NEW STANDARD ACADEMY

Marks: 80

Date : 30-06-25 **CLASS : 10TH** **Time: 3 hours.**

PHYSICS

1. Why do we see a rainbow only after rain and when the sun is low in the sky?
2. Why do stars twinkle but planets do not? Explain with the concept of atmospheric refraction.
3. Define power of accommodation of human eye. What is its range for a normal human eye?
4. What is meant by atmospheric refraction? How does it lead to the apparent flattening of the sun at sunrise and sunset?
5. A star appears slightly shifted from its actual position in the sky. Name and explain the phenomenon responsible.
6. What are the differences between rods and cones in the retina? How do they help in vision?
7. What is Tyndall effect? Explain how it is responsible for the blue colour of the sky and reddish appearance of the sun at sunrise and sunset.
8. How does refraction through the atmosphere cause the day to be longer than actual sunlight time?
9. Why does the sun appear reddish at sunrise and sunset? Explain with reason.
10. Describe how the white light of the sun disperses into seven colours. What is the sequence of colours in the spectrum?

CHEMISTRY

1. Classify the following reactions and balance them:

   (a) $CaO + H_2O \rightarrow Ca(OH)_2$

   (b) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$

   (c) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

2. Why do magnesium and aluminium metals develop a dull layer when exposed to air? What type of reaction is this?
3. Explain the difference between a displacement and a double displacement reaction with one example of each.
4. What is a redox reaction? Identify the oxidising and reducing agents in the following reaction:

   $$ZnO + C \rightarrow Zn + CO$$

5. Describe the change observed when a piece of iron is kept in copper sulphate solution. Write the chemical reaction and name the type of reaction.
6. Write the chemical formulae and uses of any four salts used in everyday life.
7. Why does baking soda taste bitter and turn red litmus blue? What happens when it is heated? Write the equation.

   Or

   Write a four comical properties of acid
8. A solution turns red litmus blue. Its pH is likely to be: 1, 4, 7, 10 or 13? Explain your answer.
9. Why does dry HCl gas not change the colour of dry litmus paper while HCl solution does? Explain.
10. Describe how Plaster of Paris is obtained. What happens when it is mixed with water?

    Or

    Write a four comical properties of base

BIOLOGY

1. Why is blood circulation in human heart called double circulation? Name the two types involved.
2. Why are villi present in the small intestine and not in the stomach? Explain.
3. What would happen if the human kidneys stopped functioning? Name the process used to treat this condition.
4. Give the difference between ureotelic and uricotelic animals. With example
5. Draw the labell diagram of extcretory system

6. Differentiate between aerobic and anaerobic respiration. Write one equation for each.
7. How does the process of digestion occur in the human small intestine? Mention the role of enzymes.
8. What will happen if the lining of the small intestine is damaged? Why?
9. How is the energy released during respiration stored and used in the body?
10. What is the role of nephron in excretion? Explain how urine is formed.

MATHS

1. If n is an odd integer, prove that n^2-1 is divisible by 8.
2. If one zero of the quadratic polynomial $x^2 + 4x + k$ is reciprocal of the other, Find the value of k.
3. $P(x) = 2x^2-6x -3$. The two zeros are of the form: $\frac{3\pm\sqrt{k}}{2}$; Where k is a real number use the relationship between the zeros and cofficients of a polynomial to find the value of k.Show your steps.
4. Find the quadratic polynomial whose zeroes are the reciprocals of the zeroes of $3x^2 + 5x +2$.
5. Find a quadratic polynomial whose sum and product of the zeroes are 1/2 and -3 respectively.
6. If the zeroes of the quadratic polynomial $ax^2 + bx + c$ are equal, prove that $b^2 = 4ac$.
7. Without actually calculating the zeroes, find the nature of the roots of the polynomial $x^2 – 2x + 3$.
8. The sum of zeroes of a quadratic polynomial is 4, and the sum of their squares 20. Find the product of the zeroes.
9. If α and β are the zeroes of the polynomial $f(x) = 4x^2 – 4x + 1$, find the value of $\alpha^2 + \beta^2$
10. If α and β are the zeroes of the polynomial $p(x) = x^2 – 5x + 6$, Find a quadratic polynomial whose zeroes are 2α and 2β.