This question paper contains **3** printed pages]

Roll No. | | | | | | | | | | |

S. No. of Question Paper : **7203**

Unique Paper Code : **2493010017**

Name of the Paper : **Molecular Diagnostics**

Name of the Course : **B.Sc. (Hons.) Biochemistry**

Semester : **VIII (NEP)**

Duration : **2 Hours** Maximum Marks : **60**

(Write your Roll No. on the top immediately on receipt of this question paper.)

There are *six* questions.

Attempt any *four* questions. *All* questions carry equal marks.

Question No. **1** is compulsory.

1. (A) Explain the following terms : 12

(*a*) Prognostic markers

(*b*) Point-of-care (POC) testing

(*c*) Sharps waste

(*d*) Allograft

(*e*) GLP

(*f*) SNP.

P.T.O.

(B) Name the scientist responsible for key historic milestones of molecular diagnostics : 3

(*a*) Invented the polymerase chain reaction.

(*b*) The first prenatal molecular diagnosis of α-thalassemia.

(*c*) First-generation DNA sequencing method.

2. (*a*) Explain key guiding principles for Ethical Molecular Diagnostics. 3

(*b*) Highlight the key features of a BSL-4 level lab facility. 3

(*c*) Explain how molecular diagnostics help in early diagnosis of the following diseases : 9

(*i*) Alzheimer's

(*ii*) HIV

(*iii*) Sickle cell anemia.

3. Explain the following markers and their importance in diagnostics : 3×5=15

(*a*) HbA1c

(*b*) cTnI

(*c*) D-Dimer

(*d*) CRP

(*e*) BNP.

4. (*a*) What is Karyotyping ? Explain the key features used to identify chromosomes for karyotyping. 5

(*b*) Explain the various types of chromosomes banding techniques. 5

(*c*) Explain the maternal serum screening markers for early prenatal diagnosis of down syndrome. 5

5. (*a*) Give the importance of HLA typing in organ transplantation. 5

(*b*) Explain the *two* phenotypic methods used for HLA typing. 5

(*c*) Explain the various types of graft rejection. 5

6. Briefly explain the following techniques and their importance in diagnostics : 3×5=15

(*a*) Chromosomal microarrays

(*b*) Next generation sequencing

(*c*) FISH

(*d*) RFLP

(*e*) Multiplex PCR.