QUESTION PAPER-2
SCIENCE

SECTION-A

Select and write one most appropriate option out of the four options given for each of the questions 1-20

1. The pairs which will show displacement reaction is /are :- **[1]**

(i) NaCl solution and copper metal

(ii) $AgNO_3$ solution and copper metal

(iii) $Al_2(SO_4)_3$ Solution and magnesium metal

(iv) $ZnSO_4$ solution and iron metal

(a) (ii) Only (b) (i) and (ii) (c) (ii) and (iii) (d) (ii), (iii) and (iv)

2. When sodium bicarbonate reacts with dilute hydrochloric acid, the gas evolved is **[1]**

(a) Hydrogen: it gives pop sound with burning match stick

(b) Hydrogen: it turns lime water milky

(c) Carbon dioxide: It blows off a burning match stick with a pop sound.

(d) Carbon dioxide: it turns lime water milky.

3. Select the appropriate state symbols of the products given as X and Y in the following chemical equation by choosing the correct option from the table given below: **[1]**

$Zn_{(s)} + H_2SO_{4(l)} \rightarrow ZnSO_{4(x)} + H_{2(y)}$

	X	Y
(a)	(s)	(g)
(b)	(aq)	(g)
(c)	(aq)	(l)
(d)	(g)	(g)

4. In the equation :- $PbO_2 + 4HCl \rightarrow PbCl_2 + 2H_2O + Cl_2$ **[1]**

The substance undergoing oxidation is _____.

(a) Lead dioxide (b) Hychloric acid (c) Lead Chloride (d) Hydrogen

5. To prevent tooth decay we are advised to brush our teeth regularly. **[1]**

The nature of the tooth paste commonly used is :-

(a) Acidic (b) Basic (c) Neutral (d) Corrosive

6. In graphite, carbon atoms are arranged in _____ pattern. **[1]**

(a) Trigonal (b) Tetrahedral (c) Hexagonal (d) Pentagonal

7. Which oxide is neutral? **[1]**

(a) NO_2 (b) MgO (c) CuO (d) H_2O

8. The separation of the right side and left side of human heart is useful to- **[1]**

(a) Keep oxygenated blood separate from mixing with deoxygenated blood.

(b) Allow a slow supply of oxygen in the body.

(c) Supply energy to animals with low energy needs

(d) Often change their body temperature.

9. Select the correct statement – **[1]**

(a) Heterotrophs do not synthesise their own food.

(b) Heterotrophs utilize solar energy for photosynthesis.

(c) Heterotrophs synthesise their own food.

(d) Heterotrophs are capable of converting carbon dioxide and water into carbohydrates.

10. The number of chromosomes in parents and off springs of a particular species constant due to –

(a) Doubling of chromosomes after zygote formation **[1]**

(b) Halving of chromosomes during gamete formation

(c) Doubling of chromosomes after gamete formation

(d) Halving of chromosomes after gamete formation

11. Which of the following is not an involuntary action? **[1]**

(a) Vomiting (b) Salivation (c) Heart beat (d) Chewing

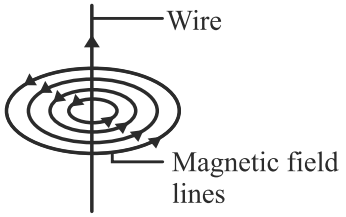
12. Excessive exposure of humans to UV rays results in- **[1]**

(i) Damage to immune system (ii) Damage to lungs

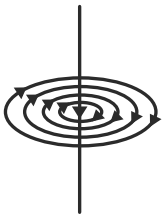
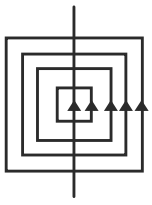
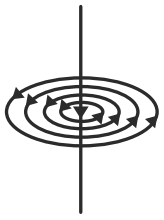
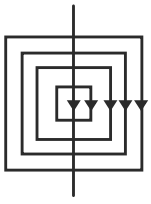
(iii) Skin cancer (iv) Peptic ulcer

(a) (i) and (ii) (b) (ii) and (iv) (c) (i) and (iii) (d) (iii) and (iv)

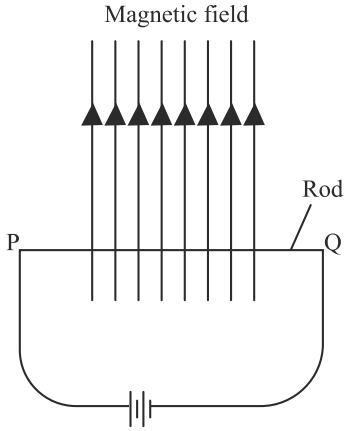
13. The image shows the magnetic field lines around a straight current carrying conductor. **[1]**



If the direction of the current in the straight wire is changed, what change in the magnetic field line will be observed ?

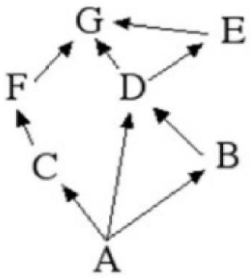
(a)  (b)  (c)  (d) 

14. A metal rod PQ is placed in the magnetic field. The ends of the rod are connected with a battery using wires. Where will the rod move ? **[1]**



(a) Into the field (b) Upward (c) Downwards (d) Out of the field

15. In the food web, which two organisms are competing for food? **[1]**



(a) A and B (b) A and C (c) D and F (d) B and D

16. Basic features of the mechanism of inheritance include- **[1]**

(i) Characters are controlled by genes which are located in chromosomes

(ii) There may be two or more forms (alleles) of the genes

(iii) One form may be dominant over the other form

(iv) An organism has two (similar or dissimilar) forms of the gene

(a) (i) and (ii) only (b) (i) , (ii) and (iv) only

(c) (i) and (iv) only (d) (i), (ii) , (iii) and (iv)

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

(b) Both A and R are true, and R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

17. **Assertion (A) :** Metals are sonorous and malleable. **[1]**

Reason (R) : They are generally brittle in solid state.

18. **Assertion (A) :** Mendel picked common garden pea plants for the focus of his research. **[1]**

Reason (R) : Garden pea plants can be grown easily in large numbers and their reproduction can not be manipulated

19. **Assertion (A) :** The height of an object is always considered positive. **[1]**

Reason (R) : An object is always placed above the principal axis in the upward direction.

20. **Assertion (A) :** Glycolysis is the first step of respiration in which glucose completely breaks into CO_2 and H_2O. **[1]**

Reason (R) : Glycolysis occurs in cytoplasm of the cell.

SECTION-B

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

21. (i) Give one word to water soluble base. **[2]**

(ii) Plaster of paris should be stored in a moisture proof container. Why?

OR

Fresh milk has pH of 6. How do you think the pH will changes as it turns into curd? Explain your answer.

22. Define reflex action with suitable examples. **[2]**

23. "Transpiration is a necessary evil". Justify the statement. **[2]**

24. What is the difference between a direct current and an alternating current ? How many times does AC used in India change direction in one second ? **[2]**

25. When does an electric short circuit occur ? **[2]**

26. (i) How do the wall of small intestine adapted for performing the function of absorption of food? **[2]**

(ii) What is the function of salivary glands?

OR

(i) Why is the wall of trachea supported by cartilaginous rings?

(ii) State the role of epiglottis.

SECTION-C

Q. No. 27 to 33 are short answer questions.

27. Give reasons for the following statements:- **[3]**

(a) River water conducts electricity but distilled water does not

(b) We feel burning sensation in the stomach when we over eat

(c) The tarnished copper vessel regains its shine when rubbed with lemon.

28. Mention with reason the color changes observed when:- **[3]**

(a) Silver chloride is exposed to sunlight.

(b) Copper powder is strongly heated in the presence of oxygen

(c) A piece of zinc is dropped in copper sulphate solution

29. (i) Name the organelle in which photosynthesis occurs. Discuss the role of chlorophyll in photosynthesis. **[3]**

(ii) Why bile juice is necessary for digestion?

(iii) State the role of HCl and pepsin enzyme.

OR

(i) Name one nitrogenous waste present in urine.

(ii) What is basic unit of kidney called?

(iii) How is the mount of urine produced regulated?

30. In the following food chain if 20,000 J is available. at producers level then calculate the amount of energy available at next three consecutive trophic levels. **[3]**

Grass → Grass hopper → Frog → Snake

31. If the image formed by a lens for all positions of an object placed in front of it is always erect and diminished, what is the nature of this lens ? Draw a ray diagram to justify your answer. If the numerical value of the power of this lens is 10D, what is its focal length in the Cartesian system ? **[1+1+1=3]**

32. (a) Why do we prefer a convex mirror as a rear-view mirror in vehicles ? **[1+1+1=3]**

(b) Name a mirror that can give an erect and enlarged image of an object.

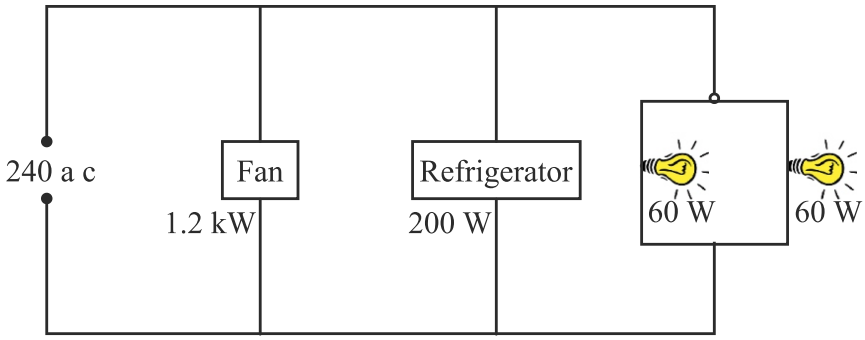
(c) Define 1 dioptre of power of a lens.

33. (a) Draw the pattern of magnetic field lines due to a magnetic field through and around a current carrying circular loop. **[2+1=3]**

(b) Name and state the rule to find out the direction of magnetic field inside and around the loop.

OR

Figure shown a 240 V ac mains circuit to which a number of appliances are connected and switched on. **[1+2=3]**



(i) Calculate the power supplied to the circuit.

(ii) Calculate-

(a) The current in the refrigerator. (b) The energy used by the fan in 3 hours.

(c) The resistance of the filament of one lamp.

SECTION-D

Q. No. 34 to 36 are Long answer questions.

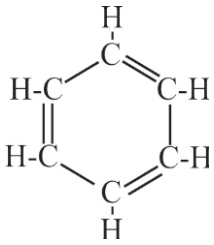
34. (i) Draw two structural isomers of butane. **[5]**

(ii) Draw the structure of propyne and propanone.

(iii) Name the third homologue of (a) alcohol (b) aldehyde

(iv) Name the following

(a)



(b) $CH_3 - CH_2 - CH = CH_2$

(v) Show the covalent bond formation in nitrogen molecule.

OR

Write the chemical equation for the following :-

(i) Combustion of methane (ii) Oxidation of ethanol

(iii) Hydrogenation of ethene (iv) Esterification reaction

(v) Saponification reaction

35. Differentiate between the following – **[5]**

(i) Pollen tube and style

(ii) Fission in amoeba and plasmodium

(iii) Fragmentation and regeneration

(iv) Bud of hydra and bryophylum

(v) Cross pollination and self-pollination.

OR

Mention the function of following-

(i) Testes (ii) Ovary (iii) Fallopian tube

(iv) Prostate and seminal vesicles (v) Placenta

36. (a) An object 1 m tall is placed on the principal axis of a convex lens and its 40 cm tall image is formed on the screen placed at a distance of 70 cm from the object. What is the focal length of the lengs ? **[(1½+½+½+½)+(1+1)=5]**

(b) Define the Radius of Curvature & Center of Curvature of spherical mirror.

OR

(a) Explain with the help of a ray diagram, why a stick partly immersed in water appeared to be bent at the water surface. **[3+2=5]**

(b) Why does a concave mirror has a real principal focus ?

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.

37. On the basis of reactivity metals are grouped three categories:

(i) Metal of low reactivity

(ii) Metal of medium reactivity

(iii) Metals of high reactivity

Therefore metals are extracted in pure form from their ores on the basis chemical properties.

Metals of high reactivity are extracted from their ores by electrolysis of the molten ore.

Metals of low reactivity are extracted from their sulphide ores, which are converted into their oxides. The oxides of these metals are reduced to metals by simple heating. **[1+1+2=4]**

(a) Name the process of reduction used for a metal that gives vigorous reaction with air and water both

(b) Carbon cannot be used as a reducing agent to obtain aluminium from its oxide? Why?

(c) Describe briefly the method to obtain mercury from cinnabar. Write the chemical equation for the reactions involved in the process.

OR

(c) Differentiate between roasting and calcination giving chemical equation for each.

38. Ayush performed an experiment to study the inheritance pattern of genes. He crossed white male rabbit (Homozygous) with black female rabbit (Homozygous) . Hint : Black colour is dominant over white colour. **[4]**

Answer following questions –

(i) What is the result in F1 generation ? Draw cross.

(ii) What are the phenotypes of the offspring of F1 progeny is self crossed. Draw cross.

(iii) What percentage of white coloured rabbits were formed ? what is the reason?

OR

(iii) Define the term genetics and variation . State the law of dominance.

39. A fuse is a device for the safety of appliances and electric circuits against excessive a short circuit or overloading. It has low melting point wire heating during connected to the live wire. Electric fuse wire is a mixture (alloy) of tin (Sn) and lead (Pb) (Sn 63% and Pb 37%). It has high resistance and low melting point so that it may easily melt on over-heating when excessive current is passed through it. The maximum amount of current that can pass through a fuse wire without melting is called current rating of a fuse. **[1+1+2=4]**

(i) Which device is used as protection from over current?

(1) Voltmeter (2) Ammeter (3) Potentiometer (4) Electric fuse

(ii) Define current rating of fuse.

(1) The minimum amount of current that can pass through a fuse wire without melting.

(2) The minimum amount of voltage that can pass through a fuse wire without melting.

(3) The maximum amount of current that can pass through a fuse wire without melting.

(4) The maximum amount of voltage that can pass through a fuse wire without melting.

(iii) In room heater (1000 watt, 220 V), current rating of fuse wire is

(a) 4 A (b) 4.5 A (c) 5 A (d) 5.5 A

OR

(iii) A fuse wire is an alloy of two metals namely

(a) Cu and Sn (b) Sn and Zn (c) Sn and Pb (d) Sn and Ag