B.Sc. BIOTECHNOLOGY
SECOND SEMESTER (REPEAT)
BIOSTATISTICS & BIOINSTRUMENTATION
BBT-204

(Use separate answer scripts for Objective & Descriptive)

Duration: 3 hrs. **Full Marks: 70**

[PART-A : Objective]

Time: 20 min. **Marks: 20**

Choose the correct answer from the following: ***1X10=10***

1. Different methods give different average which are known as the
   a) Measures of central tendency b) Statistics
   c) Measures of dispersion d) Skewness

2. Calculated ${}^{n}C_{r}$ if n=10 and r=2
   a) 45 b) 46 c) 42 d) 40

3. What is the chance that a leap year selected at random will contain 53 Sundays?
   a) 1/7 b) 2/7 c) 3/7 d)None

4. Coefficient of quartile deviation is calculated by the formula
   a) $\frac{(Q_3 + Q_1)}{4}$ b) $\frac{(Q_3 + Q_1)}{2}$
   c) $\frac{(Q_3 - Q_1)}{(Q_3 + Q_1)}$ d) None of the above

5. Coefficient of variation is calculated by the formula
   a) $\frac{\bar{X}}{\sigma} X\ 100$ b) $\frac{\bar{X}}{\sigma}$
   c) $\frac{\sigma}{\bar{X}} X\ 100$ d) None of the above

6. When one regression coefficient is negative then the other would be
   a) Negative b) Positive
   c) 0 d) Infinity

7. If A and B are two mutually exclusive event then P(A∩B) is
   a) 1 b) φ c) 0 d) -1

8. Algebraic sum of deviations of a set of values taken from their mean is always
   a) Zero b) one
   c) Average d) median

9. Which of the following is non-probability sampling?
   a) Purposive sampling b) Random sampling
   c) Cluster sampling c) Stratified sampling

10. Which of the following term best describes data what were originally collected at an earlier time by a different person for a different purpose?
    a) Primary b) Secondary
    c) Experimental d) Field notes

State True or False: ***1X5=5***

1) In centrifugation heat is generated in high speed rotation.
2) In chromatography the particles having high molecular weight move faster.
3) The principle of electrophoresis is the migration of a charged particle under the influence of an electric field.
4) In two dimensional paper chromatography some remaining buffer is used for separation of the substrate.
5) An alpha particle is equivalent to a Helium nucleus.

Match the following: ***1x5=5***

a) Isoelectric point (pI)	i) radioactive isotope
b) Nuclear medicine	ii) combination of lenses
c) Compound microscope	iii) bromophenol blue
d) Specimen	iv) isoelectofocussing
e) Electrophoresis	v) slide

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(PART-B : Descriptive)

Time: 2 hrs. 40 min. **Marks: 50**

[Answer question no.1 & any four (4) from the rest]

1. What is electrophoresis? Explain gel electrophoresis. Briefly explain isoelectric focussing. (2+5+3=10)
2. a) What is Isoelectric point? Write the different applications of Isoelectrofocussing.
   b) Find quartile deviation and coefficient of quartile deviation for the given grouped data. (5+5=10)

Class	frequency
1-10	3
11-20	16
21-30	26
31-40	31
41-50	16
51-60	8
Total	100

3. a) Describe briefly about techniques and applications of electron microscope.
   c) What do you mean by centrifugation? Give a short description of different types of centrifuges known to you. (5+5=10)
4. a) Write the properties of alpha and beta particles and gamma radiation.
   b) Explain the basic principle of chromatography. (5+5=10)
5. a) What is meant by correlation? Distinguish between positive, negative and zero correlation with suitable Example.
   b) State the differences between ionizing and non-ionizing radiation. (5+5=10)
6. What are fluorophores? Describe Jablonski energy diagram. How does fluorimeter works? (2+5+3=10)
7. What do you mean by scintillation? Explain the types of scintillation counting with diagram. (5+5=10)
8. Write the basic principle of thin layer chromatography. Explain the procedure of TLC. Also write its application. (3+5+2=10)

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