

Sample Question Paper
2020-21 Class X
Science (086) Theory

Time-3 hrs

Marks-80

General Instructions:

The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.

Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.

Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should in the range of 30 to 50 words.

Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.

Section–D – question no. - 34 to 36 are long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.

There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

Wherever necessary, neat and properly labeled diagrams should be drawn.

1. Before burning in air, the magnesium ribbon is cleaned by rubbing with a sand paper. Why?

OR

When ferrous sulphate is heated strongly it undergoes decomposition to form ferric oxide as a main product accompanied by a change in colour. What is the Change in colour? 1

2. Name the gas evolved when dilute HCL reacts with Sodium hydrogen carbonate. How is it recognized? 1
3. Give reason for the following observation:- 1
The element carbon forms a very large number of compounds.

4. What is the commercial unit of electrical energy? Represent it in terms of joules.

OR

State the relation between potential difference, work done and charge moved. 1

5. What is the pattern of field lines inside a solenoid? What do they indicate? 1
6. What is the role of the two conducting stationary brushes in a simple electric motor? 1

7. What does the direction of thumb indicate in the right-hand thumb rule? In what way this rule is different from Fleming's left-hand rule? 1
8. Draw ray diagram showing the image formation by a convex mirror when an object is placed
(a) at infinity 1
- OR
9. Which spherical mirror can give a virtual image larger than the object
How are we able to see nearby as well as the distant objects clearly? 1
10. Blood flows from legs to heart against the gravity through the veins.
Give reasons 1
11. What happens when a planaria gets cut into two pieces? 1
- OR
- List two functions performed by the testis in human beings.
12. Name the cell organelle which take part in cellular respiration. 1
- OR
- What will be the average production of urine by adult human?
13. Name the enzymes involved in the starch digestion in mouth 1

For question numbers 14, 15 and 16, 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 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.

14. **Assertion:** When calcium carbonate is heated, it decomposes to give calcium oxide and carbon dioxide.
Reason: The decomposition reaction takes place on application of heat, therefore, its an endothermic reaction 1
15. **Assertion-**Lungs always contain a residual volume of air. 1
Reason- It provides sufficient time for oxygen to be absorbed and for Carbon dioxide to be released.
- OR
- Assertion-** Diffusion does not meet high energy requirements of multicellular organisms.
Reason- Diffusion is a fast process but only occurs at the surface of the body.
16. **Assertion-** Fertilization is a unique feature in flowers. 1
Reason- It is followed by pollination.

Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.

17. Read the following and answer any four questions from 17 (i) to 17(v).

A food web shows how energy passes from one organism to another in any given ecosystem.

17. (i) Which one of the following food chain exist in a Terrestrial ecosystem?

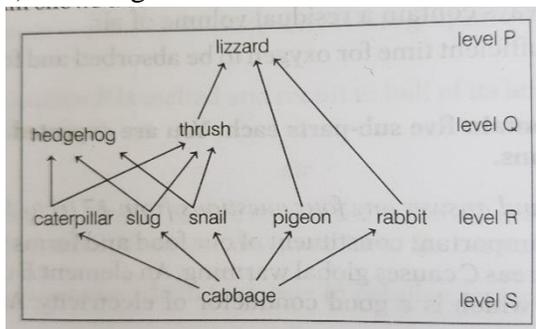
(a) Grass-lion-human 1x4=4

(b) cow-grass-lion

(c) grass-goat-human

(d) leaf-bird-lizard

17. (ii) The diagram shows a food web.



Which levels represent carnivores?

(a) P and Q

(b) Q and R

(c) P and R

(d) R and S

17. (iii) Which of the following describes the flow of energy in an ecosystem:

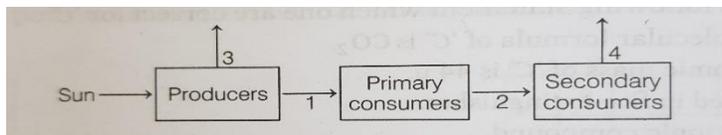
a- heat energy → chemical energy → light energy

b- Heat energy → light energy → chemical energy

c- Light energy → chemical energy → heat energy

d- Light energy → heat energy → chemical energy

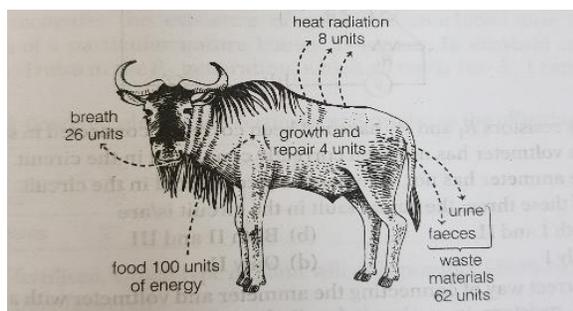
17. (iv) The diagram shows the flow of energy through an ecosystem:



The smallest amount of energy transferred between organisms and the largest amount of energy lost to the ecosystem is represented by which arrows?

	Smallest energy transfer	Largest energy loss
(a)	4	3
(b)	2	1
(c)	2	3
(d)	1	4

17. (v) The diagram shows how energy from food is used by a wild beast. What percentage of this energy is available to consumers and decomposers?



- a- 100
- b- 66
- c- 96
- d- 4

18. Atomic size: Atomic size refers to radius of an atom. It is a distance between the centre of the nucleus and the outermost shell of an isolated atom. 1x4=4

In Period : On moving from left to right in a period, atomic size decreases .

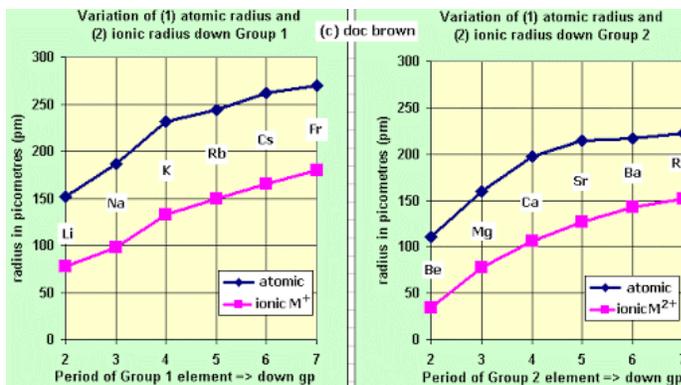
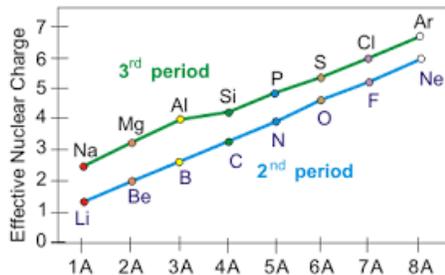
Example: Size of second period elements: $Li > Be > B > C > N > O > F$

Point to know: The atomic size of noble gases in corresponding period is largest.

In Group: Atomic size increases down the group because new shells are being added.

Example ; Atomic size of first group element : $Li < Na < K < Rb < Cs < Fr$

Atomic size of 17th group elements : $F < Cl < Br < I$



18(i) Which among the following gives the correct order of atomic radii of O, F and N?

- a. O,F,N
- b. N, F,O
- c. O , N , F
- d. F, O, N

18(ii) Which among the following elements has the largest atomic radii?

- a. Na
- b. Mg
- c. K
- d. Ca

18(iii) Atomic Size refers to –

- a. Distance from the nucleus to outermost shell.
- b. Distance from nucleus to first shell.
- c. Both of the above
- d. None of the above.

18(iv) The size of atom on moving from left to right in a period in the periodic table-

- a. Increases.
- b. Decreases
- c. First decreases and then increases.

d. None of the above.

18(v) Arrange the following elements in increasing order of their atomic radii-

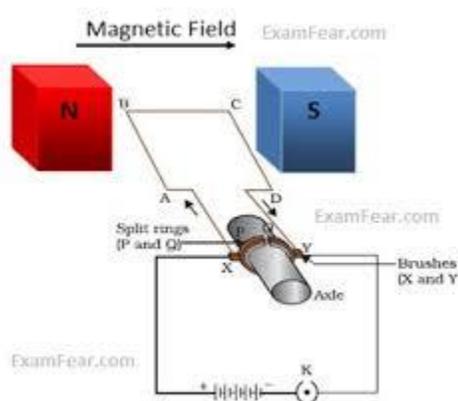
a. Li, Be, N, F

b. Be, Li, F, N

c. F, N, Be, Li

d. N, F, Li, Be

19. Electric motor is a rotating device used for converting electric energy into Mechanical energy. The diagram of electric motor is given below



Write the function of following parts

4

A. Permanent magnet

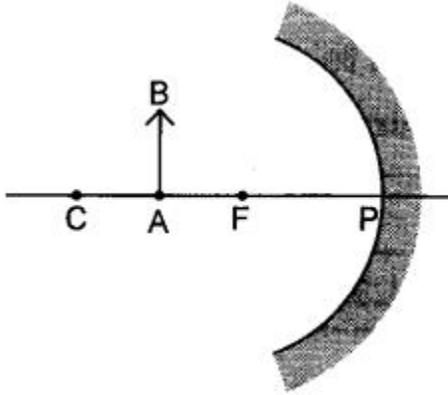
B. Split ring

C. Carbon brush

D. Armature

20. In an experiment, the formation for an object AB placed in front of a concave mirror is shown in figure, with an incomplete ray diagram

4



- A. Complete the ray diagram
- B. The image will be formed at _____.
- C. The nature and size of image formed is _____.
- D. Define Principle focus of concave mirror

21. (i) How sperm move towards the female germ cell? 2
 (ii) Draw a well labelled diagram of a human male reproductive system.

OR

Describe the components of blood along with their functions.

22. Explain the adaptation that occur in leaf for carrying out photosynthesis. 2

23. Why Graphite is a good conductor of electricity while Diamond does not conduct electricity? 2

24. a. If an iron nail immersed in the aqueous solution of copper sulphate, what are the changes happening to the nail and to the solution?

b. Write the balanced chemical equation for the equation between iron metal and aqueous solution of copper sulphate. 2

25. Calculate the net (equivalent) resistance of the circuit if resistances of $10\ \Omega$, $5\ \Omega$ and $15\ \Omega$ are connected in parallel. 2

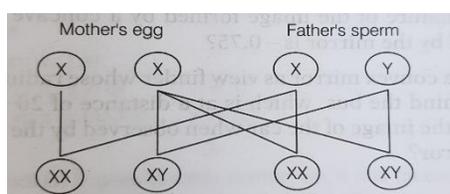
26. Explain why do the planets not twinkle but the stars twinkle. 2

27. A person crossed pure breed tall pea plants with pure breed dwarf pea plants, and obtained pea plants of F1 generation. He then performed two types of experiments. In the first he self-crossed the plants of F1-generation (experiment A), and in the second he crossed the plants of F1-generation with the pure-breed dwarf parent plants (experiment B), 3

- i- What would be the phenotypic and genotypic ratio of F2-generation in experiment 'A'?
- ii- How would the genotypic ratio differ in experiment 'B'?
- iii- How do we describe the phenotypic character that is expressed in F1- generation? What is the term given to the contrasting character?

OR

Consider the following cross which describes the process of sex determination in human beings.



Recompile the information given above and write about it in your own words.

28. 'Length of food chains in an ecosystem is generally limited to three or four trophic levels. Justify the statement. 3

29. i- Draw a diagram of excretory system in human beings and label on it: aorta, vena cava, urinary bladder, urethra.
ii- List two vital functions of the kidney. 3

30. A student dropped few pieces of marble in dilute hydrochloric acid, contained in test tube. The evolved gas was then passed through lime water. What change would be observed in lime water? What will happen if excess of gas is passed through lime water? Write balanced chemical equations. 3

31. An element X belongs to Period 3 and Group 1 of the Periodic table. 3

- a. State number of electrons in the outermost of the element.
- b. What is the valency of the element?
- c. Name the element.
- d. What is the formula of its sulphate?

- 32 a. What are Hydrocarbons? 3
- b. Give the structural differences between saturated and Unsaturated hydrocarbons with two examples each.
33. A 5cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15cm . Find the nature, position and size of the image. Also find its magnification. 3M
34. The atomic number of Calcium is 20. 5
- a. State Valence electron and valency.
- b. Identify its Period and Group.in the Periodic Table
- c. is it more or less reactive then Mg.and why?
- d. Will it be larger or smaller than K and why?
- e. What will be the formula of its hydride and Oxide ?
35. What are sexually transmitted diseases? 5
Name four such diseases.
Which one damages the immune system of human body?
- OR
- List four advantages of practicing vegetative propagation in plants.
Selecttwo plants raised by this method from the list given below :
Banana, gram, pea, Rose, tomato, wheat.
36. Explain the phenomenon of electromagnetic induction. Describe an experiment to show that a current is set up in a closed loop when an external magnetic field passing through the loop increases or decreases.
- OR
- Explain with the help of a labelled diagram the distribution of magnetic field due to a current through a circular loop. Why is it that if a current-carrying coil has n turns the field produced at any point is n times as large as that produced by a single turn? 5