

**Short Assay questions (10% Each)**

1. There are various form of DNA conformation, i.e., A-, B-, C-, D-, and E-forms. Please distinguish these 5 forms of DNA. What is the function of Z-form DNA?
2. T. Ceck has first shown a biological reaction catalyzed by RNA and not by a protein, and won the Nobel prize in 1983 for the self-catalyzed RNA interactions. Please show the self-catalyzed group I and group II intron splicing.
3. During translation, usually AUG is recognize as the initiation codon. To your knowledge, is there any exception? Please give an example.
4. A new form of life is discovered. It has a genetic code much like that of other organisms except that there are six different DNA bases instead of four and the base sequences are translated as quadrate instead of triplets. How many amino acids could be accommodated by this genetic code?
5. Please describe all the regulations of a gene from active state to inactive state.
6. Please describe the characteristics of a cancer cell (as much as you can).
7. What are the telomerase activity related to an aging cell and to a cancer cell?
8. The hyaluronic acid and proteoglycan combine into molecular superstructures. What are the functions of the known largest biological molecule, HA-GAG, in the extracellular matrix?
9. Centrosome is also named as MTOC. What is MTOC? Which type of cytoskeleton is responsible for radiating of cytoskeleton? How would you prove?
10. The lipid bilayer structure can be either the more highly ordered arrangement of phospholipid as semisolid gel phase, or the bilayers can melt into a fluid state in which individual molecules are free to flex, rotate or exchange places. Please discuss the effects of **cholesterol** on the fluidity of the lipid bilayer.