word or in one sentence.
vi. Question numbers 3 to 5 in Section- A are two marks questions. These are to be answered in 30 words each.
vii. Question numbers 6 to 15 in Section-A are three marks questions. These are to be answered in about 50 words each.
viii. Question numbers 16 to 21 in Section-A are 5 marks questions. These are to be answered in 70 words each.
ix. Question numbers 22 to 27 in Section- B are based on practical skills. Each question is a two marks question. These are to be answered in brief

Section A

1. Which sodium compound is used as on antacid in medicine.
2. Give the function and source of Insulin hormone.
3. What do you observe when penta hydrated copper-Sulphate crystals are heated? Give reaction also.
4. Name the unit of inheritance. Write its functions.
5. What will be the amount of energy available to the organism of the 2nd trophic level of a food chain, if the energy available at the first trophic level is 10,000 joules.
6. Four elements P, Q, R and S have atomic numbers 12, 13, 14, 15 respectively.
   Answer the following questions giving reasons:
   a. What is the valency of P.

b. Classify these elements as metals and non metals.
c. Which of these elements will form basic onides.

7. a. Write the chemical names of CH_3 CO CH_3 and C_2H_5 COOH.
   b. What happens when acetic acid and ethanal reacts in presence of concentrated H_2SO_4. Write the chemical equation involved.
8. Write any three advantages of vegetative propagation.
9. Draw a sectional view of human female reproductive system and label the part where:
   a. Eggs develop
   b. Fertilizations take place.
   c. Fertilized egg get implanted.
10. Name the eye defect in which eye lens become cloudy on milky. Name the method for its correction. A person uses a lens of power - 2.0 D for correcting his distant vision and for correcting his near vision he used lens of power + 2.0 D. Calculate the focal length of lenses required to correct these defects.
11. Define the following terms:
    i. Recycling
    ii. Suistainable development
    iii. Chipko Andolan
12. What is the difference between a direct current and an alternating current? How many times does AC used in India change direction in one second?

OR

What is the role of fuse used in series with any electrical appliance? Why should a fuse with defined rating not be replaced by one with a larger rating?

13. Calculate the energy transferred by a 5A current flowing through a resistor of 2 Ohms for 30 minutes.
14. Sahil lives in Delhi and is much concerned about the increasing electricity bill of the house. He look some steps to save electricity and succeeded in doing so:
    i. Mention any two steps that Sahil might have taken to save electricity.
    ii. Which alternative source of energy would you suggest Sahil to use?
15. a. Write the electron-dot structure of Sodium, Oxygen and Magnesium.
    b. Show the formation of MgO by the transfer of electrons.
    c. What are the ions present in these compounds?
16. Draw the ray diagram in each case to show the position and nature of the image formed

when the object is placed:

i. At the centres of curvature of a concave mirror.
ii. Between the pole P and focus F of a concave mirror.
iii. In front of a convex mirror.
iv. At 2F of a convex lens.
v. At infinity in front of a concave lens.

17. i. Draw the pattern of magnetic field lines through and around a current carrying solenoid. What does the magnetic field pattern inside the solenoid indicate?
ii. How can this principle be utilized to make on electromagnet.
iii. State two ways by which strength of this electromagnets can be increased.

18. a. Draw a meat diagram of on excretory unit of human kidney and label the following parts.
i. Bourman's capsule
ii. Renal Artery
iii. Glo merulus
iv. Collecting diut
b. Mention any two functions of the kidney.
c. Mention any two substances which are selectively re absorbed as the filtrate flows along the tubular part of this unit.

19. a. What happens chemically when quick lime is added to water?
b. Balance the following chemical equation:
$MnO_2 + HCl \rightarrow MnCl_2 + Cl_2 + H_2O$
c. What is decomposition reaction? Explain it with suitable example.

OR

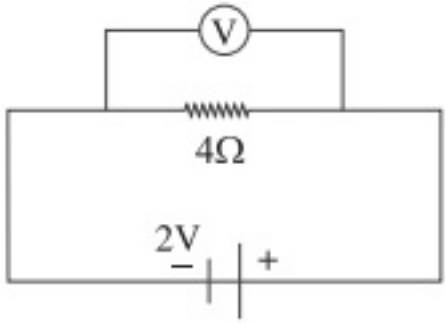
a. Balance the chemical equation:
$Fe\ (s) + H_2O\ (g) \rightarrow Fe_3O_4\ (s) + H_2\ (g)$
b. Identify the type of reaction in the equation given below:
$Na_2SO_4\ (aq) + BaCl_2\ (aq) \rightarrow BaSO_4\ (s) + NaCl\ (aq)$
c. When copper powder is heated in a Cheinadish the surface of copper powder becomes coated with black colour substance:
i. What is that black substance.
ii. Why has this black coloured substance formed.
iii. Write the chemical equation of the reaction take place.

20. a. "Fossils are related to evolution". Justify this statement. Give two ways by which age of fossils can be estimated.
    b. List two difference between acquired trait and inherited trait.
21. Both soap and detergent are some type of salts:
    i. What is the difference between them
    ii. Describe in brief cleaning action of soap
    iii. Draw diagram of a micella
    iv. Why do soaps not form lather in hard water
    v. List any problem that arise due to the use of detergents instead of soap

SECTION -B

PRACTICAL SKILL BASED QUESTIONS)

22. Write the type of reaction and observation that can be made when:
    a. Iron filling are added to copper sulphate solution.
    b. When ferrous sulphate crystals are heated.
23. Calculate the current 'I' in the following circuit:



24. Draw a diagram showing various parts of an embryo of a dicot seed.
25. How does acetic acid react with sodium bicarbonate? Give chemical equation for this chemical change.
26. An object is placed at $2F_1$ in front of a convex lens. What is the-
    a. Portion
    b. Size
    c. Nature of image
    d. Magnification.
27. Mention the observation of budding in Yeast.

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SOLUTION

SECTION-A

1. Sodium hydrogen carbonate is used as an antacid in medicine.
2. Source of Insulin hormone - Pancreas

   Function of Insulin hormone - Metabolism of sugar
3. Blue colour of copper sulphate crystals changes to white-

   $\underset{(Blue)}{CuSO_4 \cdot 5\ H_2O} \xrightarrow[Heat]{} \underset{White}{CuSO_4} + 5\ H_2O$
4. Gene is the unit of inheritance.

   Function : Gene inherits the traits or characters from parents to the off springs.
5. Only 10 percent energy is available from the first trophic level to second trophic level.

   $10,000 \times \frac{10}{100} = 1000J$
6. a. The valency of P is 2 as its valence shell has 2 electrons in it.
   b. Elements P and Q are metals as they have 2 and 3 electrons in their valence shell and they form positively charged ions when as R and S are non metals as they gain electron to complete their oclet.
   c. P and Q will form basic oxides as they are metals.
7. a. $CH_3CO\ CH_3$ – Propanone

      $C_2H_5\ COOH$ – Propanoic acid

   b. Esterification takes place

      $CH_3\ COOH + C_2H_5OH \xrightarrow[H_2SO_4]{Cone} CH_3\ COOC_2H_5 + H_2O$
8. Three advantages of vegetative propagation-
   i. Plants which do not produce viable seeds can be produced this method.
   ii. It is cheap easier and more rapid method of propagations.
   iii. Plants raised by this method can bear flavors and fruits ear line than these produced from seeds.
9.

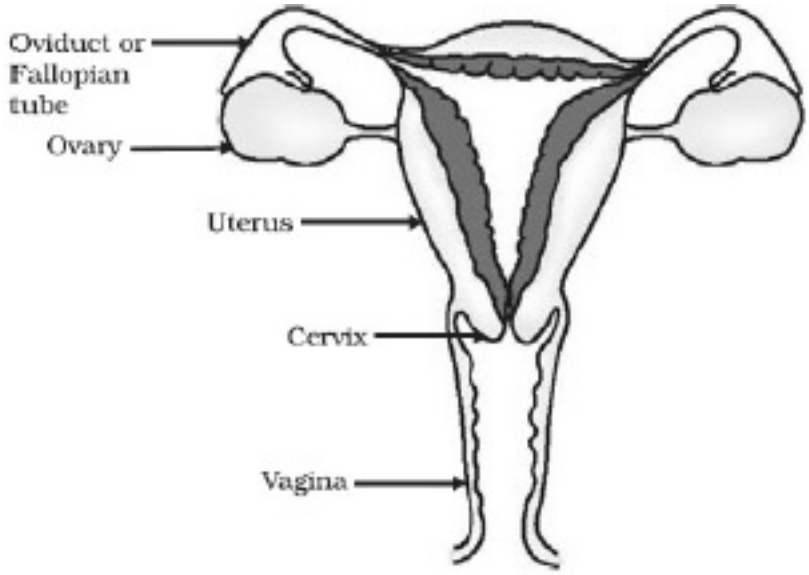


Figure *Human–female reproductive system*

a. Ovaries
b. Fallopian tube
c. Uterus (Correct labelling)

10. Sometimes, the crystalline lens of people at old age becomes milky or cloudy. This condition is called cataract.
    It is possible to restore the vision through cataract surgery.
    Focal length of the lens for distant vision f = $\frac{1}{P} = \frac{-1}{2}$ = -0.5m
    Focal length of the lens for near vision = $\frac{1}{2}$ = +0.5m
11. i. Recycling : The act of processing used or abandoned materials for creating new products.
    ii. Suistainable development : A pattern of resources used for obtaining economic and social growth of the present generation while preserving the resource for the needs of future generation.
    iii. Chipko Andolan : A grass root level movement in which the villagers used to hug the forest trees and prevent their mass felling by the contractors.
12. Correct difference between A/c and DC.
    AC supply in India reverses its direction 100 times in 1 second.

OR

A fuse is a safety device having a short length of a thin, tin plated copper wire having low melting point which melts and breaks the circuit if the current exceeds a safe values the fuse cannot the replaced because then tis purpose will not be solved.

13. $P = I^2 \times R$

I = 5 A

R = 2 Ω ∴ P = $(5)^2 \times 2$

= 50w

$= \frac{50}{1000} kw$

Power = 0.05 kw

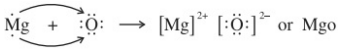
time : 30 minutes = $\frac{30}{60}$ hours

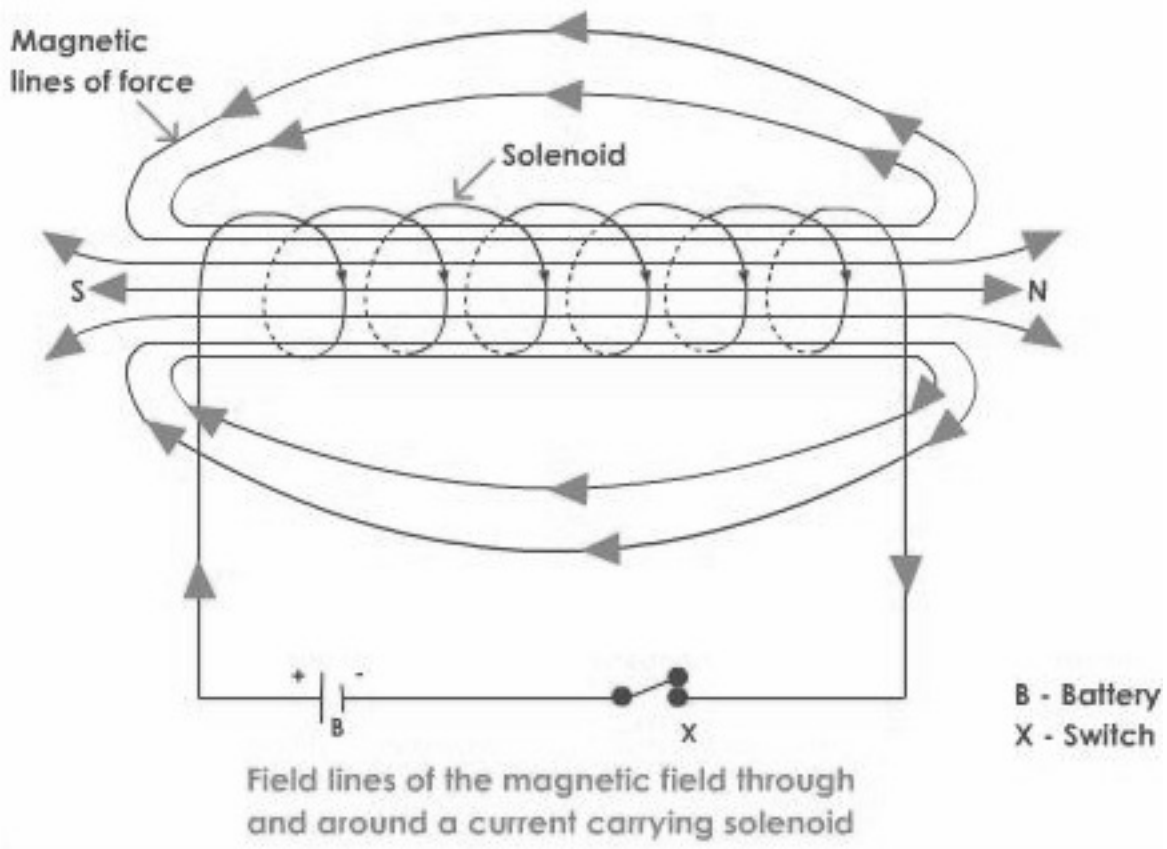
$= \frac{1}{2}$ hours = 0.5 hours

E = P × t

= 0.05 x 0.5

E = 0.025 kwh

14. i. Switch of the lights and fans when not in use. Usage of energy efficient electrical appliances.
    ii. Solar energy.
15. a. $\dot{N}a$, $\ddot{O}$, $\ddot{M}g$
    b.  or Mgo
    c. Mg^{2+} , O^{-2}
16.
17.



Field lines of the magnetic field through and around a current carrying solenoid

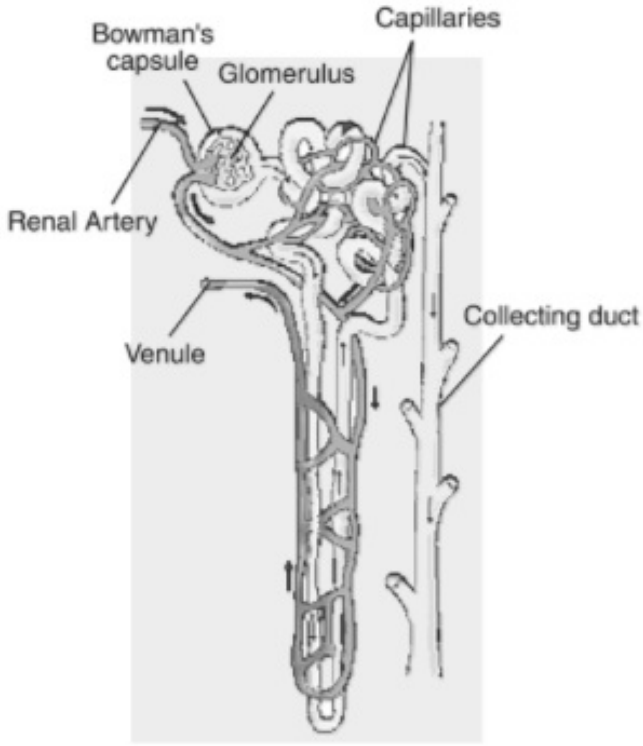
Magnetic field pattern inside the solenoid indicates that the magnetic field is some at all points inside the solenoid. This principle is utilized to magnetize a piece of magnetic material like soft iron when placed inside the coil.

Ways to strengthen the electromagnet:

i. Increase the amount of electric current through it

ii. Increase the number of turns of coil.

18. a. diagram of on excretory unit of human kidney



Uriniferous tubule with its blood vessels

b. Functions of kidney

i. To remove the waste material from the blood.

ii. To keep balance of ions and water content (osmoregulation) inside the body organ.

c. Glucose, amino acids, salts, water (any two)

19. a. $CaO + H_2O \rightarrow Ca(OH)_2$

Calcium hydroxide is formed and hising sound is produced.

b. $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$

c. When a single substance decomposes under suitable conditions to form two or more substances

e.g. : $CaCO_3(s) \xrightarrow{Heat} CaO(s) + Co_2(g)$.

OR

a. $3Fe\ (s) + 4H_2O(g) \rightarrow Fe_3\ O_4(s) + 4H_2(g)$

b. Double displacement reaction

c. i. Black substance is Copper oxide

ii. When copper powder burns with oxygen copper oxide is formed.

iii. $2(Cu\ (s) + O_2(g) \rightarrow 2CuO$ (Black).

20. Preserved traces of the living organisms of the past are called fossils + explanation.

Two ways :

Relative - Fossils closer to the surface are more recent

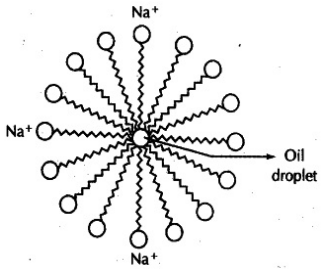
Carbon Dating – Finding the ratio of different isotopes

Acquired trait	Inherited trait
i. Are not passed onto next generation	i. Can be passed on next generation
ii. They cannot direct evolution	ii. They bring about evolution of species.

21. i. Correct difference

ii. Cleansing action of soap

iii.



iv. Correct explanation -

v. Detergents are non-biodegradable hence harm the environment

SECTION – B

(BASED ON PRACTICAL SKILL)

22. a. Displacement reaction:

Observation : Blue coloured copper sulphate solution turns green Redding brown coat deposited on iron-fillings.

b. Decomposition reaction :

Observation : Green colour of ferrous-sulphate crystals changes.

23. According to Ohm's Law V = IR

$I = \frac{V}{R}$

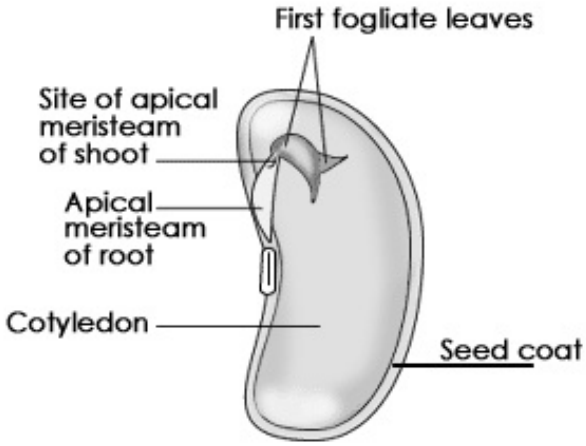
V = 2V

R = 4Ω

$I = \frac{2}{4} = \frac{1}{2} = 0.5A$

24.

Dicot Seed



25. $CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + H_2O + CO_2$

CO_2 gas is evolved which turns lime water milky.

26. Position of Image = At $2F_2$

Size of Image = Same size as that of the object

Nature of image = Real and inverted

Magnification = $m = \frac{v}{u} = \frac{-h_2}{h_1} = -h_2 = h_1$

= –1

27. Budding in Yeast:
    i. A small protuberance arises from parent lody called bud
    ii. Nucleus divides to form two daughter nucleic, of which one passes into the bud.
    iii. The bud now detaches from the parent body and graves in dependently as a new individual or may remain attached to the parent body, forming chain of cells.
    iv. Parental identity is not last.