

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

M.Sc.-II Semester (BT)

COURSE CODE (CREDITS): 20MS1BT215 (02)

MAX. MARKS: 25

COURSE NAME: Molecular Diagnostics

COURSE INSTRUCTORS: Dr. Jitendraa Vashistt

MAX. TIME: 1 Hour 30 Min.

*Note: (a) All questions are compulsory. (b) Marks are indicated against each question in square brackets.*

- Q1. A bacterial pathogen has a characteristic of acid fast staining and high amount of mycolic acids in its membrane. This bacterial pathogen usually causes a highly contagious respiratory associated disease. Identify above mentioned bacterial pathogen and its associated disease and also elucidate a method of its molecular identification in human host. (4 marks)
- Q2. A boy consumed contaminated water from a source and after few days, he suffered from diarrhea with rice water look stools, severe dehydration, nausea and vomiting. On microscopic examination a comma shaped bacterial pathogen is seen. Identify this organism and disease and also explain the precautionary measures and treatment regime for the same. (4 marks)
- Q3. Wherever a bacterial pathogen needs to be identified, amplification and sequencing of a conserved gene/gene segment is usually considered. Identify this gene and explain the method of molecular identification of a bacterial pathogen using this gene. (4 marks)
- Q4. How do you differentiate between *E.coli* K12 and Enterohemorrhagic *E.coli* on the basis of genetic makeup? Which of these above mentioned bacteria is pathogenic in terms of infection caused? Justify your answer. (4 marks)
- Q5. Explain the principle design and method for utilization of 'FISH' for identification of a molecular target in the genome. (4 marks)
- Q6. Define the similarities and dissimilarities between PCR and RT-PCR on the basis of their functional principles, usage and cost. Justify your answer with suitable molecular diagnostics of a disease/pathogen. (5 marks)