

## Practice Paper 2020-21

### Class X Science

**Time:3Hour**

**Maximum Marks:80**

#### **General Instructions:**

- (i) *The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.*
- (ii) *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.*
- (iii) *Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should be in the range of 30 to 50 words.*
- (iv) *Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.*
- (v) *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.*
- (vi) *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.*
- (vii) *Wherever necessary, neat and properly labeled diagrams should be drawn.*

#### **SECTION A**

1. List any two observations when Ferrous Sulphate is heated in a dry test tube?

**OR**

Identify the products formed when 1 mL of dil. Hydrochloric acid is added to 1g of Sodium metal?

2. If focal length of a lens is -15cm, find its power.

3. Which of the following pairs will give displacement reactions'?

- a) NaCl solution and copper metal
- b)  $MgCl_2$  solution and aluminium metal
- c)  $FeSO_4$  solution and silver metal
- d)  $AgNO_3$  solution and copper metal.

4. Why do planets not twinkle?

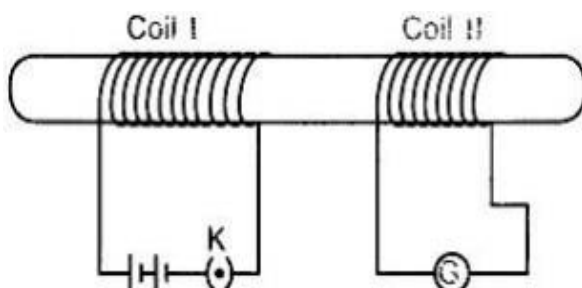
5. There are 2 types of lenses – convex lens and concave lens. Which of the 2 lenses has converging property and why?

6. For an object placed in front of a concave mirror, value of magnification is 1. What information does this value give about the size of the image?

**OR**

Name the part of a lens through which a ray of light passes without suffering any deviation.

7. With the help of the diagram, choose the correct answer of the following question-



The magnetic field passing through the coil II can be increased by increasing

- (i) number of turns in coil I
- (ii) current passing through coil I
- (iii) bringing coil II near coil I
- (iv) all of the above are correct

8. How magnetic field lines around a solenoid is similar to that of a bar magnet?

9. Draw a circuit diagram containing 2 resistances in parallel, connect a voltmeter across the resistances, a battery and a key.

**OR**

For what purpose ammeter and voltmeter are used?

10. What prevents backflow of blood inside the heart during contraction ?

11. State the role of liver and pancreas ?

12. What is ozone and how does it affect any ecosystem ?

13. State the role of Villi in digestion of food.

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:** After white washing the walls, a shiny white finish on walls is obtained after two to three days.

**Reason:** Calcium Oxide reacts with Carbon dioxide to form Calcium Hydrogen Carbonate which gives shiny white finish.

15. **Assertion:** Food chain is responsible for the entry of harmful chemicals in our bodies.

**Reason:** The length and complexity of food chains vary greatly.

**OR**

**Assertion:** Aquarium are known as the man made ecosystem.

**Reason:** Aquarium are created and maintained by human.

16. **Assertion:** A geneticist crossed a pea plant having violet flowers with a pea plant with white flowers, he got all violet flowers in first generation.

**Reason:** White colour gene is not passed on to next generation.

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

17. The main organ of human excretory system is kidney. It is reddish brown and bean shape structure, located towards the back of abdominal cavity, one on each side of backbone

(i) Flame cells are the excretory structures in

- a) Arthropods
- b) Annelids
- c) Platyhelminths
- d) Crustaceans

(ii) Main excretory organ of human is

- a) Kidney
- b) Lung
- c) Skin
- d) Liver

(iii) Structural and functional unit of kidney is

- a. Renal pelvis
- b. Nephridia
- c. Nephron
- d. hilum

- (iv) An adult human on an average produces
- 1-2 L of urine per day
  - 1-5 L of urine per day
  - 2-5 L of urine per day
  - 4-5 L of urine per day
- (v) An organism which does not have loop of henle will excrete
- No urine
  - Dilute urine
  - Concentrated urine
  - No change in urine

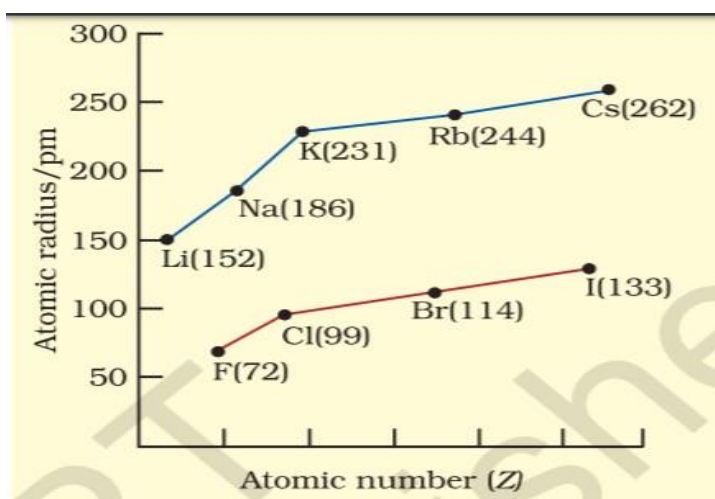
18. Read the following and answer any four questions from 18 (i) to 18 (v).

### **Metallic Character**

The ability of an atom to donate electrons and form positive ion (cation) is known as electropositivity or metallic character. Down the group, metallic character increases due to increase in atomic size and across the period, from left to right electropositivity decreases due to decrease in atomic size.

### **Non-Metallic Character**

The ability of an atom to accept electrons to form a negative ion (anion) is called non-metallic character or electronegativity. The elements having high electro-negativity have a higher tendency to gain electrons and form anion. Down the group, electronegativity decreases due to increase in atomic size and across the period, from left to right electronegativity increases due to decrease in atomic size.



18.(i) Which of the following correctly represents the decreasing order of metallic character of Alkali metals plotted in the graph?

- Cs>Rb>Li>Na>K
- K>Rb>Li>Na>Cs
- Cs>Rb>K>Na>Li

Cs>K>Rb>Na>Li

18(ii) Hydrogen is placed along with Alkali metals in the modern periodic table though it shows non-metallic character

- a) as Hydrogen has one electron & readily loses electron to form negative ion
- b) as Hydrogen can easily lose one electron like alkali metals to form positive ion
- c) as Hydrogen can gain one electron easily like Halogens to form negative ion
- d) as Hydrogen shows the properties of non-metals

18(iii) Which of the following has highest electronegativity?

- a) F
- b) Cl
- c) Br
- d) I

18(iv) Identify the reason for the gradual change in electronegativity in halogens down the group.

- a) Electronegativity increases down the group due to decrease in atomic size
- b) Electronegativity decreases down the group due to decrease in tendency to lose electrons
- c) Electronegativity decreases down the group due to increase in atomic radius/ tendency to gain electrons decreases
- d) Electronegativity increases down the group due to increase in forces of attractions between nucleus & valence electrons.

18(v) Which of the following reason correctly justifies that “Fluorine (72pm) has smaller atomic radius than Lithium (152pm)”?

- a) F and Li are in the same group. Atomic size increases down the group
- b) F and Li are in the same period. Atomic size increases across the period due to increase in number of shells
- c) F and Li are in the same group. Atomic size decreases down the group
- d) F and Li are in the same period and across the period atomic size/radius decreases from left to right.

19. Read the following and answer any **four** questions from 19 (i) to 19 (v)

A physics teacher while explaining the chapter Light: Reflection and Refraction to the students, demonstrated with the help of a glass filled with water. She took a paper and drew an arrow on it with the help of black marker. She brought the glass very near to the arrow. The students sitting in front of that glass saw that the arrow is magnified. Now as the glass is moved away from the arrow, at a point, the arrow is disappeared. Again, on moving the glass away from the arrow, student observed that the arrow is inverted.



19(i) Based on the diagram shown and information provided, the glass filled with water is behaving like

- a) Concave lens
- b) Convex lens
- c) Concave mirror
- d) Convex mirror

19(ii) The point where the arrow disappeared is

- a. focus
- b. centre of curvature
- C. optical centre
- d. infinity

19(iii) when the glass is held very close to the arrow, the image formed is

- a) Virtual
- b) Real
- C) Highly diminished
- d) At infinity

19(iv) If the arrow is placed at a distance of 5cm from the glass and focal length of glass is 3cm, find the position of image formed.

19(v) If the focal length of glass is 10cm and arrow is at a distance of 10cm from the glass, what will be the nature of the image and what will be the magnification produced by the glass.

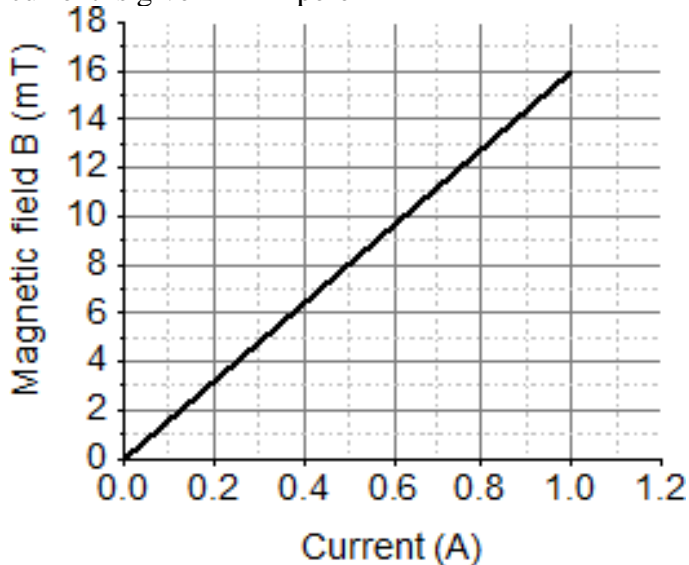
20. Read the following and answer any 4 questions from 20 (i) to 20 (v).

A solenoid is a long helical coil of wire through which a current is run in order to create a

magnetic field. The magnetic field of the solenoid is the superposition of the fields due to the current through each coil. It is nearly uniform inside the solenoid and close to zero outside and is similar to the field of a bar magnet having a north pole at one end and a south pole at the other depending upon the direction of current flow. The magnetic field produced in the solenoid is dependent on a few factors such as, the current in the coil, number of turns per unit length etc.

The following graph is obtained by a researcher while doing an experiment to see the variation of the magnetic field with respect to the current in the solenoid.

The unit of magnetic field as given in the graph attached is in milli-Tesla (mT) and the current is given in Ampere



20(i) What will happen if a soft iron bar is placed inside the solenoid?

- The bar will be electrocuted resulting in short-circuit.
- The bar will be magnetised as long as there is current in the circuit.
- The bar will be magnetised permanently.
- The bar will not be affected by any means.

20(ii) What type of energy conversion is observed in a linear solenoid?

- Mechanical to Magnetic
- Electrical to Magnetic
- Electrical to Mechanical
- Magnetic to Mechanical

20(iii) The magnetic field lines produced inside the solenoid are similar to that of

- a bar magnet
- a straight current carrying conductor
- a circular current carrying loop

d) electromagnet of any shape

20(iv) After analysing the graph a student writes the following statements.

- The magnetic field produced by the solenoid is inversely proportional to the current.
- The magnetic field produced by the solenoid is directly proportional to the current.

III. The magnetic field produced by the solenoid is directly proportional to square of the current.

IV. The magnetic field produced by the solenoid is independent of the current.

Choose from the following which of the following would be the correct statement(s).

- a) Only IV
- b) I and III and IV
- c) I and II
- d) Only II

20(v) From the graph deduce which of the following statements is correct.

- a) For a current of 0.8A the magnetic field is 13mT
- b) For larger currents, the magnetic field increases non-linearly.
- c) For a current of 0.8A the magnetic field is 1.3mT
- d) There is not enough information to find the magnetic field corresponding to 0.8A current.

### SECTION B

21. Differentiate between an artery and a vein.

22. Why is nutrition a necessity for an organism? state three reasons.

23. Give a test that can be used to confirm the presence of carbon in a compound. With a valency of 4, how is carbon able to attain noble gas configuration in its compounds?

### OR

The number of carbon compounds is more than those formed by all other elements put together. Justify the statement by giving two reasons.

24. The following observations were made by a student on treating four metals P, Q, R and S with the given salt solutions:

Sample	MgSO <sub>4</sub> (aq)	Zn(NO <sub>3</sub> ) <sub>2</sub> (aq)	CaSO <sub>4</sub> (aq)	Na <sub>2</sub> SO <sub>4</sub> (aq)
<b>P</b>	No reaction	Reaction occurs	Reaction occurs	No reaction
<b>Q</b>	Reaction occurs	Reaction occurs	Reaction occurs	Reaction occurs
<b>R</b>	No Reaction	Reaction Occurs	No Reaction	No Reaction
<b>S</b>	No Reaction	No Reaction	No Reaction	No Reaction

Based on the above observations:

- a) Arrange the given samples in the increasing order of reactivity
- b) Write the chemical formulae of products formed when Q reacts with CuSO<sub>4</sub> solution.

25. Give reason

- (i) Why dispersion takes place?



(ii) How many times phenomenon of refraction takes place when a white ray passes through a prism?

**26.** A piece of wire of resistance  $R$  is cut into 5 equal parts. These parts are then connected in parallel. If the equivalent resistance of this combination is  $R'$ , then find the ratio  $R/R'$ .

### Section C

**27.** In a pea plant, the trait of flowers bearing purple colour (PP) is dominant over white colour (pp). Explain the inheritance pattern of F<sub>1</sub> and F<sub>2</sub> generations with the help of a cross following the rules of inheritance of traits. State the visible characters of F<sub>1</sub> and F<sub>2</sub> progenies.

**28.**(i) Create a terrestrial food chain depicting four trophic levels.

(ii) Why do we not find food chains of more than four trophic levels in nature?

**29.** Explain the processes of aerobic respiration in mitochondria of a cell and anaerobic respiration in yeast and muscle with the help of word equations.

**30.**

(a) Which of the following reactions is/are an endothermic reaction(s) where decomposition also happens?

- a) Respiration
- b) Heating of lead nitrate
- c) Photosynthesis
- d) Electrolysis of acidified water

(b) Silver chloride when kept in the open turns grey. Illustrate this with a balanced chemical equation.

**31.** The following table shows the position of five elements A, B, C, D and E in the modern periodic table.

Answer the following giving reasons:

1. Which element is a metal with valency two?
2. Which element is least reactive?
3. Out of D and E which element has a smaller atomic radius?

**32.**(a) Explain the formation of Calcium Chloride with the help of electron dot structure. (Atomic numbers: Ca = 20; Cl = 17)

(b) Why do ionic compounds not conduct electricity in solid state but conduct electricity in molten and aqueous state?

**33.** Refractive index of water with respect to air is 1.33 and that of diamond is 2.42.

(i) In which medium does the light move faster, water or diamond?

(ii) What is the refractive index of diamond with respect to water?

### Section D

**34.** Match the following pH values 1, 7, 10, 13 to the solutions given below:

- Milk of magnesia
- Gastric juices
- Brine (aqueous NaCl)
- Aqueous Sodium hydroxide.

Amit and Rita decided to bake a cake and added baking soda to the cake batter. Explain with a balanced reaction, the role of the baking soda. Mention any other use of baking soda.

**OR**

(i) Four samples A, B, C and D change the colour of pH paper or solution to Green, Reddish-pink, Blue and Orange. Their pH was recorded as 7, 2, 10.5 & 6 respectively. Which of the samples has the highest amount of Hydrogen ion concentration? Arrange the four samples in the decreasing order of their pH.

(ii) Rahul found that the Plaster of Paris, which he stored in a container, has become very hard and lost its binding nature. What is the reason for this?

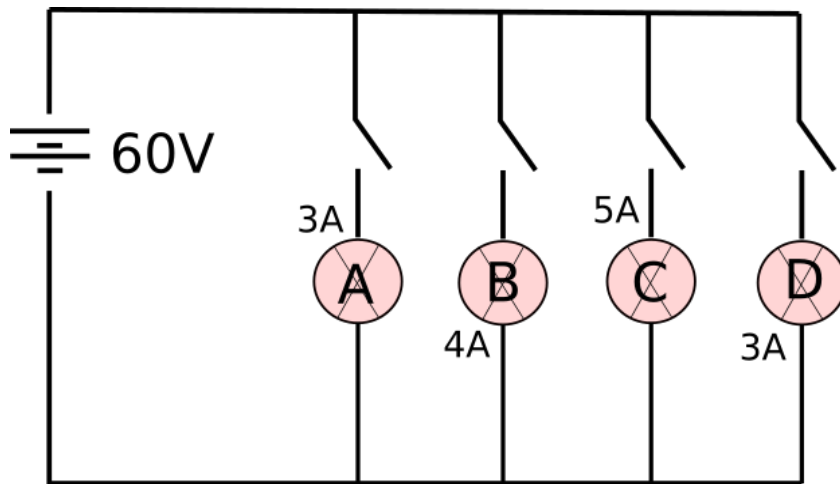
Also, write a chemical equation to represent the reaction taking place.

(iii) Give any one use of Plaster of Paris other than for plastering or smoothing of walls.

**35.** Describe the various steps involved in the process of binary fission with the help of a diagram.

b) Why do multicellular organisms use complex way of reproduction?

**36.** In the given circuit, A, B, C and D are four lamps connected with a battery of 60V

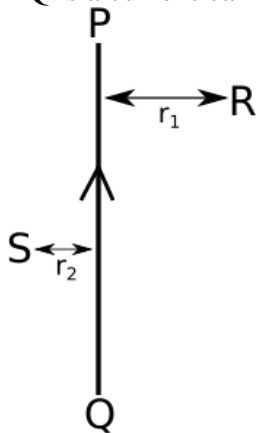


Analyse the circuit to answer the following questions.

- (i) What kind of combination are the lamps arranged in (series or parallel)?
- (ii) Explain with reference to your above answer, what are the advantages (any two) of this combination of lamps?
- (iii) Explain with proper calculations which lamp glows the brightest?
- (iv) Find out the total resistance of the circuit.

**OR**

PQ is a current carrying conductor in the plane of the paper as shown in the figure below.



- a) Find the directions of the magnetic fields produced by it at points R and S?
- b) Given  $r_1 > r_2$ , where will the strength of the magnetic field be larger? Give reasons.
- c) If the polarity of the battery connected to the wire is reversed, how would the direction of the magnetic field be changed?
- d) Explain the rule that is used to find the direction of the magnetic field for a straight current carrying conductor.

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