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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2026

M.Sc.-II Semester (BT & Microbio.)

COURSE CODE (CREDITS):24MS1BT211 (3)

MAX. MARKS: 25

COURSE NAME: Molecular Diagnostics and Forensic Biology

COURSE INSTRUCTOR: Dr. Jitendraa Vashistt

MAX. TIME: 1 Hour 30 Min

Note: (a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems. (c) Use of calculators is not allowed.

Q.No	Question	Marks
Q1	Define the following in brief. a) DNA triplet repeats and their significance in neurological disorders. b) Use of fluorescent based detections in molecular diagnostics	5
Q2	How do you detect the causative pathogen using molecular diagnostic methods, if the genome of pathogen is RNA? Explain the method of identification of pathogen using suitable example	5
Q3	A person was suffering from enteric fever and clinician recommends him a class of antibiotic which can inhibit bacterial replication. You need to identify the causative organism, the antibiotic prescribed and its molecular target. Also explain the phenomenon of antibiotic resistance which may be developed by bacteria, if course/dosage of antibiotic is not fully completed.	5
Q4	You get a cultured bacterial sample from a diseased person and clinician suspected the chances of bacterial infection. How do you proceed for identification of this bacterial pathogen using molecular biology methods? Explain the principle of molecular identification.	5
Q5	Usually molecular diagnostic methods utilize the gene based markers for PCR, RTPCR etc. However protein biomarkers can also be utilized for the detection of disease. Explain a protein based molecular strategy if you need to identify a potential protein biomarker for a specific population of diseased persons with respect to normal population. Justify your answer with a suitable example.	5