

# NEW STANDARD ACADEMY

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## PHYSICS

1. What are various branches of mechanics?
2. Are rest and motion relative terms ?
3. When an object is considered as a point object during its motion ?
4. Give one example that shows the negative acceleration can be associated with the speeding up the object.
5. What is the nature of position-time graph for a uniform motion?

## CHEMISTRY

1. Calculate the wavelength of a radiation whose frequency is  $10^{11}$  Hz
2. A radio station broadcasts at a frequency of 1120 kHz. Another radio station broadcasts at a frequency of 98.7 MHz (megahertz). What is the ratio of wavelength of two radio stations?
3. Calculate the range of frequencies of visible light The range of their wavelengths is 3800-7600Å
4. The wavelength range of visible spectrum is 400 nm (violet) to 750 nm (red). Express these wavelengths in frequencies (Hz).
5. Calculate the wave number and frequency of radiation having wavelength of 5800 Å.

## BIOLOGY

1. Select an appropriate chemical bond among ester bond, glycosidic bond , peptide bond and hydrogen bond and write against each of the following.  
(i) Polysaccharide \_\_\_\_\_ (ii) Protein \_\_\_\_\_  
(iii) Fat \_\_\_\_\_ (iv) Water \_\_\_\_\_
2. How are prosthetic group different from co – factors?
3. Starch cellulose Glycogen chitin are polysaccharides found among the following . Choose the one appropriate and write against each.  
Cotton fibre \_\_\_\_\_

Liver \_\_\_\_\_

4. Explain the process of condensation . Give an example using sugars.
5. Why are enzymes important?
6. Nucleic acids exhibit secondary structure justify with example.
7. How does temperature and pH affect enzyme activity?
8. What is the difference between a nucleotide and nucleoside ? Give two examples of each with their structure.
9. Explain the role of active sites on the surface of an enzyme.
10. Match the following with correct combination

Column I	Column II
A Triglycerides	1 Galactose
B Lactose	2 Glycerol
C RNA	3 Palmitic acid
D $\beta$ -pieats	4 Uracil
E Bee wax	5 Secondary structure

## MATH

1. Find the domain and range of the function  $f(x) = \sin^{-1} \frac{x^2}{2}$
2. Find the domain of the function  $f(x) = \sin^{-1}(1+3x+2x^2)$
3. Find the domain and range of the function  $f(x) = \sin^{-1}((1+e^x)^{-1})$ .
4. Find the domain for  $f(x) = \sin^{-1}\left(\frac{1+x^2}{2x}\right)$ .
5. Find the range of  $f(x) = \sin^{-1}x + \tan^{-1}x + \cos^{-1}x$ .
6. Find the domain of  $f(x) = \sqrt{\cos^{-1}x - \sin^{-1}x}$
7. Find the range of  $\tan^{-1}\left(\frac{2x}{1+x^2}\right)$
8. Find the range of  $f(x) = \cot^{-1}(2x-x^2)$
9. Find the range of  $f(x) = \cos^{-1}\left(\frac{\sqrt{1+2x^2}}{1+x^2}\right)$
10. Find the domain of the function  $f(x) = \frac{\sin^{-1}x}{x}$