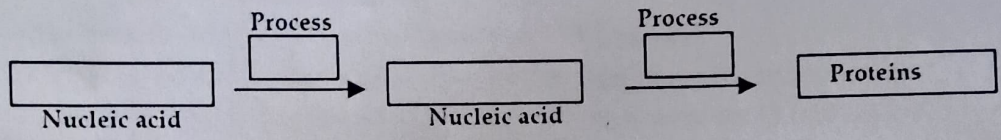
Introduction to Biology: Quiz 1

Course outcomes: CO-1, CO-4 Time: 25 min, Marks: 15

1. What is the difference between Adenosine and Adenine? [1]
2. In samples of DNA isolated from two unidentified species of bacteria, X and Y, adenine makes up 32% and 17%, respectively, of the total bases. What relative proportions of adenine, guanine, thymine, and cytosine would you expect to find in the two DNA samples? [2]
3. Explain the difference between paralogous and orthologous genes. [1]
4. Explain the difference between euchromatin and heterochromatin. [1]
5. What is nucleosome? [1]
6. Fill in all the boxes below: [2]



7. What type of bonds would hold two **adjacent** nucleotides together in a growing nucleic acid chain? [1]

8. 5'GGCCANACCA3' [1]
   For the nucleic acid sequence that is given above
   Which nucleotide base has a free phosphate group?
   Which nucleotide base has a free hydroxyl group?

9. In the table below, name the sub-cellular location or organelle(s) of the eukaryotic cell that will fluoresce when the following macromolecules are tagged with a fluorescent dye. [1.5]

Macromolecules tagged with fluorescent dye	Sub-cellular location or organelle(s) of cell that will fluoresce
Proteins that add carbohydrates or lipids to the newly synthesized proteins	
Proteins that are a part of functional ribosomes	
DNA	

10. Write the term specific to below definitions: [1.5]
    (a) The totality of the genetic information carried in the DNA of a cell or an organism
    (b) Full set of chromosomes of a cell arranged with respect to size, shape, and number.
    (c) Constricted region of a mitotic chromosome that holds sister chromatids together.

11. Explain the processes that contributed to the evolution of new genes. [2]