

PREBOARD -1
BHOPAL REGION
Class X
Science (086) Theory

Time: 3 Hours

MM 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. Answers 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

| No | Questions | Marks |
|----|--|-------|
| 1 | Which one of these has a higher concentration of H^+ ions ? 1M HCl or 1M CH_3COOH | 1 |

OR

| | | |
|---|--|---|
| | Write the chemical name and formula of compound used as an antacid in medicine. | |
| 2 | Give an example of metal which is a poor conductor of heat. | 1 |
| 3 | How does the concentration of H_3O^+ ions affected, when a solution of acid is diluted? | 1 |
| 4 | Arrange the following element in increasing order of their metallic character Li, K, Na | 1 |
| 5 | In peas, pure tall plant (TT) is crossed with a pure short plant (tt). Write the ratio of pure tall plant to pure short plant in F_2 generation. | 1 |
| 6 | What does the direction of thumb indicates in the Right Hand Thumb Rule. | 1 |
| 7 | What is the nature of metal oxides? | 1 |
| 8 | Which event in mouth cavity will be affected if salivary amylase is lacking in saliva. | 1 |
| 9 | The magnetic field in a given region is uniform. Draw a diagram to represent it. | 1 |

- | | | |
|----|--|---|
| 10 | Name the mode of asexual reproduction in which an organism divides into two or more individuals by mitotic division. | 1 |
| 11 | What is the nature of image formed by plane mirror. | 1 |
| 12 | Why does sky appears dark to astronauts? | 1 |
| 13 | Name two waste disposal methods. | 1 |

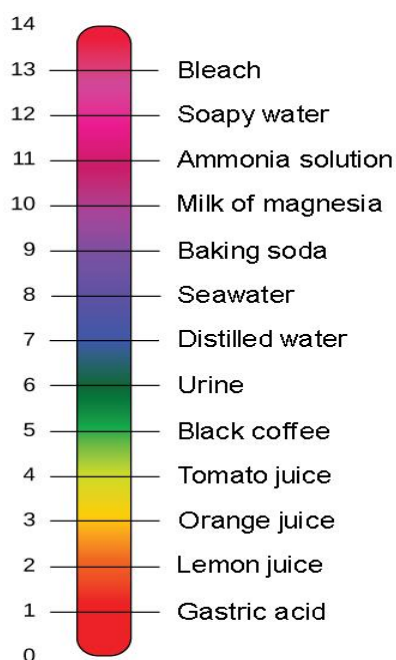
For question numbers 14, 15 and 16, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

- 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: Alkali metals have smallest size in a period. Reason: They are at the extreme left of the periodic table. | 1 |
| 15 | Assertion: Fertilization is a unique feature in flowers. Reason: It is followed by pollination. | 1 |
| 16 | Assertion: The connecting wires are made of copper. Reason: The electrical conductivity of copper is high. | 1 |

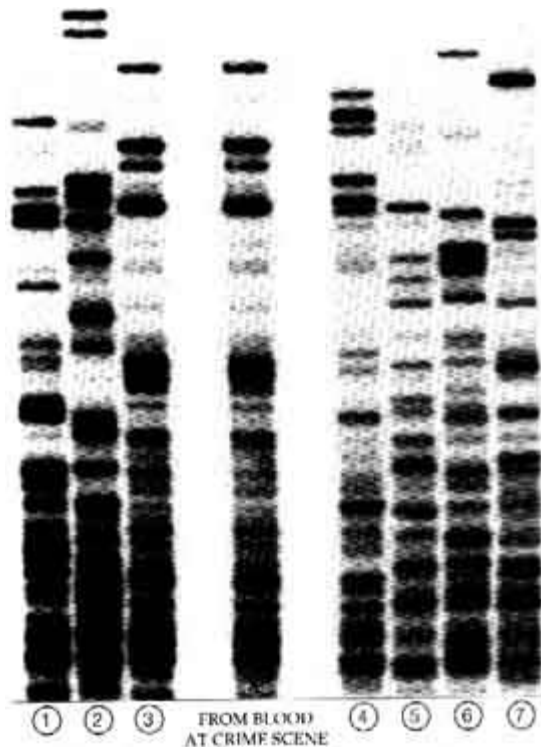
Q. 17 to 20 contain five sub-parts each. You are expected to answer any four sub-parts in these questions.

- 17 Study the following pH scale and answer the questions based on it.



- (i) With the increase in the concentration of hydrogen ions, the pH value will 1
- (a) Increase
 - (b) Decrease
 - (c) Remains constant
 - (d) Remains fluctuating
- (ii) What is the neutral value of pH scale? 1
- (a) Less than 5
 - (b) Equal to 7
 - (c) Less than 8
 - (d) Less than 10
- (iii) In terms of acidic strength, which one of the following is in correct decreasing order? 1
- (a) Black coffee > Tomato juice > Gastric acid
 - (b) Orange juice > Tomato juice > Lemon Juice
 - (c) Gastric Acid > Lemon Juice > Tomato Juice
 - (d) None of these
- (iv) A bakery shop started using baking soda instead of baking powder for baking cakes. What could be the reason for the decrease in sale of cakes? 1
- (a) Cakes of the shop are no more fluffy
 - (b) Cakes of the shop tastes bitter
 - (c) Change in colour of cakes
 - (d) Both (a) and (b)
- (v) What is baking powder made of 1
- (a) Baking Soda
 - (b) Tartaric Acid
 - (c) Both (a) and (b)
 - (d) Sodium Hydrogencarbonate

18 Smithville, yesterday: A man died from multiple stabwounds in Smithville yesterday. Police say that there were signs of a struggle and that some of the blood found at the scene of the crime did not match the victim's blood. They suspect that this blood came from the killer. To help find the killer, police scientists have prepared a DNA profile from the blood sample. When compared to DNA profiles of convicted criminals, kept on a computer database, no match was found. Photo of typical DNA profiles from two people. The bars are different fragments of each person's DNA. Each person has a different pattern of bars. Like fingerprints, these patterns can identify a person. Police are now asking all citizens of Smithville to come forward to have their DNA analysed. Sergeant Brown of the Smithville police said, "We just need to take a harmless scraping from the inside of the cheek. From this scientists can extract DNA and form a DNA profile like the one pictured." Except for identical twins, there is only a 1 in 100 million chance that two people will have the same DNA profile.



(i) This newspaper article refers to the substance DNA. What is DNA? 1

- (a) A chemical substance in cell membranes that stops the cell content leaking out
- (b) A chemical substance that contains the instructions to build our bodies
- (c) A protein found in the blood that helps carry oxygen to all the tissues.
- (d) A hormone in blood that helps regulate glucose levels in the body cells.

(ii) The newspaper article says that, except for identical twins, there is only a 1 in 100 million chance that two people will have the same DNA profile. Three students each gave an explanation of why there is such a variety of DNA. Gina said that a person's DNA is made up at conception. It is not inherited. Anna said that DNA can be altered by mutations to produce many different forms. Tom said that each person gets a new mix of DNA as half comes from each parent. Which one or more of the students gave a correct explanation? 1

- (a) Gina only.
- (b) Anna and Tom, but not Gina.
- (c) Gina and Anna, but not Tom
- (d) All three students.

(iii) DNA is to be extracted from a blood sample and from cheek scrapings. What is the reason why DNA will be found in both samples? 1

- (a) They are the only place where DNA can be found.
- (b) Both samples contain red blood cells.
- (c) Both samples contain cells with nuclei.

(d)Both samples contain body fluids.

- (iv) Which section of DNA provides information for one protein 1
(a) Nucleus
(b) Chromosomes
(c) Trait
(d) Gene
- (v)How many chromosomes are present in human beings? 1
(a)46 pairs
(b)44 pairs
(c)23 pairs
(d)22pairs

19 Refer Table A & B that shows the blood pressure chart and blood pressure report of a patient.

Table A : blood pressure chart

| Remarks | Systolic(mm of Hg) | diastolic(mm of Hg) |
|-------------------------|--------------------|---------------------|
| Doctors advice required | 200-400 | 100 or higher |
| Good | 100-140 | 80-89 |
| Excellent | 120 | 80 |

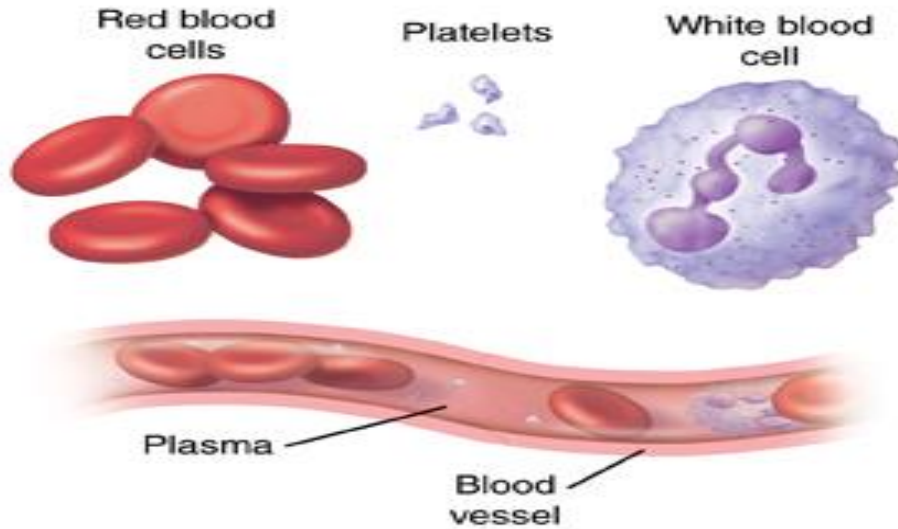
Table B: Blood pressure report of a patient

| Checking time | Systolic(mm of Hg) | diastolic(mm of Hg) |
|---------------------------|--------------------|---------------------|
| Blood pressure for a week | 130-150 | 100-120 |

- (i)Which disease of patient can be diagnosed from the given data 1
(a)Hypertension
(b)Hypotension
(c)Hyperthyroidism
(d)Hypothyroidism
- (ii)Refer Table A and find out the normal blood pressure value. 1
(a)140-89mm of Hg
(b)140-100mm of Hg
(c)120-80mm of Hg
(d)160-120mm of Hg
- (iii)Which instrument is used to measure blood pressure? 1
(a)Sphygmomanometer
(b)Manometer
(c)Stethoscope
(d)Barometer

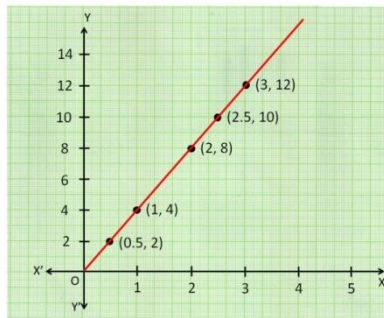
Answer question numbers 18(iv)-(v) on the basis of your understanding of the following paragraph and the related studied concepts.

Blood is a fluid connective tissue that circulates our body and delivers essential substances like oxygen to the body cells. It also transports metabolic waste products away from the cells. Figure alongside depicts the percentage composition of different components of blood. Blood cannot be made or manufactured outside the body. Blood donation is the only source of blood for patients that need blood transfusion.



- (iv) In which component of blood , all the blood cells are suspended? 1
(a)RBC
(b)WBC
(c)Platelets
(d)Plasma
- (v) Name the component of blood that carries oxygen from the lungs to all the body tissues. 1
(a)RBC
(b)WBC
(c)Platelets
(d)Plasma

| | | | | | |
|-----------------|-----|---|---|-----|----|
| I (Amperes) (A) | 0.5 | 1 | 2 | 2.5 | 3 |
| V (Volts) (V) | 2 | 4 | 8 | 10 | 12 |



(i) Find the resistance from the given graph

- (a) 0.25 ohm
- (b) 0.25 ohm meter
- (c) 4 ohm meter
- (d) 4 ohm

(ii) Condition for validity of ohm's law.

- (a) Temperature should remain constant
- (b) Current should be proportional to voltage
- (c) Resistance would be wire wound type
- (d) All of the above

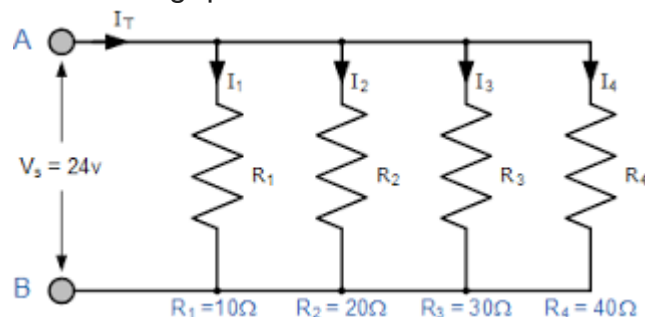
(iii) According to ohm's law

- (a) V is directly proportional to I
- (b) V is inversely proportional to I
- (c) V is directly proportional to I^2
- (d) None of these

A number of resistors are said to be connected in series if there is only one path for current to flow between two points and current through each resistor is same.

A number of resistors are said to be connected in parallel if there is more than one path for current to flow between two points and potential across each resistor is same.

Study the figure of combination of resistors given below and answer the following questions.



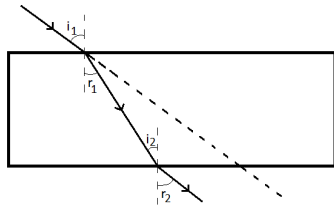
(iv) Identify the type of combination of resistors from the following figure

- (a) Series combination
 - (b) Parallel combination
 - (c) Series-Parallel combination
 - (d) Parallel-Series combination
- (v) Find the equivalent resistance from the given figure 1
- (a) $25/120$ ohm
 - (b) $5/24$ ohm
 - (c) $24/5$ ohm
 - (d) 100 ohm

SECTION B

- 21 The atomic numbers of P, Q, R and S are 6, 10, 12, and 17 respectively 2
 Draw the covalent bond formed by any two of these elements.
- 22 State one advantage and disadvantage of using a convex mirror for seeing traffic at the rear. 2

OR

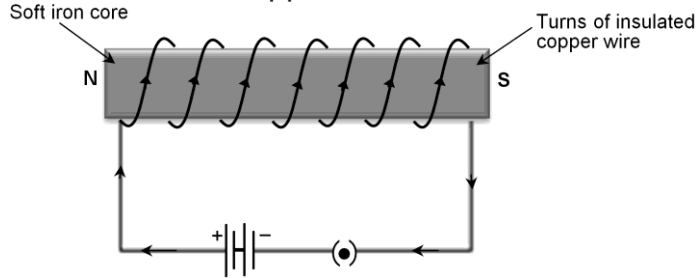


A student observes the above phenomenon when light passes through a glass slab. What is the phenomenon called. Why does light ray bend when it enters from one medium to other.

- 23 Aquariums need to be cleaned once in a while, whereas ponds or lakes do not require any cleaning. Explain. 2
- 24 Non biodegradable chemicals like pesticides accumulate in the body of living organisms (like plants, animals including human beings) in a food chain. There is an increase in the concentration of harmful chemicals at each trophic level of a food chain. Accumulation of harmful chemicals in our body can be avoided. Explain how this can be done. (Any two) 2

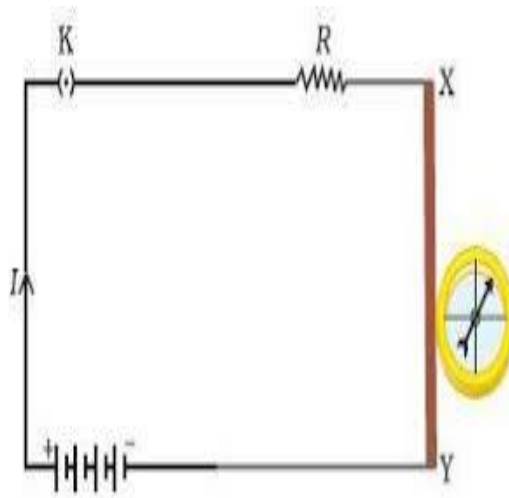
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An electromagnet consist of a core of soft iron wrapped around with a coil of insulated copper wire. 2



State two ways by which the strength of an electromagnet can be increased.

OR



- (i) A compass needle gets deflected when brought near a current carrying conductor. Why?
- (ii) What happens to the deflection of needle when current in the conductor is increased.

26

State the rule to determine the direction of a force experienced by a current carrying straight wire placed in a magnetic field which is perpendicular to it. 2

SECTION C

27

A chemical reaction is generally characterized by many changes like Evolution of gas, change in colour, change in state of substances Change in temperature and formation of precipitate. 3

- (i) What is observed when a solution of potassium iodide is added to a solution of lead nitrate taken in a test tube?
- (ii) What type of reaction is this?
- (iii) Write a balanced chemical equation to represent the above reaction.

28

'Reproduction is not necessary to maintain the life of an individual, unlike other life processes such as nutrition, respiration or excretion. 3

Still an individual wastes energy for reproduction.' Derive your own conclusion from the above given statement and describe it accordingly.

- 29 Explain with the help of a diagram how pollen after landing on the stigma of a flower helps male germ cell to reach the female germ cells. Label the following: Ovary, Female germ cell, Male germ cell and pollen grain. 3

OR

Describe, in brief, the changes the uterus undergoes

- (i) to receive the zygote.
(ii) if zygote is not formed.

- 30 3

| Resistivities at 20°C | |
|------------------------------|--|
| Material | Resistivity ($\Omega \cdot m$) |
| Aluminum | 2.82×10^{-8} |
| Copper | 1.72×10^{-8} |
| Gold | 2.44×10^{-8} |
| Nichrome | $150. \times 10^{-8}$ |
| Silver | 1.59×10^{-8} |
| Tungsten | 5.60×10^{-8} |

On the basis of the given table, answer the following questions.

- (i) Among silver and copper which one is better conductor? Why?
(ii) Which material would you advise to use in electrical heating devices? Why?
(iii) Which material is used in making filaments of electric bulb? Why?
- 31 You are given two lenses A and B of focal length 10cm and -10cm respectively. State the nature and power of each lens. Which of the two lenses will form a virtual and magnified image of an object placed 8cm from it. 3
- 32 (i) Why calcium starts floating when added to water? 3
(ii) Most of the metals do not give hydrogen while reacting with nitric acid. Why?
(iii) Write equation for the reaction of iron with steam.
- 33 The electrons in the atoms of four elements A, B, C and D are distributed in three shells having 1, 3, 5 and 7 electrons in the outermost shell respectively. 3
(i) State the period in which these elements can be placed.
(ii) Write the valency of B and D.
(iii) Write the molecular formula of the compound formed when A and

D combines.

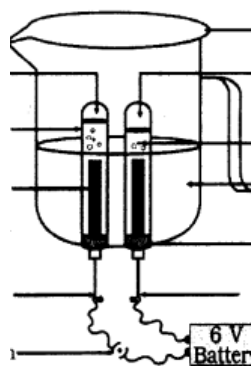
SECTION D

- 34 The following diagram displays a chemical reaction. Observe carefully and answer the following questions: 5



- Identify the type of chemical reaction that will take place and define it.
- What changes in colour takes place to the salt. Write the chemical equation of the reaction that takes place.
- Mention one commercial use of the salt.

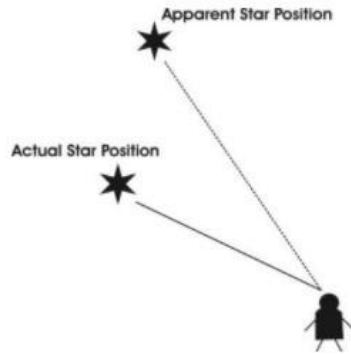
OR



- Observe the following diagram and answer the following questions
- Identify the type of reaction in the above diagram.
 - Identify the gases evolved at anode and cathode.
 - Why are the amount of two gases collected in two test tubes not of same volume.
 - Why should we use salt water in the above reaction?
 - Write the equation of reaction involved.

35

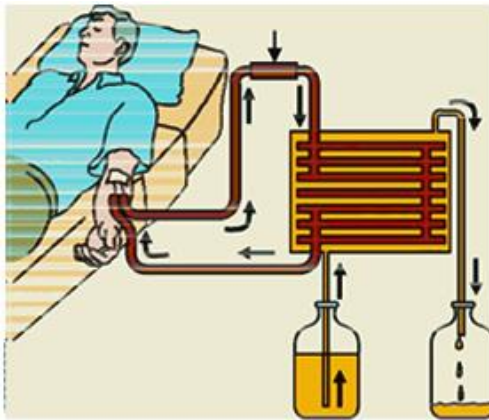
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- (i) In the given figure we can see there is a change in actual and apparent position of star. Explain the reason for this.
- (ii) Explain why stars twinkle and planets do not.
- (iii) When white light passes through a prism it splits into seven colours. Where do you observe this phenomenon in nature.

36

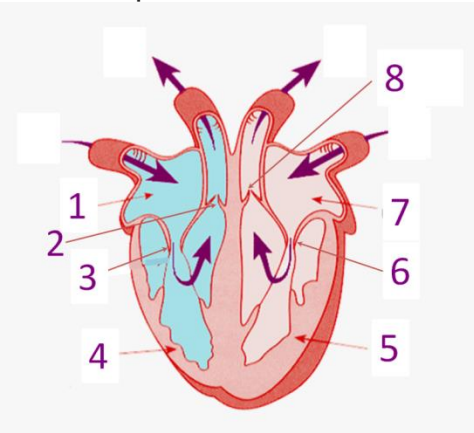
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- (i) Identify the process taking place in the diagram. When does this process become essential for an individual?
- (ii) Describe the above process in detail.

OR

Different parts of human heart is numbered in the figure.



- (i) Identify any two parts from the above figure which carry oxygenated and deoxygenated blood.
- (ii) Explain the process of double circulation with the help of a flowchart.

