





Q1. What is crossing over and non disjunction of chromosomes?

Q2. Explain the nucleosome model of DNA packaging.

Q3. How do histones acquire positive charge?

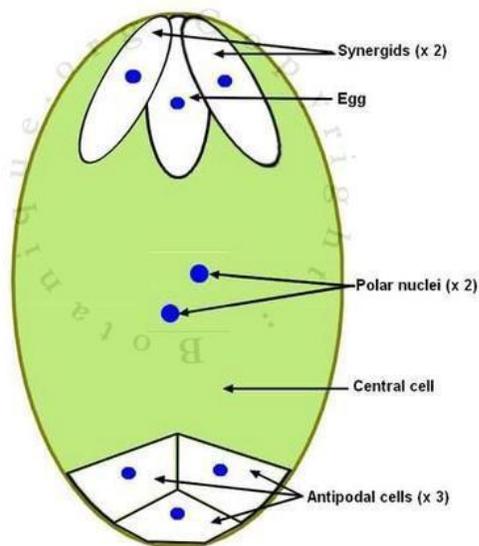
Q4. Explain the steady state and cosmic theory of origin of life.

Q5. What is natural selection? How is artificial selection different from natural selection?

**Section D (Case Based Short answer type questions of 3mark each)**

Q1. Observe the diagram carefully and answer the following questions

- Is it a fertilized or unfertilized embryo sac?
- how many cells & nucleus are there in the embryo sac?
- mention the fate of polar nuclei, synergids and antipodal cells.



**Embryo sac of an Angiosperm**

Q2. Based upon the knowledge of chromosomal abnormalities complete the following table:

Name of Disorder	Reason	Symptoms
Down Syndrome	-	Short statured with small round head, furrowed tongue & partially open mouth, flat back, broad flat face, slanting eyes, broad palms with palm crease, many loops on finger, congenital heart disease, physical, psychomotor & mental retardation
Turner's Syndrome	45 (XO)	

Q3. In a cross between a tall pea plant with yellow seeds (TtYy) and a tall plant with green seeds (Ttyy), what proportion of the offspings could be expected to be:

- a. Tall and green                      b. Dwarf and green

Q4. Given below is the flow diagram of STP:

Primary effluent is passed into large aeration tank



Effluent passed into settling tank to form the sediment

- a). Why primary effluent is passed into large aeration tanks?  
 b). Write the technical term used for the sediment formed? Mention its significance.

Q5. In a series of experiments with *Streptococcus pneumoniae*, Frederic-Griffith concluded that the R-Strain bacteria had some how been transformed by the heat-killed strain.

- (a) If RNA, instead of DNA was the genetic material would heat-killed strain have transformed the R-strain into a virulent one?  
 (b) Give one reason to explain why RNA viruses mutate and evolve faster than other viruses.  
 (c) What are the values shown by the Scientists while doing researches?

**Section E (Long answer type questions of 5mark each)**

Q1. Explain the application of rDNA technology to produce insulin.

- (a) Describe the different steps in one complete cycle of PCR.
- (b) State the purpose of such an amplified DNA sequence

Q2. (a).Describe in sequence the process of microsporogenesis in angiosperms.

- (b). Draw a labelled diagram of a two celled final structure formed.

Q3. (a). What is Central dogma ? Who proposed it ?

- (b). Describe Meselson and Stahl's experiment to prove that the DNA replication is semi-conservative.

Q4. Explain the points that have to be considered for successful bee- keeping?

Q5. Describe how biogas is generated from activated sludge. List the components of biogas.