PRE-BOARD / X / SCIENCE / 2020-21

Time: 3 Hrs. **M. M.: 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 16 carrying 1 mark each multiple choice (MCQs), very short answer questions and question 17 to 20 are assertion- reason type questions carrying 4 marks each. Answers to these questions should be given in one word or one sentence each.

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

(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 each.

(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 each.

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

(vii) Wherever necessary, neat and labeled diagrams should be drawn.

SECTION A

Q1. The examples of amphoteric oxides are : 1

a)Na_2O and MgO b) Al_2O_3 and ZnO

c)ZnO and Fe_2O_3 d)Al_2O_3 and MgO

Or

An element B forms an oxide BO_2 which is acidic in nature. B is :

a) Metal b)Non-metal c)Alkali metal d)none of the above

Q2. Walls of trachea do not collapse when there is less air in it. Why? 1

Q3. How many covalent bonds are there in the molecule of ethane? 1

Q4. A baker found that the cake prepared by him is hard and small in size 1
Which ingredient has he forgotten to add that would have make the cake fluffy?

Q5. How does an atomic size vary from left to right in a period? 1

Q6. An element has atomic number 13. The group and period number to which this element belongs are : 1

a)10 and 3 b)13 and 3 c)15 and 4 d)3 and 5

Or

The element with smallest atomic radius is

a) Chlorine b)Fluorine c)Bromine d)Iodine

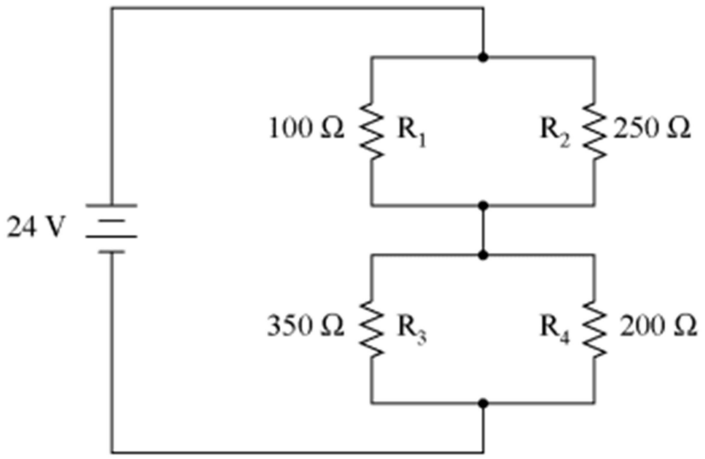
Q7. All the member in a group of the periodic table have the same 1

a) Atomic number b) Number of valence electrons

c)Mass number d) Number of electrons

Q8. For the following combination of resistors, find the magnitude of total electric current flowing through the circuit. 1

A series-parallel combination circuit



Q9. What controls characteristics or traits in living organisms? 1

Q10. Draw a diagram showing the path of a ray of light when it passes through a glass prism. 1

Q11. How is the process of fission in Amoeba different from Plasmodium? 1

Q12. Write one ill effect of Ozone depletion . 1

OR

How can we dispose Industrial waste? Write one method.

Q13. Plastics are non-biodegradable substances. Why? 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 options A, B, C, D as given below:

(a) Both A and R are true, and R is the 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.

Q14. Assertion: Element carbon forms compounds mainly by covalent bonding 1

Reason: Carbon has four valence electrons it cannot gain or lose four electrons because high energy is required so it can only share four electrons

Q15. **Assertion**: A rainbow is a natural spectrum appearing in the sky after a rain shower. 1

Reason: It **is** caused by dispersion of sunlight by tiny water droplets, present in the atmosphere.

OR

Assertion: Planet do not twinkle

Reason: The planets are much closer to the surface of the earth, and are thus seen as extended sources of light.

Q16. Assertion:(A) Asexual reproduction is superior to sexual reproduction. 1

Reason:(R) Asexual reproduction is a source of variation in a population of organism.

Q17. Read the following and answer any four questions from 17(i) to 17(v).

The separation of right side and the left side of the heart is useful to keep oxygenated and deoxygenated blood from mixing. Such a separation allows a highly efficient supply of oxygen to the body.

i) What prevents deoxygenated blood from mixing with oxygenated blood? 1

a) Presence of Nodes.
b) Presence of valves
c) Presence of different chambers
d) Presence of Cardiac muscles

ii) Choose the correct option: 1

A	Pulmonary Artery	Carries Blood from the lungs to the heart.
B	Pulmonary Vein	Carries blood to the lungs from heart.
C	Valves in Heart	Prevent backward flow of Blood.
D	Vena Cava	Biggest Artery.

a) A, B and C are correct

b) Only C is correct
c) A and D are correct

d) Only D is correct

iii) Which one of the following chambers of the human heart contains oxygenated blood? 1

a) Left auricle and left ventricle.

b) Left auricle and right ventricle
c) Right auricle and left ventricle.

d) Right auricle and right ventricle.

iv) Choose the correct option 1

a) Right ventricle-Deoxygenated Blood

b) Pulmonary vein - Deoxygenated Blood

c) Left auricle- Deoxygenated Blood

d) Aorta- Deoxygenated Blood

v) Fishes have: 1

a) One chambered heart.

b) Two chambered heart.

c) Three chambered heart.

d) Four chambered heart

Q18. Read the following and answer any four questions 18 (1) to 18 (5) 1x4=4

Acids, bases and indicators

Acids are sour in taste and change the colour of blue litmus to red whereas bases are bitter and change the colour of red litmus to blue . Indicators are used to test the nature of substances as acidic , basic or neutral.

Acids and bases can be classified as strong or weak on the basis of ionization i.e. amount of H+ and OH—ions in solutions.

pH scale is used to measure hydrogen ion concentration which ranges from 0(very acidic) to 14(very alkaline)

i) Few drops of red litmus solution were added to each one of the following Substances .Which one turns red litmus solution blue ? 1

a) Alcohol b) Sodium hydroxide solution

c) Distilled water d) Hydrochloric acid

ii) Which of the following is an example of natural indicator: 1

a) Methyl orange b) Litmus

c) Phenolphthalein d) None of the above

iii) An example of strong acid is 1

a) Acetic acid b) Hydrochloric acid

c) Carbonic acid d) All of the above

iv) Few drops of phenolphthalein are added to hydrochloric solution. After some time the colour observed is: 1

A) Blue B) Pink

C) Colourless D) Green

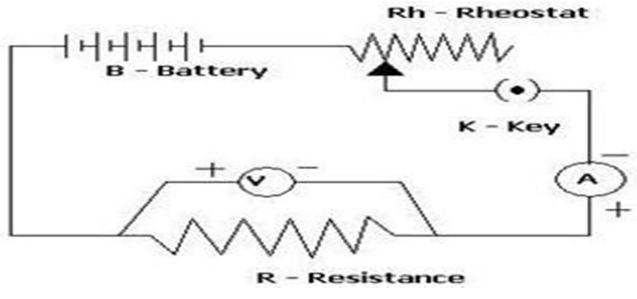
v) The pH of a given liquid is14.Which of these it could be: 1

A) Distilled water B) Lemon juice

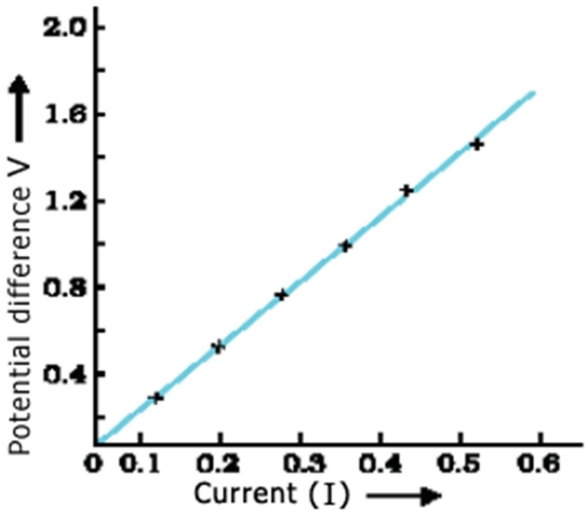
C) 1M NaOH solution D)Tomato juice

Q19. Read the following and answer any four questions from 19 (i) to 19 (v) 1x4=4

Sukanya performed an experiment to verify Ohm's law and observations were recorded in an observation table. She plotted a V-I graph with the recorded observations



iii)



i) When electric current flows through a conductor for long time, the temperature of it- 1

(a) first increases, then decreases
(b) increases continuously
(c) Remains constant
(d) decreases continuously

ii) When no other resistor or appliance except a metal wire of length L is connected to a battery of 12 V, the potential difference across the wire is 12 V. If length of the wire connected in the circuit is made $\frac{L}{2}$, then the potential difference across the wire will become- 1

(a) 24 Volt
(b) 12 Volt
(c) 6 Volt
(d) 18 Volt

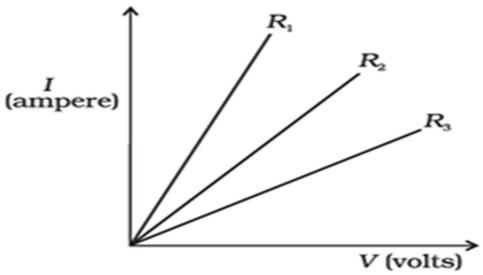
iii) The slope of I-V graph is - 1

(a) resistance of the conductor
(b) resistivity of the conductor
(c) conductivity of the conductor
(d) reciprocal of the resistance of the conductor

iv) Three resistors of resistances 5 Ω ,10Ω ,15 Ω are connected in series to a battery of potential difference V. If a current of 0.2A flows through the resistor of 5Ω, then the potential difference (EMF) between the terminals of the battery is- 1

(a) 12 V , (b) 10 V , (c) 6 V , (d) 8V

v) 1



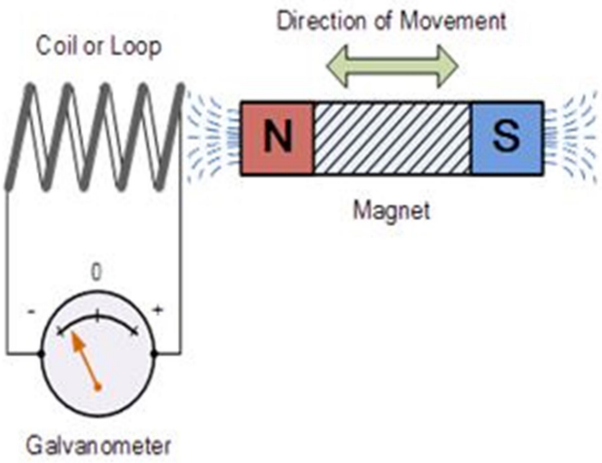
If three resistors of resistances R_1, R_2 *and* R_3 are connected one by one to a battery for verification of Ohm's Law. Above graph shows the variation in electric current flowing through the resistors with the change in potential difference between the

ends of the resistors. Which one is not correct about the resistance of the resistors?
(a) $R_1 < R_2 < R_3$
(b) $R_3 < R_2 < R_1$
(c) $R_1 < R_2 > R_3$
(d) $R_2 > R_3 . R_1$

Q20. Read the following and answer any 4 questions from 20 (i) to 20 (v) 1x4=4

Suppose while shopping you go cashless and your parents use cards. The shopkeeper always scans or swipes the card. Shopkeeper does not take a photo of the card or tap it. Why does he swipe/scan it? And how does this swiping deduct money from the card? This happens because of the '**Electromagnetic Induction**'.

Can moving objects produce electric currents? How to determine a relationship between electricity and magnetism? Can you imagine the scenario if there were no computers, no telephones, no electric lights. The experiments of Faraday has led to the generation of generators and transformers.



The induction of an electromotive force by the motion of a conductor across a magnetic field or by a change in magnetic flux in a magnetic field is called **'Electromagnetic Induction'.**

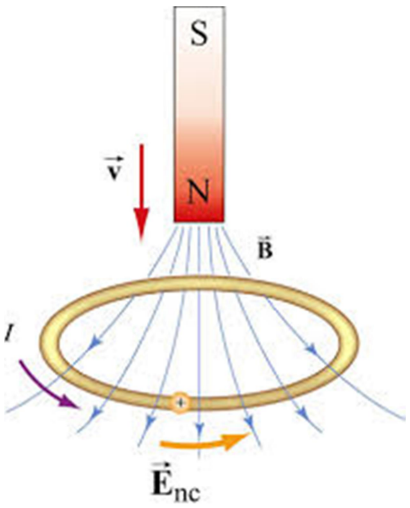
This either happens when a conductor is set in a moving magnetic field (when utilizing AC power source) or when a conductor is always moving in a stationary magnetic field

i) According to Faraday's experiment of electromagnetic induction, electric current can be induced in a coil by- 1
(a) connecting the ends of the coil with terminals of a battery
(b) by keeping the coil at rest in a magnetic field
(c) By moving the coil in a magnetic field rapidly
(d) None of the above.

ii) When a bar magnet is passed through a coil, potential difference is produced between the ends of the coil. Strength of induced potential difference between the ends of the coil does not depend on- 1

(a) Strength of the bar magnet
(b) No of turns in the coil
(c) resistivity of the metal used to make the coil
(d) speed of the bar magnet.

iii) A circular loop of copper wire is placed horizontally as given in the figure and a bar magnet is allowed to fall from inside of the loop in such a way that length of the magnet is along the axis of the loop. Acceleration produced in the bar magnet will be – 1



(a) equal to the gravitational acceleration
(b) less than gravitational acceleration
(c) greater than gravitational acceleration
(d) will be depending on the diameter of the coil and length of the bar magnet

iv) Strength of emf (potential difference) induced in a coil does not depend on- 1

(a) Number turns in unit length of the coil
(b) Rate of the change of magnetic flux bound by the coil
(c) resistance of the coil
(d) on both (a) and (b)

v) Electric current produced in the process of electromagnetic induction is- 1

(a) A.C only
(b) D.C only
(c) A.C and D.C both
(d) none of the above

SECTION-B

Q21. Consider the following chemical reaction: 2

$X + BaCl_2$ -----→ $Y + 2NaCl$

a) Identify X and Y
b) Name the type of reaction

OR

Identify the type of reaction for the following reactions:
a) $CaO\ (s) + H_2O(l)$ -----→ $Ca(OH)_2\ (aq) + Heat$
b) $CaCO_3(s) + heat$ --------→ $CaO(s) + CO_2(g)$

Q22. An element M has atomic number 11: 2

a) Write its electronic configuration

b) State the group to which M belongs

c) Is M a metal or non-metal

d) Write the formula for its chloride

Q23. Why do testes lie outside the abdominal cavity in human males? 2

OR

Why does menstruation occur?

Q24. Study the following cross and fill in the blanks with appropriate answers: 2

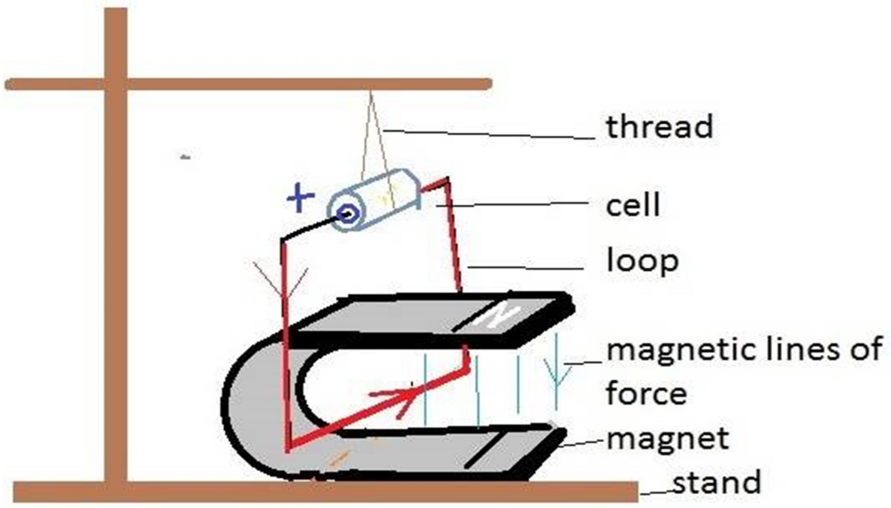
Parent	TT	X	tt
	Pure Homozygous Tall		Pure Homozygous dwarf
F1	Tt	X	i) **?**
Genotyp phenotypic R ratio	ii) **?**		
Phenoty genotypic ratio	iii) **?**		

Q25. Two identical objects are in a straight line and distance between them is 24 cm. Where should a converging lens of focal length of 9cm be placed between the two objects, so that images of both the objects are formed at the same point on the principal axis? 2

Q26. In the figure given below a conductor is placed perpendicular to the direction of the magnetic field. When this conductor is connected to a cell or a battery, there is motion in the conductor. 2

(a) State the rule used to find the direction of the motion of the conductor.

(b) Write the two factors on which displacement produced in the current carrying conductor placed in a magnetic field depend .



SECTION-C

Q27. (a)What is redox reaction? 3

(b) Identify the substance oxidized, reduced, oxidizing agent, reducing agent in the following reaction:

$2PbO + C \dashrightarrow Pb + CO$

OR

10 gm of silver chloride is taken in a china dish and kept in sunlight for some time. Now the answer the following:

a) Identify the type of chemical reaction. How will the colour of the salt change.

b) Write the chemical equation of the reaction that takes place.

c) Mention one commercial use of this salt.

Q28. Identify the homologous series to which the following carbon compounds belong to and name these compounds: 3

C_3H_4, C_3H_6, C_2H_6

Q29. i) Write two points of difference between Asexual and Sexual reproduction. 3

ii) How do fragmentation and budding differ from each other?

Q30. Different species use different strategies to determine sex of a new born individual 3

i) How is it genetically determined in human beings?

ii) How is it environmentally determined in reptiles?

Q31. i) The existence of decomposers is essential in a Biosphere? Why? 3

ii) Why is the flow of energy in a food chain unidirectional?

Q32. 3

A student observed the sky at night and experienced that stars were sometimes brighter, and some other time fainter.

(i) What do we call this phenomena experienced by the student ?

(ii) Name any two factors responsible for the above phenomena experienced by the student .

(iii) Draw a diagram to exhibit the phenomena experienced by the student.

Q33. A conductor of length 50 cm and diameter 0.07cm is connected to a source of 220 V. If resistivity of the conductor is 4.4 X 10^{-6} $\Omega \times m$, then find- 3

(i) Resistance of the conductor

(ii) Heat generated by the conductor in 5 seconds

SECTION-D

Q34. a) What is meant by reactivity series of metals? 5

Arrange the metals gold, iron, magnesium, and copper in the increasing order of their reactivity.

b) Write balanced chemical reactions for the following reactions.

(i) Iron nail dipped in copper sulphate solution.

(ii)Magnesium wire burns in air.

(iii) Iron reacts with steam.

OR

a) Write the electron dot structure of magnesium.

b) Why do ionic compounds have high melting points.

c) Name one metal and non-metal that exist as liquid at room temperature.

d) Explain why calcium metal after reacting with water starts floating on its surface. Write the suitable chemical reaction involved.

Q35 i) Take two test tubes A and B each containing 1 ml of 1% starch solution. Add 1 ml of saliva in the test tube A and keep this setup for at least 20-30 min. Then add iodine solution in both the test tubes A and B. What do you observe and why? Also name the enzyme present in saliva. 5

ii) Why does absorption of digested food occur mainly in the small intestine?

Q36. In the figure given below a dentist is examining the teeth by using a spherical mirror. 5

(i) Name the mirror used to examine the teeth.

(ii) Draw a ray diagram showing the image formation by the mirror in above case.

(iii) What is the nature and size of the image of a tooth cavity formed by dentist mirror?

(iv) If distance between the mirror and a tooth cavity is equal to or more than 5 cm , then dentist is not able to see the image. What may be the reason behind it ?

OR

Define refractive index of a medium with respect to other. Also define absolute refractive index of a medium. If refractive indices of water and glass with respect to air are 1.33 and 1.5 respectively, then find-

(i) speed of light in water and glass

(ii) refractive index of glass with respect to water