

**M.D. DEGREE EXAMINATION**  
**BRANCH XIII – BIOCHEMISTRY**  
**PAPER II – CELL PHYSIOLOGY, MOLECULAR BIOLOGY AND**  
**HUMAN GENETICS**

*Q.P.Code: 202044*

**Time: Three Hours**

**Maximum: 100 Marks**

**I. Essay Questions:**

**(2 x 10 = 20)**

1. What are the steps in synthesis of mRNA and its modifications?
2. Describe in detail the types and procedure of gene therapy. Add a note on the advantages and disadvantages of different vectors used.

**II. Short Questions:**

**(8 x 5 = 40)**

1. Steps to separate and identify cell organelles.
2. Biochemistry of blood group antigens.
3. Inhibitors of prokaryotic and eukaryotic DNA replication.
4. Tumor suppressor genes.
5. RFLP.
6. Telomerase and its significance.
7. Human Genome project.
8. Mt DNA – structure, function and clinical significance.

**III. Reasoning Out:**

**(4 x 5 = 20)**

1. Microsatellite instability disorders present with anticipation. Why?
2. Fidelity of gene is conferred by aminoacyl tRNA synthetases. Justify.
3. What is the rationale behind the administration of salt-sugar solution (ORS) in acute diarrhoeal disorders?
4. Why DNA is synthesised in a discontinuous manner in lagging strand?

**IV. Very Short Answers:**

**(10 x 2 = 20)**

1. Golgi apparatus – structure and function.
2. What is the molecular basis of Severe Combined Immunodeficiency?
3. What is u3 RNA? What is its diagnostic significance?
4. What is a nucleosome and what is its role in a cell?
5. What is the exact sequence of phases of cell cycle? What is the significance of each phase?
6. Post translational modification in collagen.
7. What are the components of replication fork?
8. SGLT – types, location and associated disorders.
9. Enumerate any two functions of glycoproteins.
10. BRCA gene.

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