NEW STANDARD ACADEMY

Marks: 80

02-12-2024   CLASS : 9 TH Time: 3 HRS

PHYSICS

1. What is sound and how is it produced?
2. Describe with the help of diagram. How compressions and rare factions are produced in air near a source of sound.
3. A person has hearing range of 20Hz to 20kHz. What are the typical wavelengths of sound waves in air corresponding to these two frequencies?
   Take the speed of sound in air as 344ms^{-1}.
4. Two children are at opposite ends of an aluminum rod. One strikes the end of the rod with a stone. Find the ratio of time taken by the sound waves in air and in the aluminium to reach the second child.
5. A stone is propped from the top ? of a tower 500 m high into a pond of water at base of the tower. When is the splash heard at the top? Given g = 10 ms^{-2} and speed of sound = 340 ms^{-1}
6. A sound wave travels at a speed of 399 ms^{-1}. If its wavelength is 1.5 m what is the frequency of the wave ? Will it be audible?
7. What is reverberation? How can it be reduced?
8. A sonar device on a submarine sends out a signal and receives an echo 5s later. Calculate the speed of sound in water if the distance of the object from the submarine is 3625m.
9. Why are sound waves called mechanical waves?
10. Which wave property determines (a) loudness, (b) pitch?

CHEMISTRY

1. Explain with examples the difference in molecule of an element and the molecule of a compound
2. Explain the term atomicity with examples.
3. What do the following abbreviations describe?
   (i) H   (ii)2H
   (iii) H2   (iv) 2H$_2$
4. What do the following abbreviation denote ?
   (i) N   (ii) 2N
   (m) 3N$_2$ (iii) 4O$_2$
5. What is the atomicity of (a) S$_8$ (b) sodium metal (c) copper metal?
6. What is the significance of the molecular formula CO$_2$?
7. An element X has valency of 4 while the valency of element Y is one. What is the formula of the molecule for between X and Y?
8. The valency of an element (Z) is 3. What is the formula of its (a) oxide (b) sulphide (c) bromide?
9. What is the atomicity of (a) noble gases (b) carbon ?
10. What is the difference between an atom and a molecule?

BIOLOGY

1. Name the cells of cartilage and bone.
2. Why is blood considered a connective tissue?
3. What are simple tissues ? Explain their different types.
4. Give any four examples of the location of cartilage in human body.
5. Differentiate between adipose tissue and areolar tissue
6. Write about the various components of mammalian blood.
7. Classify the different types of animal tissues in tabular form.
8. Describe the structure and functions of epithelium.
9. Classify connective tissue and give one example of each.
10. What are the various functions of bones? How do bones differ from cartilage?

MATHS

11. If $P(x) = x^2 - 4x + 3$, evaluate :
    $p(2) - p(-1) + \left(\frac{1}{2}\right)$

12. If $f(x) = x^4 - 4x^3 + 3x^2 - 2x + 1$ then find whether $f(0) \times f(-1) = f(2)$

13. Check whether 0 and 2 are zeroes of the polynomial $x^2 - 2x$.

14. Find the integral zeroes of the polynomial $x^3 + x^2 + x - 3$.

15. Show by actual division that $2x + 3$ is a factor of $p(x) = 4x^4 + 8x^3 + 5x^2 + x - 3$

16. Divide $p(x) = 2x^3 - 7x^2 + 5x - 8$ by $(x+2)$ and verify your remainder by remainder theorem.

17. What number should be added to $2x^3 - 3x^2 - 8x$ so that the resultant polynomial leaves remainder 10 when divided by $(2x+1)$.

18. Show that $x+2$ is a factor of $x^3 + 3x^2 + 5x + 6$

19. If both $x-2$ and $2x-1$ are factors of $px^2 + 5x + r$, Show that $p = r$.

20. Find the value of m so that $2x-1$ be a factor of $8x^4 + 4x^3 + 16x^2 + 10x + m$.