VELAMMAL BODHI CAMPUS

Grade: X-BATCH-II **GRAND TEST– I (2023-24)** **Sub: Science**
Date: **Marks: 80**

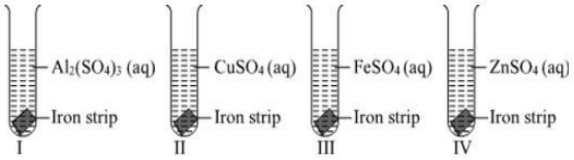
General instructions:

i. This question paper consists of 39 questions in 5 sections.
ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
iii. Section A consists of 20 objective type questions carrying 1mark each.
iv. Section B consists of 6 very short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.
v. Section C consists of 7 short answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words
vi. Section D consists of 3 long answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION- A

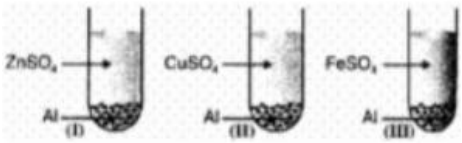
Select and write one most appropriate option out of the four options given for each of the questions 1 – 20 **(20 x 1=20)**

1. A student adds one big iron nail each in four test tubes containing solution of zinc sulphate, aluminium sulphate, Copper sulphate and iron sulphate. A reddish brown coating was observed only on the surface of iron nail which Was added in the solution of:



(a) Aluminium sulphate b) copper sulphate c) Iron sulphate d) Zinc sulphate

2.



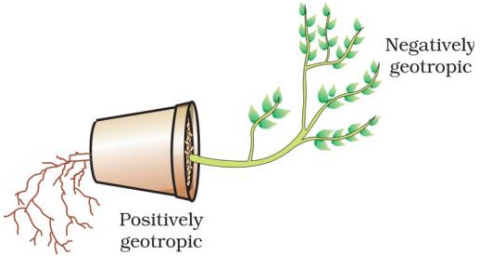
Observation	I	II	III
Solution after reaction	Colourless	Colourless	Colourless
Metal Deposited	Zn	Cu	Fe

Which of the following is correct conclusion?
a) Al is more reactive than Cu and Fe but lesser active than Zn
b) Al is more reactive than Cu but less reactive than Zn and Fe
c) Al is more reactive than Zn and Cu but lesser active than Fe
d) Al is more reactive than Zn, Cu, Fe.

3. Which of the following is the correct representation of the electron dot structure of nitrogen?

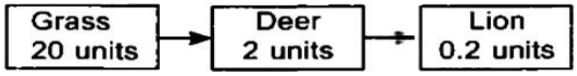
(a) $:\dot{N}::\dot{N}:$ (b) $:\ddot{N}:\dot{N}:$ (c) $:N\vdots N:$ (d) $:\ddot{N}:\ddot{N}:$

4. Which of the following compound is under go addition reaction?
   a)C_3H_8 b)C_2H_2 c)CH_4 d)$C_{12}H_{22}O_{11}$
5. Generally metals react with acids to give salt and hydrogen gas. Which of the following acids does not give hydrogen gas on reacting with metals (except Mn and Mg)?
   a)HNO_3 b) H_2SO_4 c) HCl d) All of these
6. We will observe white precipitate in which of the following reaction?
   A) Barium chloride is mixed with hydrochloric Acid
   B) Barium chloride is mixed with sodium Chloride solution
   C) Barium chloride is mixed with sodium Sulphate solution
   D) Barium carbonate is mixed with sodium Sulphate solution
7. A hydrocarbon which can add two molecules of Br_2 Is
   a) $H_2C = CH - CH = CH_2$
   b) $H_3C - CH = CH - CH_3$
   c) $HC \equiv CH$
   d) Both $H_2C = CH - CH = CH_2$ and $HC \equiv CH$
8. A black strip of paper was clipped onto a destarched leaf in a potted plant to cover a part of the leaf. The plant was then exposed to sunlight for four hours, the paper strip was removed and the leaf was tested for starch.When iodine solution was added:
   (a)The entire leaf turned blue-black.
   (b)The uncovered part of the leaf became blue-Black.
   (c)The colour of the iodine solution remained unchanged.
   (d) The covered part of the leaf became blue-Black.
9. What stage of the menstrual cycle is a woman said to be fertile?
   a) Ovulation phase b) All of these c) Secretary phase d) Proliferative phase
10. Spinal cord originated from
    (a) Cerebrum (b) Medulla (c) Pons (d) Cerebellum
11. Which amongst the listed tools was used to study the law of inheritance in peaplant by Gregor J Mendel?
    (a) Family tree (b) Pedigree chart(c) Punnett square (d) Herbarium sheet
12. Based on the given diagram answer the following question given below.



    Where does negative phototropism occur in plants?
    a) Root (b) shoot (c) Leaves (d) All of the these
13. If the area of cross section of a resistance wire is halved, then it's resistance becomes
    a) 4 times b) one half c)2 times. d) one fourth

14. A soft iron bar is introduced inside a current-carrying solenoid. The magnetic field inside a solenoid:
    a) Decrease b) Will increase c) Will become zero d) Will remain unaffected
15. The ozone layer is mainly damaged by:
    a) Carbon dioxide b) Chlorofluorocarbons c) Methane d) Sulphur dioxide
16. What does the given flow chart represent?



    a) Biomagnification b) Lindeman's law
    c) Unidirectional energy flow and Lindeman's law d) None of these
17. **Assertion:** All chemical reactions are accompanied by changes in energy.
    Reason: Energy is always required to drive a chemical reaction.
    (a) Both A and R are true and R is the correct explanation of A.
    (b) Both A and R are true but R is not the correct explanation of A.
    (c) A is true but R is false. (d) A is false but R is true.
18. **Assertion:**Dominant allele is an allele whose phenotype expresses even in the presence of another allele of that gene.
    Reason: It is represented by a capital letter. , e. g. T.
    (a) Both A and R are true and R is the correct explanation of A.
    (b) Both A and R are true but R is not the correct explanation of A.
    (c) A is true but R is false. (d) A is false but R is true.
19. **Assertion:** The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the radius of the circular coil.
    Reason: Magnetic field strength is inversely proportional to the radius of the circular coil.
    (a) Both A and R are true and R is the correct explanation of A.
    (b) Both A and R are true but R is not the correct explanation of A.
    (c) A is true but R is false. (d) A is false but R is true.
20. **Assertion:** Kulhads are made of loamy soil.
    Reason: Making these kulhads on a large scale would result in the loss of the fertile top soil
    (a) Both A and R are true and R is the correct explanation of A.
    (b) Both A and R are true but R is not the correct explanation of A.
    (c) A is true but R is false. (d) A is false but R is true.

SECTION –B

Q. No. 21 to 26 are very short answer questions.

(6x2=12)

21. Consider the following molecular formulae of carbon compounds:
    (i)CH_3COOH (ii) CH_3OH (iii) C_2H_6 (iv) C_3H_4 (v) C_4H_8
    a) Which one of these compounds belongs to homologous series of alcohols?
    b) Identify the compound having triple bond between carbon – carbon atoms.

c) Write the molecular formula of the first member of the homologous series to which CH_3COOH belongs.

d) Write the general formula of the series to which the compound C_4H_8 belongs.

22 (a) State one drawback of each of the following:

(i) Oral contraceptive pills (ii) Copper-T

23. What is lymph? Mention its function.

(OR)

a) Trace the movement of oxygenated blood in the body.

b) Write the function of valves present in veins.

24. How can you distinguish between plane mirror , convex mirror and concave mirror by merely looking at the image formed in each case.

(OR)

On the way from Kanpur to Delhi there were four friends. Sunil was driving the car and saw from his side mirror that the car which was behind their car had met an accident. He suddenly applied the brake even after his friends asked him to leave the situation as it is. But Sunil did not agree and get down of car and persuaded his friends to help the injured. All of them took the injured person to the nearest hospital. After taking first aid from hospital the victim thanked and pleased them for saving his life. Read the above passage and answer the following questions:

i. Name the type of mirror from which Sunil saw the accident.

ii. Why this mirror is used as a side mirror in vehicles?

iii. What can you learn from the Sunil's character?

25. Why does the sky appear dark instead of blue to astronaut?

26. What are the problems caused by the non-biodegradable wastes that we generate?

SECTION –C

Q.no. 27 to 33 are short answer questions

(7x3=21)

27. How do you classify elements into metals and non-metals on the basis of their electronic configuration?

Choose metal and non-metal out of the following:

$$^{23}_{11}A, ^{19}_{9}B, ^{24}_{12}C, ^{31}_{15}D, ^{35}_{17}E$$

ii. What type of bond will be formed if

a) 'A' combines with 'B'? b) 'A' combines with 'E'?

c) 'C' combines with 'E'? d) 'D' combines with 'E'?

28. i. Give differences between roasting and calcination with suitable examples.

Explain how the following metals are obtained from their compounds by the reduction process. Give one exampleof each type.

a) Metal M which is in the middle of the reactivity series.

b) Metal N which is high up in the reactivity series.

OR

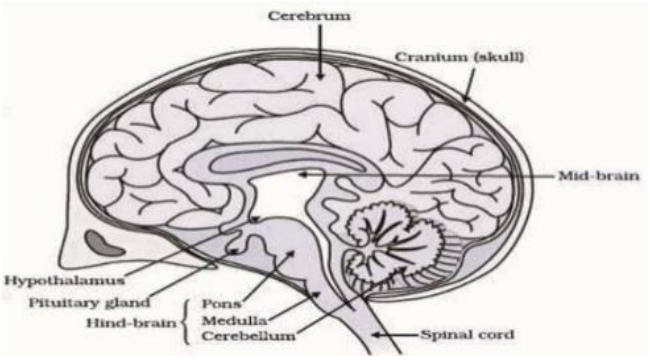
ii)An ore, on heating in air, give sulphur dioxide gas. Name the method in each metallurgical step, that will be required to extract this metal from its ore.

ii. State which of the following reactions will take place or which will not, giving suitable reason for each?

a) $Zn_{(s)} + CuSO_{4\ (aq)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$

b) $Fe_{(s)} + ZnSO_{4(aq)} \rightarrow FeSO_{4(aq)} + Zn_{(s)}$

29. Explain Mendel's observation when he crossed a homozygous tall (TT) plant with homozygous dwarf (tt) plant followed by self-cross.
30. Given below is a labelled diagram of the human brainUsing the given diagram, answer the following questions:



a) Which part of the brain controls reflex movements of the head, neck, and trunk?

b) Name the part of the human brain which contains a vital centre for controlling blood pressure.

c) Which part of the hindbrain regulates respiration?

31. Sudha finds out that the sharp image of window pane of her science laboratory is formed at a distance of 15 cm from the lens. She now tries to focus the building visible of her outside the window instead of the window pane without disturbing the lens. In which direction will she move the screen to obtain a sharp image of the building?

    What is the approximate focal length of this lens?
32. Draw a schematic diagram of a circuit consisting of a battery of 3 cells of 2 V each, a combination of three resistors of 10 Ω, 20 Ω and 30 Ω connected in parallel, a plug key and an ammeter, all connected in series. Use this circuit to find the value of the following :

    (a) Current through each resistor

    (b) Total current in the circuit

    (c) Total effective resistance of the circuit.
33. (a) Define power and state its SI unit.

    (b) A torch bulb is rated 5 V and 500 mA. Calculate its

    (i) power

    (ii) resistance

    (ii) energy consumed when it is lighted for 2 ½ hours.

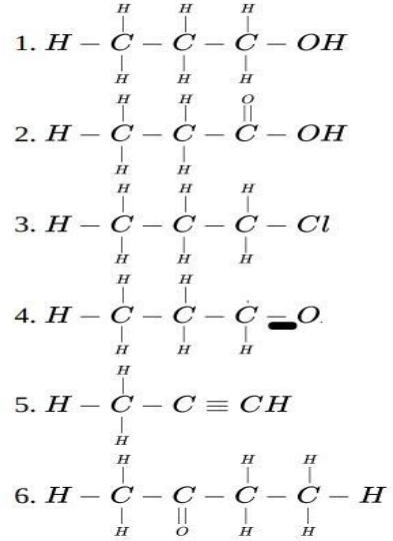
SECTION –D

Q.no. 34 to 36 are long answer questions **(3x5=15)**

34. (a) You have three unlabelled test tubes containing ethanol, ethanoic acid and soap solution. Explain the method youWould use to identify the compounds in different test tubes by chemical tests using litmus paper and sodium Metal.

(b)

Name the following compounds.



(OR)

Discuss the formation of covalent bonds in molecules of:

i) Methane

ii) Carbon tetrachloride

iii) Water

35. (a)Explain the post fertilization changes that occur in the ovary of a flower.

(b)In a germinating seed, which parts are known as future root and future shoot? Mention the function of cotyledon.

(OR)

(a)A squirrel is in a scary situation. Its body has to prepare for either fighting or running away. State the immediate changes that take place in its body so that the squirrel is able to either fight or run?

(b)Pertaining to endocrine system, what will interpret if:

(i)You observe swollen neck in people living in the hills.

(ii)Over secretion of Growth Hormone takes place.

36. A thin converging lens form a real magnified image and virtual magnified image of an object in front of it.

i. Write the positions of the objects in each case.

ii. Draw ray diagrams to show the image formation in each case.

iii. How will the following be affected on cutting this lens into two halves along the principal axis?

a. Focal length b. Intensity of the image formed by half lens.

(OR)

Rishi went to a palmist to show his palm. The palmist used a special lens for this purpose.

i. State the nature of the lens and the reason for its use.

ii. Where should the palmist place/hold the lens so as to have a real and magnified image of an object?

iii. If the focal length of this lens is 10 cm and the lens is held at a distance of 5 cm from the palm, use lens formula to find the position and size of the image.

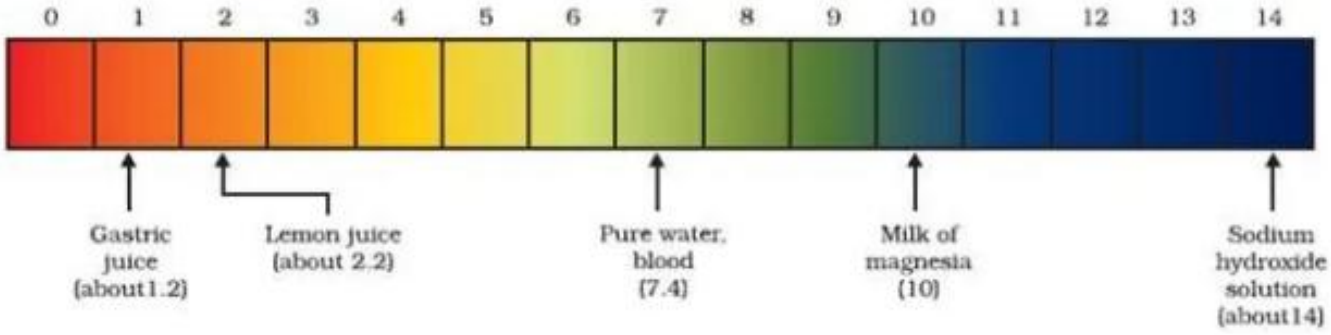
SECTION - E

Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts

(3x4=12)

37. Read the text carefully and answer the questions:

The strength of acid and base depends on the number of H^+ and the number of OH^- respectively. If we takeHydrochloric acid and acetic acid of the same concentration, say one molar, then these produce different amounts of hydrogen ions. Acids that give rise to more H^+Ions are said to be strong acids, and acids that give less H^+Ions are said to be weak acids.



i) Can you now say what weak and strong bases are?

ii) Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd?

iii) Is Gastric juice a weak acid?

iv) Milk of magnesia is an acid or base? For what purpose it can be used

38. Sameer first crossed pure - breed pea plants having round yellow seeds with pure-breed pea plant having wrinkled-green seeds and found that only A-B type of seeds were produced in the F1 generation. When F1 generation pea plants having A-B type of seeds were crossed breed by self-pollination, then in addition to the original round yellow and wrinkled-green seeds, two new varieties A-D and C-B types of seeds were also obtained.

(a) What are A-B type of seeds?

(b) Out of A-B and A-D types of seeds, which one will be produced in

i) minimum number and

ii) maximum number in the F2 generation

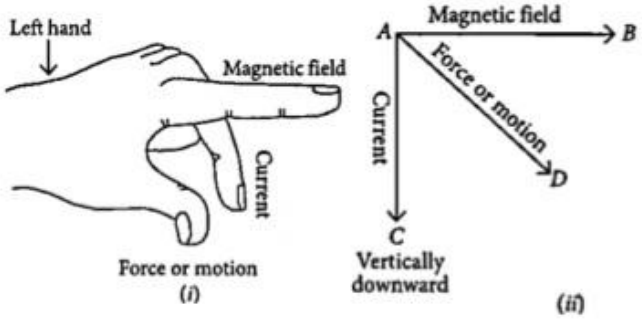
(c)What are A-D type of seeds?

(OR)

What are C-B type of seeds?

39. Read the text carefully and answer the questions:

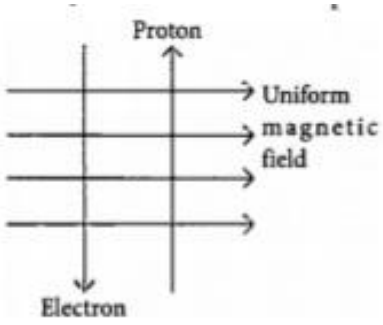
Andre Marie Ampere suggested that a magnet must exert an equal and opposite force on a current-carrying conductor, which was experimentally found to be true. But we know that current is due to charges in motion. Thus, it is clear that a charge moving in a magnetic field experience a force, except when it is moving in a direction parallel to it. If the direction of motion is perpendicular to the direction of magnetic field, the magnitude of force experienced depends on the charge, velocity (v), strength of magnetic field (B), and sine of the angle between v and B. Direction of magnetic force is given by Fleming's left-hand rule.



(i) If an electron is travelling horizontally towards east. A magnetic field in vertically downward direction exerts a force on the electron along which direction?

(ii) A charged particle is moving with velocity v in a magnetic field of induction B. The force on the particle will be maximum when

(iii) A uniform magnetic field exists in the plane of paper pointing from left to right as shown in figure. In the field, an electron and a proton move as shown. Where do the electron and the proton experience the force?



(OR)

An electron beam enters a magnetic field at right angles to it as shown in the figure. What would be the direction of force acting on the electron beam?