Q1. A convex lens forms an 8.0cm long image of a 2.0cm long object which is kept at a distance of 6.0cm from the optical centre of the lens. If the object and the image are on the same side of the lens, find (i) the nature of the image, (ii) the position of the image, and (iii) the focal length of the lens. **3 Marks**

Q2. Name the hormone released and the gland which secretes it in human beings during scary situations. How does the body respond to enable it to deal with the situation? **3 Marks**

Q3. The digestion of food in human alimentary canal is a complex process. State the enzyme/salt present in the following and mention their function in the process of digestion: **3 Marks**

1. Saliva
2. Bile Juice
3. Pancreatic Juice

Q4. What is placenta? Describe its two major functions. **3 Marks**

Q5. If we want to obtain a virtual and magnified image of an object by using a concave mirror of focal length 18 cm, where should the object be placed? Use mirror formula to determine the object distance for an image of magnification +2 produced by this mirror to justify your answer. **3 Marks**

Q6. Some harmful chemicals get accumulated in human bodies through the food chain. Name this phenomenon. Explain the reason of maximum concentration of these chemicals found in our bodies. **3 Marks**

Q7. On the basis of the characteristics of the processes given in the brackets in each case, differentiate between the following: **3 Marks**

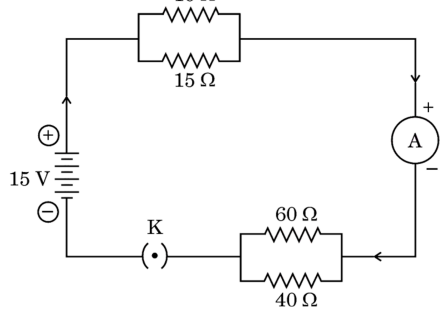
1. breakdown of pyruvate in aerobic and anaerobic of Products
2. respiration in human beings (product(s) of the processes)
3. Respiration and photosynthesis in plants (gas released)
4. Respiration in terrestrial animals and fishes (organs involved)

Q8. A pure pea plant bearing terminal flowers was cross-pollinated with a pure plant having axillary flowers. In F_1 generation, plants with axial flowers only were obtained. F_1 generation plants are self-pollinated and F_2 generation is obtained. **3 Marks**

1. Work out the pattern of inheritance in this case.
2. What will be the ratio of plants obtained in F_2 generation?

Q9. Name the blood vessel that brings (i) oxygenated blood (ii) deoxygenated blood, to the human heart. Also name that chamber of the heart which receives deoxygenated blood and state how deoxygenated blood from this chamber is sent to lungs for oxygenation. **3 Marks**

Q10. Consider the following electric circuit: **3 Marks**



Calculate the values of the following:

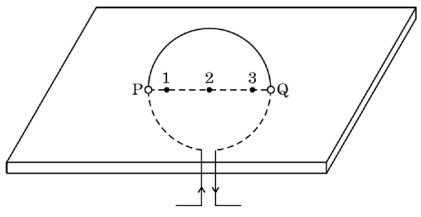
1. The total resistance of the circuit
2. The total current drawn from the source
3. Potential difference across the parallel combination of 10 Ω and 15 Ω resistors.

Q11. 1. What is meant by reflex arc? Where are they formed in the human body? **3 Marks**

2. Why have reflex arcs evolved in animals ?

Q12. Consider a rectangular cardboard having two holes P and Q through which a current carrying circular loop has been inserted as shown in the diagram. **3 Marks**

1. Make this diagram on your answer sheet and draw three magnetic field lines, one each passing through the points 1 (near P), 2 (at the centre of the loop) and 3 (near Q).



1. List two factors on which the intensity of the magnetic field produced at the centre of the loop depends.
2. Name the rule you will apply to determine the direction of magnetic field produced due to a current carrying straight conductor.

Q13. 1. What is a reactivity series of elements? How is it developed? Arrange the following elements as they are arranged in the reactivity series: **3 Marks**

Aluminum, Calcium, Copper, Lead

2. Write balanced chemical equation to show the reaction of iron (|||) oxide (Fe_2O_3) with aluminium.

Q14. 1. Mention the role of the following organs of human male reproductive system: **3 Marks**

1. Testis.
2. Scrotum.
3. Vas deferens.
4. Prostate glands.

2. What are the two roles of testosterone?

Q15 An object is placed at a distance of 20cm from the optical centre of a concave lens and its image is formed on the same side of the lens as the object. If the distance of the image from optical centre of the lens is 10cm, use lens formula to determine (i) focal length, and (ii) power of the lens in new Cartesian sign conventions. **3 Marks**

Q16. 1. Define a double displacement reaction. **3 Marks**

2. Write the chemical equation of a double displacement reaction which is also a (i) Neutralization reaction and (i) Precipitation reaction. Give justification for your answer.

Q17 A green stemmed tomato plant denoted by (GG) is crossed with a tomato plant with purple stem denoted by (gg). **3 Marks**

1. What colour of the stem would you expect in their F1 progeny?
2. In what ratio would you find the green and purple coloured stem in plants of F2 progeny?
3. What conclusion can be drawn for the above observations?

Q18. 1. In human beings the genes inherited from the parents decide whether the newborn individual is male or female." Explain this statement with the help of a flow diagram. **3 Marks**

2. "Some animals rely on environmental cues for sex determination." Justify this statement giving an example.

Q19. The electrical resistivity of three materials A, B and C at 20°C is given below: **3 Marks**

Material	**Resistivity (Ω m)**
A	10^{17}
B	44×10^{-6}
C	1.62×10^{-8}

1. Classify these materials as conductor, alloy and insulator.
2. Give one example of each of these materials and state one use of each material in the design of an electrical appliance say an electric stove or an electric iron.

Q20. The resistance of a wire of 0.01cm radius is 7 ohms. If the resistivity of the material of the wire is 44×10^{-6} ohm meter, calculate the length of the wire. **3 Marks**