PHYSICS

1. A rear view mirror of an automobile has an focal length of 2m. If it locates a person standing at a distance 4m from it, find the nature and distance of the image.

2. An object of height 2 cm is placed at distance $2.5f$ from a concave mirror where f is its focal length . Find the height of the image.

3. A rod of length 10 cm lies along the principal axis of a concave mirror of focal length 10 cm in such a way that the end close to the pole is 20 cm away from it . Find the length of the image of the rod.

4. Two thin biconvex lenses L_1 and L_2 having focal lengths 10 cm and 15 cm, respectively, are placed coaxially. What distance (d) should be maintained between them so that a parallel beam of light parallel to their axis, incident on the lens L_1 emerges from L_2 undeviated? If the distance between them is increased by 'd', at what distance from L_1, on the axis, does the emergent beam converge?

5. Show by a diagram the refraction of two light rays incident parallel to the principal axis on a convex lens by treating it as a combination of a glass slab and two triangular glass prisms.

6. Out of the two lenses, one concave and the other convex, state which one will show the divergent action on a light beam. Draw diagram to illustrate your answer.

7. Which lens is converging:
(i) an equiconcave lens or an equiconvex lens?
(ii) a concavo-convex lens or a convexo-concave lens?

8. State difference between a convex and a concave lens in their
(a) appeerance, and
(b) action on the incident light.

9. Name the two kinds of lens? Draw diagrams to illustrate them.

10. What are the three principal rays that are drawn to construct the ray diagram for the image formed by a lens? Draw diagram to support your answer.

CHEMISTRY

1. Name the acid-base indicator extracted from lichen.

2. Importance of pH in everyday of life.

3. Which gas is liberated when an acid reacts with a metal? How will you test this gas?

4. Why is Oxide of a non- metal called acidc Oxide?

5. Can we dilute conc. H_2SO_4 by adding water to it?

6. Give two industrial applications of sulphuric acid.

7. Point out three chemical properties common to all acids.

8. Explain 'acid, 'base' and 'salt. Give two examples in each case.

9. Write the formula of the salts given below: Potassium sulphate, Sodium sulphate, Magnesium sulphate, Copper sulphate, Sodium chloride, Sodium nitrate, Sodium carbonate and ammonium chloride. Identify the acids and bases from which the above salts may be obtained.

10. Give reason why:
(i) Water should not be added directly to concentrated acid?
(ii) Antacids are required when there is pain or irritation in the stomach?
(iii) Baking soda should be rubbed on bee-stung area?

BIOLOGY

1. If a plant is releasing carbon dioxide and takingin oxygen during the day, does it mean that there is no photosynthesis occurring ? Justify your answer.

2. Name the enzymes present in pancreatic juice.

3. Photosynthesis is the formation of organic food from carbon dioxde and water with the help of sunlight. Actually photosynthesis occurs in two steps?
(a) **Light Reaction:** It is also called as photochemical process. It was discovered by '**Robert Hill**' therefore, it is also called as

Hill's reaction. It is also called as thermochemical reaction.

Site of light reaction is grana of chloroplast.

Raw materials required are light and water. This process is regulated by chlorophyll molecules.

(b) Dark reaction: It was discovered by Melvin Calvin and Benson. Therefore, it is also called Calvin cycle.

Site of dark reaction is stroma of chloroplast.

Raw materials required are CO_2, NADPH, ATP and enzymes.

This process is regulated by Light reaction and enzymes.

(i) How many phases are found in photosynthesis?

(ii) Light reaction is regulated by which pigment?

(iii) Who discovered dark reactions?

(iv) What is the end product of light reaction that also acts as a raw material for dark reaction?

4. Describe the mechanism of breathing in human beings under normal conditions.

5. Is human circulatory system open or closed? Give reason.

6. Write the constituents of blood. Why are white blood corpuscles called soldiers of the body?

7. Categorize animals on the basis of excretory products.

8. Given below is the figure of certain organs and associated parts in the human body , Study the same and then answer the questions that follow:
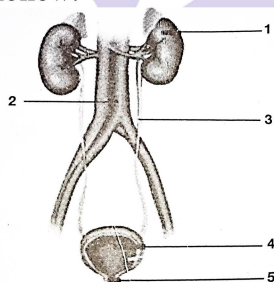
(i) Name the parts numbered 1 to 5.

(ii) Name the structural and functional unit of the part marked '1'

(iii) Name the two main organic constituents of the fluid that flows down the part lebelled '3'

(iv) How the opening of part lebelled as '4' is controlled?

9. Differentiate between tropic and nastic movements in plants.

10. Give term for the following

(i) The movement of plant in the direction of light.

(ii) The movement of plant towards chemical substances.

(iii) The movement of plant towards gravity.

(iv) The movement of plant towards water.

MATHS

1. Prove that $\sqrt{10}$ is an irrational number.

2. The LCM of two numbers is 182 and their HCF is 13. If One of the numbers is a 26, find the other.

3. If one root of the equation $5x^2+13x+k = 0$ is the reciprocal of the other , then find the value of k.

4. If -2 is a root of the equation $3x^2-7x+p =0$,find the values of k for which the roots of the equation $x^2+k(4x+k-1)+p = 0$ are equal.

5. A train covered a certain distance at a uniform speed. If the train would have been 6 km/h faster, it would have taken 4 hours less than scheduled time and if the train were slower by 6 k/m, it would have taken 6 hours more than the scheduled time. Find the distance of the journey.

6. (i) Find the value of a, if the distance between the points A(-3, -14) and B(a, -5) is 9 units.

(ii) Find the point on the x-axis which is equidistant from the points (2, -5) and (-2,9).

7. The vertices of a triangle are (-2,0),(2,3) and (1,-3). Is the triangle equilateral, isosceles or scalene?.

8. Point P divides the line segment joining the points A(2,1) and B(5,- 8) such that $\frac{AP}{PB} = \frac{1}{3}$. If P lies on the line *2x-y+k =0* , find the value of *k*.

9. Find the ratio in which the line 2x+3y -5=0 divides the line segment joining the points (8,-9) and (2,1) .Also find the coordinates of the point of division.

10. A (3,2) and B(-2,1) are two vertices of a triangle ABC, whose centroid G has coordinates $\left(\frac{5}{3}, -\frac{1}{3}\right)$.Find the coordinates of the third vertex C of the triangle.