



বিদ্যাসাগর বিশ্ববিদ্যালয়

**VIDYASAGAR UNIVERSITY**

**B.Sc. Honours Examination 2021**

(CBCS)

**4th Semester**

**BIOTECHNOLOGY**

**PAPER—SEC2T & SEC2P**

*Full Marks : 40*

*Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

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

**THEORY : SEC2T ( MOLECULAR DIAGNOSTICS )**

**Group - A**

Answer any *one* question.

1×15

1. What is the principle of immunoassay? What is a heterogenous immunoassay? What are the limitations of an ELISA? Discuss the applications of enzyme immunoassay in diagnostic microbiology.

5+3+3+4

2. What is plasmid finger printing? Describe the procedure and applications of plasmid finger printing.

2+(7+6)

3. Write short note on Coombs test. Write the applications of monoclonal antibody. What are the roles of knock-in and knockout technologies in transgenic animal production? 5+5+5
4. Differentiate reverse-transcriptase PCR and real-time PCR. Mention the advantages of PCR over RFLP. What are advantages of using multiplex-PCR over monoplex-PCR in molecular diagnostics? 5+5+5

**Group - B**

Answer any *one* question. 1×10

5. Write down the principle of HPLC. What is the difference between HPLC and GC? 5+5
6. State the principle of electron microscopy (EM). State the differences between SEM and TEM. State the applications of EM. 3+5+2

**PRACTICAL : SEC2P**

Answer any *one* question. 1×15

1. Describe the principle and procedure of RFLP. Discuss different types of restriction endonuclease with suitable example. (5+5)+5
2. Discuss the principle and procedure of Widal test for detection of microbial infections. What is enteric fever? What is the route of transmission and symptoms of enteric fever? (5+4)+2+4
3. Discuss the principle, procedure and the probable diagnostic approaches of any one of the following: Dengue or Malaria. 4+7+4

—

**THEORY : SEC2T ( BASICS OF FORENSIC SCIENCE )****Group – A**Answer any *one* question.

1×15

1. What are the principles of DNA profiling? How is DNA fingerprinting used for profiling and forensic analysis? What is the application of DNA fingerprint? 5+5+5
2. What are medico-legal aspects of injuries? What are the types of injury? What is difference between wound and injury? What are eDiscovery softwares? 4+6+3+2
3. What are the importance and application of forensic chemistry and toxicology in the investigation and detection of crimes and criminal justice? What are the three main objectives to toxicological investigations? What is the importance of evidence in criminal investigation? 5+5+5
4. What is cyber security? What are the types of cyber-crime? What are the different types of Internet threats? 3+6+6

**Group – B**Answer any *one* question.

1×10

5. What are individual characteristics of handwriting? What is importance of handwriting? What is handwriting forgery? 4+3+3
6. What are the types of firearms? What is the difference between interior and exterior ballistics? How can firearms and bullets be used as evidence? 4+3+3

**PRACTICAL : SEC2P**Answer any *one* question.

1×15

1. Discuss how do you simulate a crime scene for training and how do you lift footprints from the crime scene. 7.5+7.5
2. Discuss the principle, requisites and procedure of separation of nitro compounds from ink samples by thin layer chromatography. 5+5+5
3. State the principle and procedure of PCR. How can it be used in forensic science ? 5+7+3

—