

**B.Sc. 5<sup>th</sup> Semester (Hons.) Examination, 2021 (CBCS)**

**Subject: Zoology**

**Paper: DSE-1**

**(DSE-T1: Animal Biotechnology)**

**Full Marks: 40**

**Time: 2 Hrs**

*Candidates are required to give the answers in their own words as far as practicable.*

Answer any **eight** questions of the following:

5×8=40

1. Mention the principle, procedure and applications of DNA fingerprinting technique.
  2. Write short notes on the following:
    - i) DNA microarray
    - ii) Cystic fibrosis
  3. Compare briefly among Southern and Northern blotting techniques with their applications and limitations.
  4. Describe briefly the steps of retroviral and DNA microinjection methods for the production of cloned and transgenic animals.
  5. Mention the principle and procedure of Sanger's di-deoxy method of DNA sequencing.
  6. Explain blunt end cut and staggered end cut with diagram. What are the special features of restriction endonuclease? What do you mean by recognition sequence?
  7. Write down the steps for the construction of cDNA library. What is plaque hybridization?
  8. What is *taq* polymerase? What do you mean by RT-PCR? Write down the steps for PCR.
  9. What do you mean by knockout mice? Describe the process by which knockout mouse is produced.
  10. Explain primary and secondary cell culture. What is the difference between normal cell and transformed cell? Explain log phase for animal cell culture.
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**(DSE-T2: Microbiology)**

**Full Marks: 40**

**Time: 2 Hrs**

*Candidates are required to give the answers in their own words as far as practicable.*

Answer any **eight** questions of the following:

5×8=40

1. Describe the structure of cell wall of Gram-positive bacteria with schematic diagram.
  2. How does the bacterial chromosome differ from a eukaryotic one? Give your input on the statement - “Cosmids can carry larger DNA segments than the Plasmids”.
  3. State the basic principles of Acid-Fast staining. How is it different from the Gram Staining?
  4. What are Viroids? How do they differ from the Viruses? In what way does a prion appear to differ fundamentally from viruses and viroids?
  5. State three major criteria on the basis of which Whittaker divided organisms into five kingdoms. What is the basis of ‘Three Domain Classification’ system followed by Carl Woese? Enumerate major differences between the above-mentioned two schools of thoughts.
  6. Write the differences between exotoxins and endotoxins. What are the different categories of exotoxins in relation to bacterial pathogenesis?
  7. What do we mean by ‘normal flora’ in human body? What are their functions? Are they harmful to us?
  8. Describe briefly selective media and enriched media of bacterial culture with suitable examples.
  9. What is the difference between Hfr and F’ (F prime) strains? What are the steps of bacterial transduction?
  10. Write the name of causative agent of AIDS. Briefly describe the symptoms and preventive measures of the disease.
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