Q.P. Code : 30059

[Time: 3 Hours] **[Marks: 100]**

Please check whether you have got the right question paper.

N.B:
1. **All questions are compulsory.**
2. **All questions carry equal marks.**
3. **Draw neat and labelled diagrams wherever necessary.**

Q.1 A) Fill in the blanks by choosing correct option given in the brackets. **05**

a. _____ denotes one part per 1000 parts (ppm, ppt, ppb)
b. _____ is the gram molecular weight of solute dissolved in one kilogram of solvent (Normality, Molarity, Molality)
c. _____ method of transgenesis is used to insert the DNA fragment into the embryonic stem cell. (Cloning, DNA microinjection, Embryonic stem cell transplant)
d. Cystic fibrosis can be cured using _____ method. (Surgical, Yogic, Gene therapy)
e. _____ instrument is used to measure the hydrogen ion concentration in the solution. (pH meter, Electrophoresis, Thin layer chromatography)

B) Match the column I with II and rewrite: **05**

I	II
a) Biohazardous material	i) Nitrates
b) Green Fluorescent Protein	ii) Retrovirus Vector
c) Oxidizing agents	iii) Chromatography
d) Transgenesis	iv) Virus
e) Resolution factor	v) *Aquorea victoria*

C) State whether **true or false:** **05**

a. A solution is a homogenous mixture.
b. The temperature values in Fahrenheit scale and Celsius scale are indicated differently for the same solution.
c. DNA fingerprinting method can be used to identify the fingerprint pattern.
d. Compound microscope can be used to magnify upto 10,000X.
e. When transmittance in 100%, the absorbance is zero.

D) Answer in **one sentence** **05**

a. Define Normality.
b. Define Population.
c. What are the VNTRs in DNA fingerprinting?
d. Give one example of *ex vivo* gene therapy.
e. Name any 2 types of chromatography.

Q.2 A) Describe briefly median and mode along with their merits and demerits. **10**

OR

A) Describe briefly physical hazards and biological hazards.

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B) Answer **any two** of the following: **10**

a. Explain simple, subdivided and multiple bar diagram.
b. Describe simple random sampling.
c. Write a note on histogram.
d. Explain good laboratory practices.

Q.3 A) Describe the applications of biotechnology in the field of fishery and animal husbandry. **10**

OR

A) Describe the method of DNA fingerprinting and its applications.

B) Write short notes on **any two** of the following: **10**

a. DNA microinjection method.
b. Cloning of Dolly.
c. Achievements of biotechnology in medicine.
d. Gene therapy for SCID.

Q.4 Answer **any two** of the following: **20**

a. Write the principle and applications of centrifuge.
b. Write the principle and applications of colorimeter.
c. Explain the components of compound microscope and its applications.
d. Describe principle and applications of spectroscopy.

Q.5 Write short notes on **any four** **20**

a. Toxic and corrosive chemicals.
b. Normality.
c. Applications of Green fluorescent protein.
d. Explain agarose gel electrophoresis.
e. Dissecting microscope.
f. Scope of biostatistics.

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