JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATIONS-2022

M.Tech-II Semester (BT)

COURSE CODE (CREDITS): 20MS1BT215 (2) MAX. MARKS: 35

COURSE NAME: Molecular Diagnostics

COURSE INSTRUCTORS: Dr. Jitendraa Vashistt MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in brackets.

1. Human genome contains the repetitive nucleotide repeat expansions sites. Are these sites a definite number or wide spread with different numbers? If these sites show alteration in their nucleotide repeat expansions, then what are genetic complications arise? **[4]**
2. A person showed a clinical presentation of polyuria and polydipsia. He also had altered blood glucose profile, sores that are slow to heal and unexplained weight loss. What will be your advice to the person for diagnosis of disease and also explain the molecular mechanism for progression of the disease in the person? **[5]**
3. A molecule is considered as guardian of the genome. Identify this molecule, the disease which may be progressed due to its alteration? Also, explain how mdm2 protein has a regulatory role on the above mentioned molecule? **[5]**
4. a) If an anticancer drug is synthesized then what should be the aim for cancer cell removal; Apoptosis or necrosis and why? **[2]**

   b) Why it is mandatory to use the negative and positive control in a PCR reaction during molecular detection? **[3]**
5. If a person was suffering from enteric fever/typhoid and on molecular detection, it was found that a bacterial pathogen is responsible. Clinician advised the patient quinolones group of antibiotics. What would be significance of the specific antibiotic prescription? Explain the molecular mechanism of action this antibiotic. **[5]**
6. How will you design an experimental method using proteomic approach, if you need to identify the specific proteins which are differentially express in the cancer patient population with reference to health population? Explain the factors which must be in consideration during the design of comparative method and identification of specific markers. **[5]**
7. How will you differentiate between the active TB and latent TB? Why latent TB is more worrisome as compared to active tuberculosis? **[3]**
8. If you want to label chromosomes (or portions) with fluorescent molecules, then which of the technique is best suited for labeling carbon 13 labeling or 'FISH'? Why probes are required for this technique? **[3]**