Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Science
End Sem Examination Dec-2023
FS3EL05 Forensic Genetics

Programme: B.Sc. Branch/Specialisation: Forensic Science

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. The first ever human hormone produced by recombinant DNA technology is_____. **1**
(a) Progesterone (b) Insulin (c) Estrogen (d) Progesterone

ii. The first recombinant DNA molecule was synthesized in the year_____. **1**
(a) 1962 (b) 1972 (c) 1982 (d) 1992

iii. Which one is an example for chromosomal mutation? **1**
(a) Sickle cell anaemia (b) Muscular dystrophy
(c) Phenylketonuria (d) Klinefelter's syndrome

iv. Which of the following has a strong structure with beads on it? **1**
(a) Chromosomes (b) Heterochromatin
(c) Chromatin (d) Nucleosomes

v. Which enzyme is used to break down the cell membrane during DNA extraction? **1**
(a) Protease (b) Lipase (c) RNase (d) Lysozyme

vi. Which of this factor is not responsible for thermal denaturation of DNA? **1**
(a) PH (b) Temperature
(c) Ionic strength (d) Humidity

vii. DNA Fingerprinting relies on- **1**
(a) Difference in patterns of genes between individuals
(b) Difference in order of genes between individuals
(c) Difference in junk DNA patterns between individuals
(d) All of these

viii. Specific biomolecules which show easily detectable difference among different strains of a species or among different species is termed as- **1**
(a) DNA fingerprinting (b) Molecular markers
(c) Molecules scissors (d) RFLP

ix. Which human chromosomes has the highest density of STR? **1**
(a) Chromosome 1 (b) Chromosome 21
(c) Chromosome 19 (d) Chromosome 16

x. Which residue is abundant in STR? **1**
(a) Adenine (b) Guanine (c) Cytosine (d) Thymine

Q.2 i. What is Chargaff's rule? **2**

ii. Write the Mendelian principle of independent assortment and principle of segregation with example. **3**

iii. Explain the organization of DNA in chromosomes. **5**

OR iv. Describe the Recombinant DNA technology and its application in forensics. **5**

Q.3 i. Write a short note on chromosomal mutation. **2**

ii. Explain the steps involved in central dogma of genetics. **8**

OR iii. Throw a light on chromosomal mapping and karyotyping. **8**

Q.4 i. What is DNA purification? Why is it important in DNA extraction? **3**

ii. Elaborate the conventional methods of DNA extraction from blood & tissues. **7**

OR iii. Explain the common methods used for DNA quantitation. **7**

Q.5 i. Define northern blotting. **4**

ii. Throw a light on RFLP technique in detail. **6**

OR iii. Discuss the history and development of DNA fingerprinting. **6**

Q.6 Attempt any two:

i. Write a note on Hardy-Weinberg law and its significance in forensic genetics. **5**

ii. Explain the PCR and its application in detail. **5**

iii. Differentiate between mt-DNA Analysis and Y-STR analysis. **5**

******