

Class X 2022-23

Science (086)

Time: 3 Hours

Max. Marks: 80

General Instructions:

1. This question paper consists of 39 questions in 5 sections.
 2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
 3. Section A consists of 20 Objective Type questions carrying 1 mark each.
 4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
 5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
 6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
 7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.
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SECTION-A

Select and write one most appropriate option out of the four options given for each of the questions 1–20.

1. Which of the following is/are correct for diluting acid?



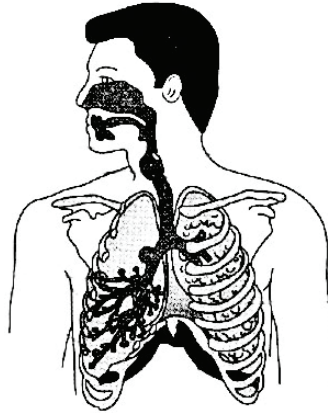
1. Adding acid to water by stirring.
 2. Adding water to acid by stirring.
- (a) Only 1
(b) Only 2
(c) Both 1 and 2
(d) Neither 1 nor 2
2. A solution of substance X is used for white washing. Here X is:
- (a) CaO (b) CaO_2
(c) NaCl (d) KCl

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3. When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained and the sulphuric acid so formed remains in the solution. The reaction is an example of-
- a combination reaction
 - a displacement reaction
 - a decomposition reaction
 - a double decomposition reaction
4. Which of the following are exothermic processes?
- Reaction of water with quick lime.
 - Dilution of an acid.
 - Evaporation of water.
 - Sublimation of camphor (crystals).
- 1 and 2
 - 2 and 3
 - 1 and 4
 - 3 and 4
5. 2 mL each of concentrated HCl, HNO₃ and a mixture of concentrated HCl and concentrated HNO₃ in the ratio of 3 : 1 were taken in test tubes labelled as *A*, *B* and *C*. A small piece of metal was put in each test tube. No change occurred in test tubes *A* and *B* but the metal got dissolved in test tube *C* respectively. The metal could be
- Al
 - Au
 - Cu
 - Pt
6. Which of the following are present in a dilute aqueous solution of hydrochloric acid?
- H₃O⁺ + Cl⁻
 - H₃O⁺ + OH⁻
 - Cl⁻ + OH⁻
 - Unionised HCl
7. Which among the following are unsaturated hydrocarbons ?
- H₃C - CH₂ - CH₂ - CH₃
 - H₃C - C ≡ C - CH₃
 - H₃C - $\underset{\text{CH}_3}{\text{CH}}$ - CH₃
 - H₃C - $\underset{\text{CH}_3}{\text{C}} = \text{CH}_2$
- (i) and (iii)
 - (ii) and (iii)
 - (ii) and (iv)
 - (iii) and (iv)

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8. The respiratory route of air in the respiratory tract of human is :



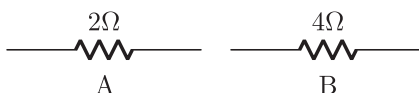
- (a) nostrils → pharynx → larynx → trachea → alveoli.
(b) alveoli → pharynx → larynx → trachea → nostrils.
(c) alveoli → larynx → trachea → pharynx → nostrils.
(d) nostrils → trachea → pharynx → larynx → alveoli.
9. Since the environment is not under the control of the individual organism, the outside source of energy is quite:
- (a) Varied
(b) Same
(c) Differ from case to case
(d) Under the control of organism
10. From the list given below, select the character which can be acquired but not inherited
- (a) colour of eye
(b) colour of skin
(c) size of body
(d) nature of hair
11. Which of the following statements is correct about receptors ?
- (a) Gustatory receptors detect taste while olfactory receptors detect smell.
(b) Both gustatory and olfactory receptors detect smell.
(c) Auditory receptors detect smell and olfactory receptors detect taste.
(d) Olfactory receptors detect taste and gustatory receptors detect smell.

12. Which of the following statements are true for flowers?



- (i) Flowers are always bisexual
 - (ii) They are the sexual reproductive organs
 - (iii) They are produced in all groups of plants
 - (iv) After fertilisation they give rise to fruits
- (a) (i) and (iv)
 - (b) (ii) and (iii)
 - (c) (i) and (iii)
 - (d) (ii) and (iv)

13.

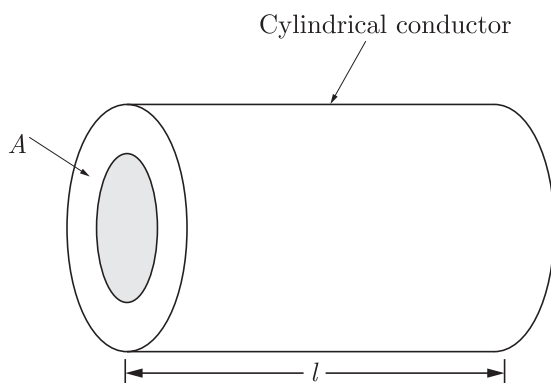


Two resistors are shown in the above figure when it connected to a battery will have

- (a) same current flowing through them when connected in parallel
 - (b) same current flowing through them when connected in series
 - (c) same potential difference across them when connected in series
 - (d) different potential difference across them when connected in parallel
14. For a current in a long straight solenoid N and S -poles are created at the two ends. Among the following statements, the incorrect statement is
- (a) The field lines inside the solenoid are in the form of straight lines which indicates that the magnetic field is the same at all points inside the solenoid.
 - (b) The strong magnetic field produced inside the solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the coil.
 - (c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet.
 - (d) The N and S -poles exchange position when the direction of current through the solenoid is reversed.

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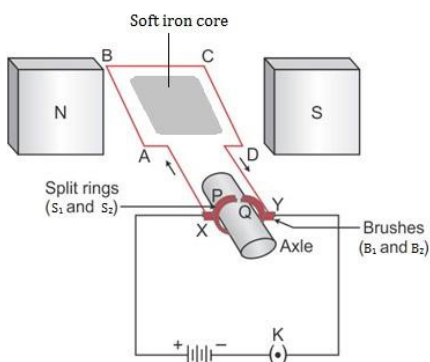
15.



A cylindrical conductor of length l and uniform area of cross-section A has resistance R . Another conductor of length $2l$ and resistance R of the same material has area of cross section

- (a) $A/2$ (b) $3A/2$
(c) $2A$ (d) $3A$

16.



Commercial electric motors do not use

- (a) an electromagnet to rotate the armature
(b) effectively large number of turns of conducting wire in the current carrying coil
(c) a permanent magnet to rotate the armature
(d) a soft iron core on which the coil is wound

Question no. 17 to 20 are Assertion-Reasoning based questions.

17. **Assertion :** A chemical equation should be balanced.

Reason : Number of atoms of each element should be same on reactants as well as products side.

- (a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
(b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
(c) Assertion is True but the Reason is False.
(d) Both Assertion and Reason are False.

18. **Assertion :** DNA finger printing is a method in which polymerase chain reaction followed by DNA probe is used.
Reason : A DNA finger print is inherited and therefore, resembles that of parents.
- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 - Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 - Assertion (A) is true but reason (R) is false.
 - Assertion (A) is false but reason (R) is true.
19. **Assertion :** Carbon monoxide is injurious to the health of the individual.
Reason : Carbon monoxide has very strong affinity for the blood.
- Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - Assertion is true but Reason is false.
 - Both Assertion and Reason are false.
20. **Assertion :** The magnetic field is stronger at a point which is nearer to the conductor and goes on decreasing on moving away from the conductor.
Reason : The magnetic field B produced by a straight current carrying wire is inversely proportional to the distance from the wire.
- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 - Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 - Assertion (A) is true but reason (R) is false.
 - Assertion (A) is false but reason (R) is true.

SECTION-B

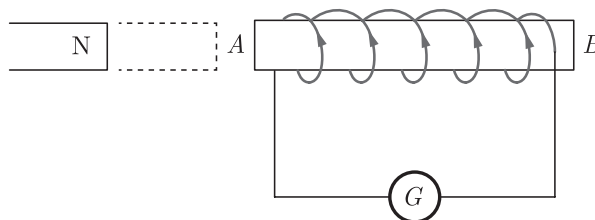
Question no. 21 to 26 are very short answer questions.

21. A metal A , which is used in thermit process, when heated with oxygen gives an oxide B , which is amphoteric in nature. Identify A and B . Write down the reactions of oxide B with HCl and NaOH .
- or**
- In one method of rust prevention, the iron is not coated with anything. Name the method and define it.
22. Why does herbivores have longer small intestine than carnivores ?
23. Do the fresh water animals reabsorb water through their excretory system like marine animal ? Justify your answer.
24. What is translocation ? Why is it essential for plants?
25. What would the sky look if the earth had no atmosphere ? Why ?
- or**
- How do we see colours ?
26. What is ten percent law ? Explain by an example.

SECTION-C

Question no. 27 to 33 are short answer questions.

27. Lead nitrate solution is added to a test tube containing potassium iodide solution.
- Write the name and colour of the compound precipitated.
 - Write the balanced chemical equation for the reaction involved.
 - Name the type of this reaction justifying your answer.
28. Give the reaction involved during extraction of zinc from its ore by
- roasting of zinc ore.
 - calcination of zinc ore.
 - reduction of zinc oxide.
29. (a) Why is vegetative propagation practised for growing some types of plants ?
(b) Name the different parts of a flower that has germ cells.
(c) List any two agents of pollination.
- or**
- List three distinguishing features between sexual and asexual types of reproduction.
 - Explain why variations are observed in the offsprings of sexually reproducing organisms ?
30. The image formed by a spherical mirror is real, inverted and is of magnification -2 . If the image is at a distance of 30 cm from the mirror, where is the object placed ? Find the focal length of the mirror. List two characteristics of the image formed if the object is moved 10 cm towards the mirror.
31. (i) Define optical centre of a spherical lens.
(ii) A divergent lens has a focal length of 20 cm. At what distance should an object of height 4 cm from the optical centre of the lens be placed so that its image is formed 10 cm away from the lens. Find the size of the image also.
(iii) Draw a ray diagram to show the formation of image in above situation.
32. The diagram below shows a coil connected to a center zero galvanometer G . The galvanometer shows a deflection to the right when the N pole of a powerful magnet is moved to the right as shown.
- Explain why the deflection occurs in the galvanometer.
 - Does the direction of current in the coil appear clockwise or anti-clockwise when viewed from end A ?
 - State the observation in G when the coil is moved away from N .
 - State the observation in G when both coil and the magnet, are moved to the right at the same speed.



or

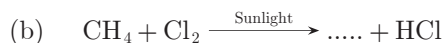
- Draw the magnetic field lines of the field produced due to a current carrying circular loop.
- State the law used to find the direction of magnetic field around a straight current carrying conductor.

33. What do you mean by focal chain ? Give the characteristics of food chain.

SECTION-D

Question no. 34 to 36 are Long answer questions.

34. (I) Complete the following reactions :



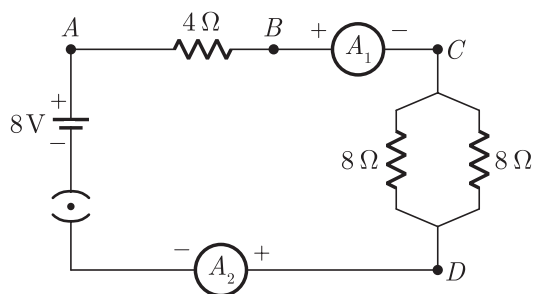
- (II) State two properties of carbon which lead to huge number of carbon compounds we see around us.

or

Answer the following questions :

- (a) Describe a chemical test to distinguish between ethanol and ethanoic acid.
 (b) Give reason for the following :
 (i) Ethanol is used in the preparation of tincture iodine.
 (ii) Ethanoic acid is used in the preservation of pickles.
35. (a) Suggest any two categories of contraceptive methods to control the size of human population which is essential for the prosperity of a country. Also explain about each method briefly.
 (b) Name two bacterial and two viral infections each that can get sexually transmitted.
 (c) List two advantages of using condom during sexual act.
- or
- (i) Describe the role of prostate gland, seminal vesicle and testes in the human male reproductive system.
 (ii) How is the surgical removal of unwanted pregnancies misused?
 (iii) Explain the role of oral contraceptive pills in preventing conception.

36. Find out the following in the electric circuit given in figure :



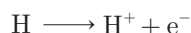
- (a) Effective resistance of two $8\ \Omega$ resistors in the combination.
 (b) Current flowing through $4\ \Omega$ resistor.
 (c) Potential difference across $4\ \Omega$ resistance.
 (d) Power dissipated in $4\ \Omega$ resistor.
 (e) Difference in ammeter readings, if any.

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SECTION-E

Question no. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. The arrangement of metals in a vertical column in the decreasing order of their re-activities is called the reactivity series or activity series of metals. The most reactive metal is at the top position of the reactivity series. The least reactive metal is at the bottom of the reactivity series. Hydrogen, though a non-metal, has been included in the activity series of metals only for comparison. Apart from it, the hydrogen atom also has tendency to lose its valence electron and form cation like the behaviour shown by metals. Thus,



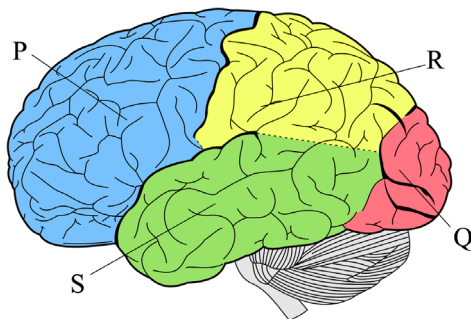
- (i) An element 'X' after reacting with acids liberate hydrogen gas and can displace lead and tin from their salt solution. Write down the Name of X metal.
- (ii) Which metal can be displaced by copper from its salt solution ?

or

- (ii) Write down the name of most reactive metal and which metal does not liberate hydrogen gas after reacting with acid ?

38. The human brain is the command centre for the human nervous system. It receives signals from the body's sensory organs and outputs information to the muscles. The human brain has the same basic structure as other mammal brains but is larger in relation to body size than the brains of many other mammals, such as dolphins, whales and elephants.

The human brain weighs about 3 lbs. (1.4 kilograms) and makes up about 2% of a humans body weight. On average, male brains are about 10% larger than female brains, according to North-western Medicine in Illinois. The average male has a brain volume of nearly 78 cubic inches (1,274 cubic centimetres), while the average female brain has a volume of 69 cubic inches (1,131 cubic cm). The cerebrum, which is the main part of the brain located in the front area of the skull, makes up 85% of the brain's weight.



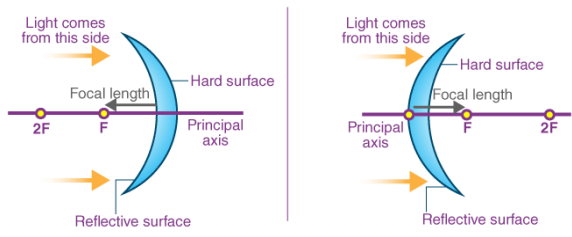
- (i) Name the given figure and identify the labelled part Q and R.
- (ii) Which region is responding for pain and conscious association ?
- (iii) Give two functions of the part 'P'.

or

- (iv) Facial muscular activities and auditory reception are respectively controlled by

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39. Is there a relationship between the radius of curvature R , and focal length f , of a spherical mirror ? For spherical mirrors of small apertures, the radius of curvature is found to be equal to twice the focal length. We put this as $R = 2f$. This implies that the principal focus of a spherical mirror lies midway between the pole and centre of curvature.



- (i) Write relation between radius of curvature and focal length.
 - (ii) For which type of mirrors above relation is verified?
 - (iii) What should be size of the aperture ?
- or**
- (iv) Where is the principle focus of a spherical mirror lies?

□□□□□□