RBK GLOBAL SCHOOL
REACH BEYOND KNOWING

RBK Global School
A CBSE School
Managed by Babubhai Kanakia Foundation
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PRELIMINARY EXAMINATION II (2019-20)
SUBJECT: SCIENCE

GRADE: X
Time: 3 Hours

Date : 10/01/20
Max Marks: 80

General Instructions :

(i) The question paper comprises three sections- A, B and C. Attempt all the sections.
(ii) All questions are compulsory.
(iii) All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
(iv) All questions in Section B are three-marks, short-answer type questions. These are to be answered in about 50-60 words each.
(v) All questions in Section C are five-marks, long-answer type questions. These are to be answered in about 80-90 words each.
(vi) This question paper consists of a total of 30 questions.

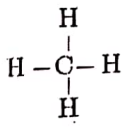
Section A

1 Identify the oxidising agent and the substance oxidised in the following reaction.
$CuO + H_2 \rightarrow Cu + H_2O$

2 Why is sodium kept immersed in kerosene oil?

3 Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.

The compounds entirely consisting of carbons and hydrogens are known as hydrocarbons. There are different categories in which hydrocarbons are divided out of which the two are :
Saturated Hydrocarbons: The hydrocarbons having only sing bonds between the carbon atoms are called saturated hydrocarbons. The include alkanes having a general formula C_nH_{2n+2}. The first member of the homologous series of alkanes is methane (CH_4). Structure of methane is as follows:



Unsaturated Hydrocarbons: The hydrocarbons having double and triple bonds between the carbons atoms are called unsaturated hydrocarbons. This includes alkanes and alkynes having general formula C_nH_{2n} and C_nH_{2n+2}, respectively. The first member of the homologous series of alkenes is Ethane. The structure of ethane is as follows: $H_2C{=}CH_2$.
The first member of the homologous series of alkynes is Ethyne C_2H_2 having structural formula $HC \triangleq CH$.

3.1 Select alkenes and alkynes from the following:
C_2H_4, C_3H_4, C_2H_2, C_4H_8

3.2 Name the reaction used to convert saturated hydrocarbons to unsaturated hydrocarbons.

3.3 Name the catalyst used in the above conversion reaction.

3.4 Draw the structure of hydrocarbons with general formula C_nH_{2n-2} where n = 3.

4 Answer question numbers 4.1-4.4 on the basis of your understanding of the following paragraph and the related studied concepts. Bio-mass, a fuel developed from organic materials, is a renewable and sustainable source of energy used to create electricity or other forms of power. It includes wood, cow-dung and crop residues. In villages, women still use dried cow-dung cakes as fuel to cook food and for heating purposes. Burning of cow-dung cakes as fuel produces a lot of smoke and also destroys nutrients such as nitrogen and phosphorus.

4.1 Name the smokeless fuel that can be prepared from the cow-dung.

4.2 'Cowdung cakes have low calorific value'. What is meant by this statement?

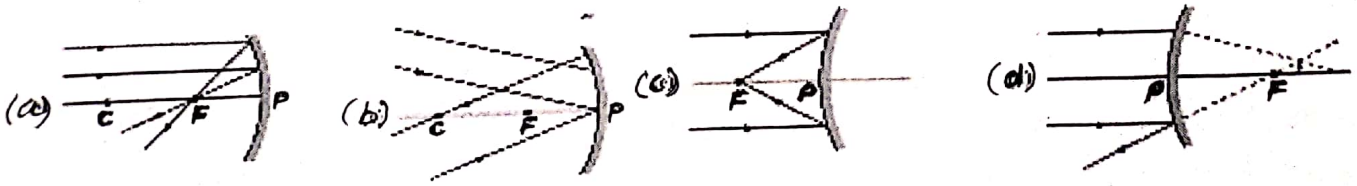
4.3 Which of the following statements is correct about bio-mass?
(a) It converts chemical energy into kinetic energy.
(b) It is a renewable source of energy.
(c) It is the inorganic matter used as fuel.
(d) It is an organic matter produced by plants only

4.4 Which of the following are examples of biodegradable wastes?
(a) Plastic and cow-dung cakes
(b) Cow-dung cakes and vegetable peels
(c) Plastic and rubber
(d) Glass and the cow-dung cakes

5 Consider the following statements with regard to the periodic classification of elements.
A. In the Modern Periodic Table, the isotopes of an element having different mass numbers are put at one place in the same group.
B. Elements in Mendeleev's Periodic Table are arranged on the basis of increasing atomic numbers. C. Elements in the Modern Periodic Table are arranged on the basis of increasing mass numbers.
D. In the Modern Periodic Table, the nickel of a lower mass number is kept after cobalt of a higher mass number. The correct statements are
(a) A and B (b) B and C (c) C and D (d) A and D

6 In human beings, 23 pairs of chromosomes are present in each cell. The number of chromosomes in each sex cell of a human being (male or female) is most likely to be
(a) 23 (b) 22 (c) 21 (d) 44

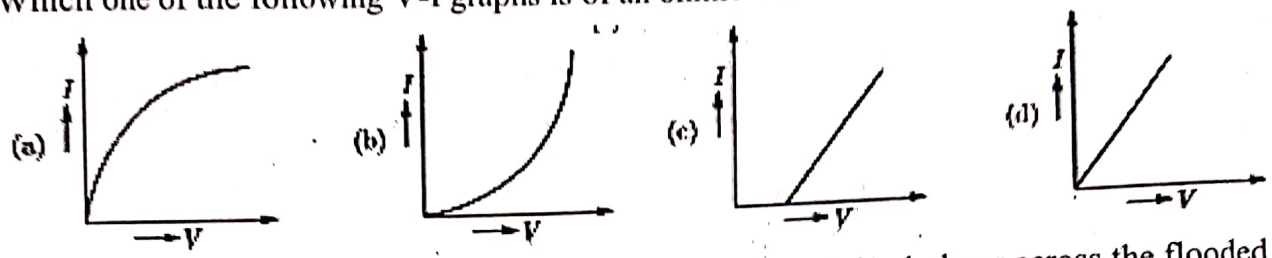
7 Which of the following ray diagrams depicts correctly the path of a parallel beam of light after reflection from a spherical mirror?



8 When lead nitrate reacts with potassium iodide, a yellow precipitate is formed. This yellow compound formed is

(a) $Pb(NO_3)_2$ (b) KNO_3 (c) PbI_2 (d) PbO

9 Which one of the following V-I graphs is of an ohmic conductor?



10 Read the following statements regarding the construction of check dams across the flooded gullies.

A. Check dams hold water for irrigation.

B. Check dams recharge groundwater.

C. Check dams hold water and increase soil erosion.

D. Check dams hold water permanently.

The correct statement(s) is/are

(a) only A (b) only B (c) only B and C (d) A, B and C

11 When ethanoic acid is added to sodium hydrogen carbonate, a gas evolves. Which of the following statements is correct about the evolved gas?

A. It has a pungent smell.

B. It turns lime water milky.

C. It extinguishes a burning splinter.

D. It dissolves in a solution of sodium hydroxide.

(a) A, B and C (b) B, C and D (c) B and C only (d) B and D only

12 Magnification produced by a rearview mirror fitted in vehicles

(a) is less than one.

(b) is more than one.

(c) is equal to one.

(d) can be more than or less than one depending upon the position of the object.

For question numbers 13 and 14, two statements are given—one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

(a) Both A and R are true and R is the correct explanation of the assertion.

(b) Both A and R are true but R is not the correct explanation of the assertion.

(c) A is true but R is false.

(d) A is false but R is true.

13 Assertion : Dentists use concave mirrors to observe the magnified images of the patient's teeth.
Reason : A concave mirror produces a real and magnified image of the object placed between its pole and focus.

14 Assertion : Wires used in heater elements should have high resistivity and a high melting point.
Reason : Heater wires are made of an alloy having resistivity higher than that of its constituent metals.

Section B

15 Write a balanced chemical equation with the symbols for the following reactions:
(a) Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.
(b) Sodium hydroxide solution (in water) reacts with a hydrochloric acid solution (in water) to produce sodium chloride solution and water.

16 (a) What is a hydrated salt?
(b) Give two examples of hydrated salt which are white and state their chemical formula.

17 Write the main aim of classifying elements. Which basic property of the elements is used in the development of the Modern Periodic Table? On which side of this periodic table may we find the metals, non-metals, and metalloids?

18 List four characteristics of plant hormones. Name any two plant hormones.

19 (a) Draw the structure of the neuron and label the cell body and axon.
(b) Name the part of a neuron (i) where information is acquired; (ii) through which information travels as an electrical impulse.

20 Mendel, in one of his experiments with pea plants, crossed a variety of pea plants having round seeds with one having wrinkled seeds. Write Mendel's observations giving reasons of F1 and F2 progeny of this cross. State any two contrasting characters, other than roundness of pea plants, that Mendel used in his experiments.

21 Mention the components of the transport system in highly organized plants. State the functions of these components.

22 (a) What do you mean by dispersion of light?
(b) Draw a ray diagram to show the path of a light ray that enters the glass prism obliquely. Label on it, the angle of incidence and angle of deviation.

23 Draw a labeled diagram of an electric motor and state the principle of its working.

24 (a) What is the total resistance of n resistors each of resistance 'R' connected in:
(i) series (ii) parallel
(b) Calculate the resultant resistance of 3 resistors 3ohm, 4ohm and 12ohm connected in parallel.

Section C

25 Name an ionic compound and write its formula. Explain the formation of this compound by drawing electronic structures of the metal and non-metal involved. List four properties of an ionic compound.

26 (a) What is esterification? Give one chemical equation.
(b) What happens when an ester is treated with a sodium hydroxide solution? State the name of this reaction.
(c) Differentiate between the addition reaction and substitution reaction shown by hydrocarbons.

27 Write in tabular form the functions of the following digestive glands in the human body. Also, state the name and function of the substances secreted.
(i) salivary glands, (ii) gastric glands, (iii) liver (iv) pancreas and (v) intestinal glands

28 (a) What is DNA copying? State its importance in the reproduction of sexually reproducing organisms.
(b) Distinguish between a gamete and zygote. Explain their roles in sexual reproduction.

29 The distance between the object and its inverted image formed by a concave mirror is 15 cm. If the magnification produced by the mirror is –2, use mirror formula to determine the object distance, image distance and focal length of the mirror. Draw a ray diagram to illustrate the image formation in this case and also mark these distances.

30 (a) Derive an expression for the equivalent resistance of three resistors R1 , R2 and R3 connected in series.
(b) Fuse of 3 A, 5 A and 10 A are available. Calculate and select the fuse for operating an electric iron of 1 kW power at 220 V line.