VAGDEVI VILAS SCHOOL- MARATHAHALLI
PRE BOARD EXAMINATION- II (2019-20)
SCIENCE

CLASS: X **MAX MARKS: 80**
DATE: 03/02/2020 **TIME: 3 hrs**

General Instructions:

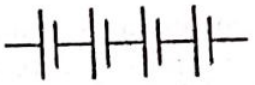
i. **The question paper comprises of three sections-A, B and C. Attempt all the sections.**
ii. **All questions are compulsory.**
iii. **Internal choice is given in each sections.**
iv. **All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion reason type questions. They are to be answered in one word or in one sentence.**
v. **All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50-60 words each.**
vi. **All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80-90 words each.**
vii. **This question paper consists of a total of 36 questions.**

SECTION A

Q1.In Fleming's left hand rule
(a) forefinger points towards direction of motion.
(b) thumb gives direction of motion.
(c) central finger points towards the direction of motion.
(d) little finger points towards the direction of motion.

Q2.The proper representation of series combination of cells (Figure) obtaining maximum potential is

(a) 1 (b) 2
(c) 3 (d) 4

1. 
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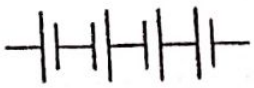
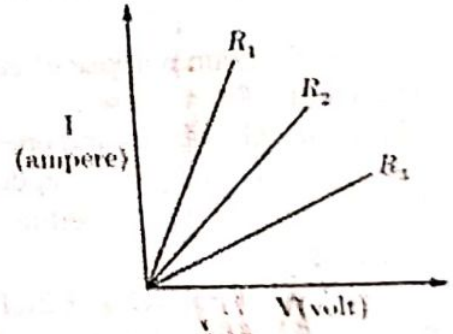
3. 
4. 

OR

A student carries out an experiment and plots the V-I graph of three samples of nichrome wire with resistances R_1, R_2 and R_3 respectively (Figure). Which of the following is true?

(a) $R_1 = R_2 = R_3$ (b) $R_1 > R_2 > R_3$
(c) $R_3 > R_2 > R_1$ (d) $R_2 > R_3 > R_1$



Q3.In order to determine the focal length of a concave mirror by obtaining the image of distant object on screen, the position of screen should be:
(a) parallel to plane of concave mirror
(b) perpendicular to plane of concave mirror
(c) inclined at an angle 60° to plane of mirror
(d) in any direction with respect to the plane of concave mirror

Q4.Soaps are formed by the saponification of:
(a) Alcohol
(b) Glycerides
(c) Simple esters
(d) Carboxylic acid

Q5. The highly metallic element will have the configuration of:

(a) 2,8,7
(b) 2,8,2
(c) 2,8,8,5
(d) 2,8,8,1

Q6. During electrolytic reduction of molten alumina, aluminium metal is deposited at:

(a) Aluminium anode
(b) Carbon cathode
(c) Aluminium cathode
(d) Carbon anode.

Q7. A well-stained leaf peel mount, when observed under the high power of a microscope, shows nuclei in:

(a) guard cells only
(b) epidermal cells only
(c) guard cells and epidermal cells
(d) guard cells, epidermal cells and stomata

OR

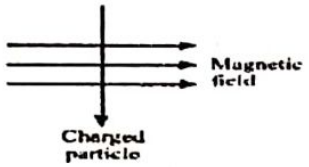
During germination of seed, water enter in seeds through

(a) hilum
(b) micropyle
(c) raphe
(d) cotyledon.

Q8. While preparing a temporary stained mount of a leaf epidermal peel, the extra stain is removed by:

(a) washing with water
(b) washing with calcium chloride solution
(c) soaking with blotting paper
(d) absorbing with cotton wool

Q9. A charged particle enters at right angles into a uniform magnetic field as shown. What should be the nature of charge on the particle if it begins to move in a direction pointing vertically out of the page due to its interaction with the magnetic field?



Q10. Give two reasons why different electrical appliances are connected in parallel.

OR

What is the main purpose of earthing an electrical appliance? And what is the usual colour of insulation of earth wire.

Q11. Write one advantages and one hazards of nuclear energy.

Q12. The pH of the sample of vegetable soup was found to be 6.5. How is this soup likely to taste?

Q13. Identify the compound getting oxidised, reduced, oxidising agent and reducing agent in the following reaction:

$$Pb(NO_3)_2 + 2KI \text{ ---------- } PbI_2 + 2KNO_3$$

Q14. Write the chemical equations when sulphur-di-oxide is passed through:

a) Water
b) Lime water.

OR

Which will have more H^+ ions concentration: 1M HCl solution or 1M CH_3COOH solution. Why?

Q15. Why should management of natural resources ensure their equitable distribution?

Q16. No two individuals are absolutely alike in a population. Why?

Q17. Write one advantage of food web in an ecosystem.

(Q.no 18 to 20) In each of the following questions, a statement of Assertion is given by the corresponding statement of Reason. Of the statements, mark the correct answer as.

(a) If assertion is true and reason is correct explanation of assertion.
(b) If assertion is true but reason is false.
(c) If assertion is false but reason is true.
(d) If both are false.

Q18. **Assertion**: Thin layer of nickel is deposited on surface of iron.
Reason: coating of certain metals over iron prevents rusting of iron.

Q19. **Assertion:** The incident and emergent rays are parallel to each other in the case of a rectangular glass slab.
Reason: The lateral displacement of emergent ray is independent of the thickness of the slab.

Q20. **Assertion**: Green plants are autotrophs.
Reason: Green plants synthesise their own food using sunlight, chlorophyll, carbon dioxide and water.

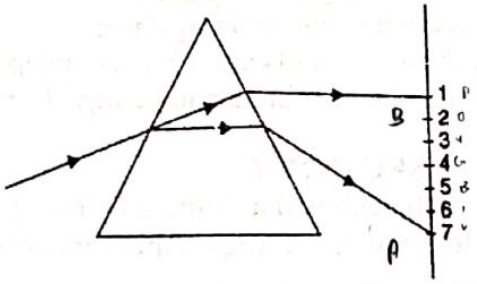
SECTION B

Q21. (a) How does a solenoid behave like a magnet? Can you determine the north and south poles of a current-carrying solenoid with the help of a bar magnet? Explain.
(b) Draw the pattern of magnetic field lines around a solenoid.

Q22. Give reasons for the following
(a)The sky appears to be blue during day time to a person on earth.
(b)The sky near the horizon appears to have a reddish hue at the time of sunrise and sunset.
(c)The stars appear to twinkle.

OR

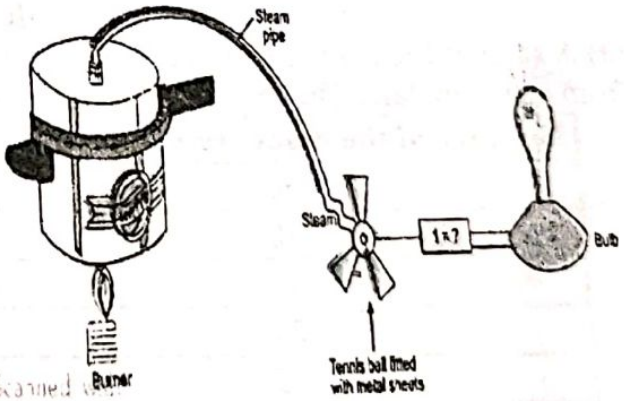
A beam of white light falling on a glass prism gets splits up into seven colours marked 1 to 7 as shown in the diagram. A student makes the following statements about the spectrum observed on the screen.
(a) The colours at position marked 3 and 5 are similar to the colour of the sky and the core of hard-boiled egg respectively. Is the statement made by the student correct or incorrect? Justify.
(b) Which two positions correspond closely to the colour of (i) a solution of potassium permanganate? (ii) Danger or stop signal lights?



(c)Light of two colours A and B pass through a glass prism. '**A**' deviates more than **B** from its path of incidence. Which colour has a higher speed in the prism?

Q23. (a) What is bio gas? Name the major component of biogas.
(b) Following model demonstrates the process of thermo -electric production.

(i) Identify and label the device marked as 1.
(ii) Why is tennis ball fitted with metal sheets rotated?
(iii) Name the device, which depends on the principle demonstrated by this model.
(iv) Which form of energy is converted into electrical energy.



Q24. a) The melting points of three members A, B, C of a homologous series of hydrocarbons are 183°C, -138°C and -130°C respectively. Which would have lowest number of carbon atoms in its molecule? Why?

b) Which two of the following belong to the same homologous series:
CH_4O, $C_2H_6O_2$, C_2H_6O, C_2H_6.

c) Write a chemical test to distinguish between cooking oil and butter.

Q25. An element is placed in 2nd group and 3rd period of the modern periodic table, burns in presence of oxygen to form a basic oxide.

a) Identify the element and write its electronic configuration.

b) Write the formula of the compound formed when the element reacts with nitrate ion.

c) Predict the nature of the salt formed above with supporting equation.

Q26. A metal M which is one of the best conductors of heat and electricity used in making electric wires is found in nature as sulphide ore M_2S:

a) Name the metal M.

b) Define the method that would be employed for converting it to its oxide.

c) Write the steps involved in the process of extraction from its concentrated ore with the help of necessary equations.

OR

a) Show the formation of sodium oxide by transfer of electrons.

b) What is the nature of the above compound formed?

c) List two properties of such compounds.

Q27 How do organisms, whether reproduced asexually or sexually maintain a constant chromosome number through several generations? Explain with the help of suitable example.

OR

Explain with an example, how each one of the following provides evidences in favour of evolution in organisms:

(a) Homologous organs

(b) Analogous organs

(c) Fossils

Q28. (a)Explain how nastic movements takes place in plants.

(b)Mention three problems faced while constructing dams.

Q29. How do Mendel's experiment show that traits are inherited independently?

Q30. What is meant by the feedback mechanism in human beings? Explain by giving one example.

SECTION-C

Q31. A student finds the writing on the blackboard as blurred and unclear when sitting on the last desk of the class room. He however sees clearly when sitting on the front desk of an approximate distance 2 m from the blackboard.

i. Draw the ray diagram to illustrate the formation of image of the blackboard writing by his eye lens when he sits at the: (a) last desk (b) front desk

ii. Name the defect of vision the student is suffering from. Also, list two causes of this defect.

iii. Name the kind of lens that would enable him to see clearly when he is seated at the last desk. Draw the ray diagram to illustrate how this lens helps him to see clearly.

OR

(a) A student focussed the image of a candle flame on a white screen by placing the flame at distances from a convex lens. He noted his observation in the following table:

Distance of the flame from lens (cm)	Distance of the screen from lens (cm)
60	20
40	24
30	30
24	40
12	70

Analyse the above table and answer the following questions:

i. What is the focal length of convex lens?

ii. Which set of observation is incorrect and why?

iii. Draw the ray diagram to show the image formation for any correct set of observation.

(b) A real image, $\frac{1}{5}$th the size of object is formed at a distance of 18 cm from a mirror.

i. What is the nature of mirror? Calculate its focal length.

ii. Draw the ray diagram to show the image formation.

Q32. i. Two identical resistors each of resistance 10W are connected in: (a) Series (b) Parallel in turn to a battery of 6 V. Calculate the ratio of power consumed by the combination of resistor in the two cases.

ii. List two factors on which the resistance of a conductor depends.

iii. What is the difference between kilowatt and kilowatt hour.

Q33. a) A compound 'X' having molecular formula $C_2H_4O_2$ reacts with sodium metal to form compound 'Y' and evolves a gas which burns with a pop sound. 'X' reacts with an alcohol 'Z' in presence of conc.H_2SO_4 to form a sweet smelling compound 'S' with molecular formula $C_3H_6O_2$. On addition of sodium hydroxide to 'X', it gives back 'Y' and water. 'S' on treatment with sodium hydroxide solution gives back 'Y' and 'Z'. Identify X, Y, Z, and S and write the equations involved.

b) Give two advantages of detergent over soap.

Q34. a) Identify compound X on the basis of reactions given below. Also write name and chemical formula of A, B and C.

$X + Zn$ ---------- $A + H_2$

$X + HCl$ ---------- $B + H_2O$

$X + CH_3COOH$ --------- $C + H_2O$

b) Explain the cleansing action of soap.

OR

An element 'X' is placed in the 14th group and 2nd period of the modern periodic table. Answer the following questions stating for your reason in each case:

a) Write the electronic configuration of the element X and predict its nature.

b) Write the formula of the compound formed when X reacts with hydrogen.

c) Draw the electron dot structure of above compound and identify the nature of bonding involved in it.

d) Write the formula of the oxide of element X and predict its nature.

e) Write a chemical equation for the reaction when the oxide of X is dissolved in water and predict its pH.

Q35. Why fertilisation is only possible, if copulation takes place during the middle of menstrual cycle? Also, name the process which gets temporarily stopped, when a woman gets pregnant.

(i) Prenatal sex-determination has been banned in India. Comment.

(ii) Explain with the help of suitable examples why certain traits cannot be passed on to the next generation. What are such traits called?

Q36. Draw a neat diagram of cross-section of human heart. Name and label the following on the diagram:

(i) structure/part that divides heart into right and left halves and prevents mixing of oxygenated and deoxygenated blood;

(ii) the main artery that carries blood away from the heart;

(iii) chamber that receives deoxygenated blood from various parts of the body;

(iv) chamber from where oxygenated blood is pumped out to various parts of the body.

(b) Write the function of valves present in between atria and ventricles.

(c) Write one structural difference between the composition of artery and veins.

OR

(a) Draw a neat diagram of an excretory unit of a human kidney and label the following parts.

(i) Bowman's capsule

(ii) Renal artery

(iii) Glomerulus

(iv) Collecting duct

(b) Give one advantage of having a large number of these highly coiled structures in our kidneys.

(c) Mention any two substances which are selectively reabsorbed as the filtrate flows along the tubular part of this unit.