

CLASS X (2019-20)
SCIENCE (CODE 086)
SAMPLE PAPER-15

Time : 3 Hours

Maximum Marks : 80

General Instructions :

- (i) The question paper comprises of three sections-A, B and C. Attempt all the sections.
 - (ii) All questions are compulsory.
 - (iii) Internal choice is given in each sections.
 - (iv) 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.
 - (v) All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50-60 words each.
 - (vi) All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80-90 words each.
 - (vii) This question paper consists of a total of 30 questions.
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SECTION A

Q1. A student suffering from an eye defect uses lenses of power -0.2 D. Name the defect of vision he is suffering from and the nature of the corrective lens used. [1]

Q2. A compound which is prepared from gypsum has the property of hardening when mixed with the right quantity of water. Identify the compound and write its chemical formula. [1]

Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**

Today, our eating habits are different from those of a generation ago in every way. Fast foods, takeaways and eating out are parts of our modern lifestyle. Several studies have shown that the lifestyle adopted by a majority of the youth is extremely disorganised and unhealthy. For them, time is money and corporate and personal ambitions are more important than their health.

It is unfortunate that young people are ignorant towards the fact that smoking, consuming calorie-rich food, alcohol and drugs can eventually lead to serious health issues.

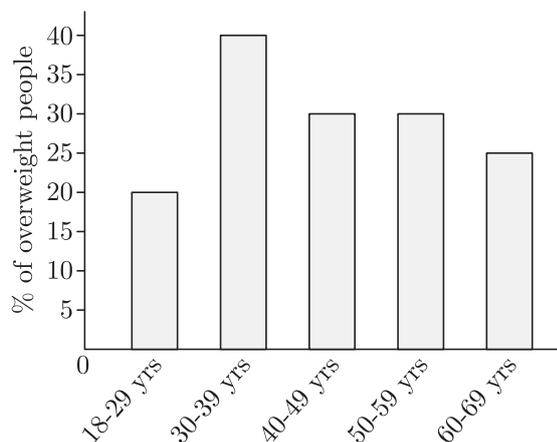
Being physically inactive and disinterested will, at the end of the day, negatively effect the quality of their lives and limit their capabilities.

3.1 Which is the most common health problem that people have because of modern lifestyle? [1]

3.2 Name the organ which gets badly affected by smoking cigarette. [1]

3.3 "Calorie-rich food increases cholesterol level which can lead to various cardiovascular diseases." Justify this statement. [1]

3.4 Based on the data shown below, find out which age group has the maximum number of overweight people. Why? [1]



Q4. 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 a fuel to cook food and for heating purposes. Burning of cow-dung cakes as fuel produces a lot of smoke and also destroys the nutrients such as nitrogen and phosphorus.

4.1 Name the smokeless fuel that can be prepared from the cow-dung. [1]

4.2 'Cowdung cakes have low calorific value'. What is meant by this statement? [1]

4.3 Which of the following statements is correct about bio-mass? [1]

- (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? [1]

- (a) Plastic and cow-dung cakes
- (b) Cow-dung cakes and vegetable peels
- (c) Plastic and rubber
- (d) Glass and the cow-dung cakes

Q5. Which of the following statement is incorrect for atomic size? [1]

- (a) Atomic size of B > Be
- (b) Atomic size of Be > B
- (c) Atomic size of N > O
- (d) Atomic size of C > N

OR

Which of the following property increases down the group?

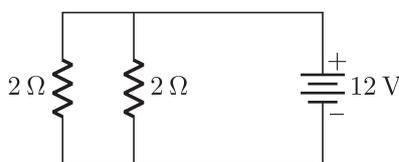
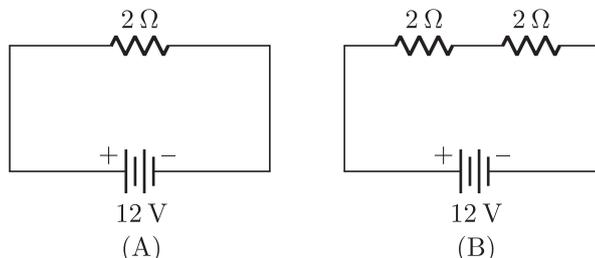
- (a) Electro-negativity
- (b) Electro-positive nature of element
- (c) Atomic size
- (d) Both (b) and (c)

Q6. When ciliary muscles are relaxed the eye lens is [1]

- (a) thick and its curvature is maximum
- (b) thick and its curvature is minimum
- (c) thin and its curvature is minimum
- (d) thin and its curvature is maximum

- Q7. Oily and fatty food items are flushed with nitrogen gas because [1]
 (a) nitrogen reacts with oils and fats and thus prevents oxidation.
 (b) nitrogen is an inert gas and does not react with oily and fatty food items.
 (c) nitrogen helps in the decomposition of food items and makes them tasty.
 (d) nitrogen is 79% of the atmospheric air.

- Q8. In the given circuits A, B and C, the heat produced in the resistor or combination of resistors connected to a 12 V battery will be [1]



(C)

- (a) minimum in A. (b) maximum in B.
 (c) maximum in C. (d) the same in all.

OR

Two bulbs have the following ratings: [1]

40 W, 220 V

20 W, 100 V

The ratio of their resistance is

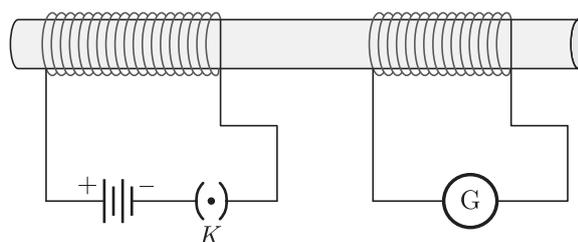
- (a) 1:2 (b) 2:1
 (c) 1:1 (d) 1:3

- Q9. The electronic configurations which corresponds to an alkali metal is [1]
 (a) 2, 2 (b) 2, 8, 7
 (c) 2, 8, 1 (d) 2, 8, 8

- Q10. A common type of bifocal lens consists of both concave and a convex lenses and it is used to correct presbyopia. In a bifocal lens the [1]
 (a) upper portion is a convex lens which facilitates distant vision.
 (b) lower portion is a convex lens which facilitates distant vision.
 (c) lower portion is a convex lens which facilitates near vision.
 (d) upper portion is a concave lens which facilitates near vision.

- Q11. Milk of magnesia is a mild base and it is used as a medicine for indigestion. This chemical is [1]
 (a) magnesium oxide
 (b) magnesium sulphate
 (c) magnesium hydroxide
 (d) magnesium chloride

- Q12. In the arrangement shown in the figure given alongside, there are two coils wound on a non-conducting cylindrical rod. Initially the key is not inserted. Then the key is inserted and later removed. In this case [1]



- (a) the deflection in the galvanometer remains zero throughout.
 (b) there is a momentary deflection in the galvanometer but it dies out shortly and there is no effect when the key is removed.
 (c) there are momentary galvanometer deflections that die out shortly; the deflections are in the same direction.
 (d) there are momentary galvanometer deflections that die out shortly; the deflections are in opposite directions.

For question numbers 13 and 14, two statements are given—one labelled Assertion (A) and the other labelled 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 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.

- Q13. **Assertion :** Sodium hydrogen-carbonate is an acidic salt.

Reason : The pH of aqueous solution of sodium hydrogen-carbonate is more than 7.0. [1]

- Q14. **Assertion :** A point object is placed at a distance of 26 cm from a convex mirror of focal length 26 cm. The image will not form at infinity.

Reason : For above given system the equation $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$ gives $v = \infty$. [1]

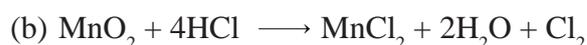
OR

Assertion : An object is placed at a distance of f from a convex mirror of focal length f , its image will form at infinity.

Reason : The distance of image in convex mirror can never be infinity.

SECTION B

- Q15. What is a redox reaction? Identify the substance oxidised and the substance reduced in the following reactions: [3]



- Q16. Write the chemical formula of bleaching powder and the balanced chemical equation involved in its preparation. List its three different uses. [3]

- Q17. Write the number of groups and periods in the Modern Periodic Table. How do the atomic size and metallic character of elements vary as we move down a group and from left to right in a period? [3]

OR

The atomic number of an element A is 13. Write the electronic configuration of A and on the basis of this configuration, determine the group number and period number of the element A. If the element A reacts with another element B of electronic configuration 2, 8, 7 to form a compound, write the formula of the compound formed. [3]

- Q18. (a) How is the brain protected from injury and shock?
(b) Name two main parts of the hind-brain and state one function of each. [3]
- Q19. Explain how the human body responds when adrenaline is secreted into the blood. [3]
- Q20. With the help of suitable examples, explain why certain experiences and qualifications earned by an individual during his lifetime are not passed on to the next generations. What are such qualifications (traits) called? [3]

OR

What is homology between forelimbs of frogs, lizards and wings of birds? What does it indicate? State one function each of forelimbs of (a) human beings and (b) birds. [3]

- Q21. What is the cause of dispersion of white light passing through a glass prism? Draw a ray diagram to show the path of light when two identical glass prisms are arranged together in inverted position with respect to each other and a narrow beam of white light is allowed to fall obliquely on one of the prisms. [3]
- Q22. (a) Write the principle of working of an electric motor.
(b) Explain the function of the following parts of an electric motor. [3]
(i) Armature
(ii) Brushes
(iii) Split ring

OR

- (a) What is the function of earth wire in electrical instruments?
(b) Explain what is short circuiting in an electric supply.
(c) What is the usual current rating of the fuse wire in the line to feed
(i) Lights and fans?
(ii) Appliances of 2 kW or more power? [3]
- Q23. What is an electromagnet? How can you make an electromagnet in your school laboratory? [3]
- Q24. In the context of conservation of natural resources, explain the terms reduce, recycle and reuse. From among the materials that we use in daily life, identify two materials for each category. [3]

SECTION C

- Q25. Explain the following:
(a) Reactivity of aluminium decreases if it is dipped in HNO_3 .
(b) Carbon cannot reduce the oxides of Na or Mg.
(c) NaCl is not a conductor of electricity in solid state whereas it does conduct electricity in aqueous solution as well as in molten state.
(d) Iron articles are galvanised.
(e) Metals like Na, K, Ca and Mg are never found in their free state in nature. [5]

- Q26. (a) What are hydrocarbons? Name the two categories in which these compounds may be classified.
(b) What are alkanes, alkenes and alkynes? Give one example of each. [5]

OR

Explain the given reactions with the examples

- (a) Hydrogenation reaction
- (b) Oxidation reaction
- (c) Substitution reaction
- (d) Saponification reaction
- (e) Combustion reaction

[5]

- Q27. Draw the diagram of human respiratory system and name and label the following:

- (a) part where air is filtered by fine hair and mucus;
- (b) part which terminates in balloon-like structures;
- (c) balloon-like structures where exchange of gases takes place;
- (d) part which separates chest cavity from abdominal cavity.

[5]

- Q28. Name and explain in brief the four different methods of contraception? [5]

OR

- (a) List three advantages of vegetative propagation.
- (b) What is placenta? Explain its function in humans.

[5]

- Q29. 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. [5]

OR

One half of a convex lens is covered with a black paper. Can such a lens produce complete image of an object placed in front of the lens? Draw a labelled diagram to justify your answer.

A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. If the distance of the object from the lens is 15 cm, calculate the position, nature and size of the image. [5]

- Q30. (a) Derive an expression for the equivalent resistance of three resistors R_1 , R_2 and R_3 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. [5]

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