Sr. No. of Question Paper: **Roll No……**

Unique Paper Code : 216651

Name of the Course : B.Sc. (P) Life Sciences

Name of the Paper : Applied Biology and Biotechnology

Semester : VI

Duration : 2 Hours

Maximum Marks: 75

Instruction of Candidates

1. Write your Roll No. on the top immediately on the receipt of this question paper.
2. Attempt any **Four** questions.

Q1. a) If you are provided with a serum sample isolated from a patient's suspected with dengue virus, which is an ssRNA virus. Which molecular technique would be the most appropriate for diagnosis of the patient?. Explain the underlying principle and detailed methodology. **(6)**

b) If we want to characterize the different infecting strains of the virus, how it can be achieved. **(6)**

c) Later on with further diagnosis, it was observed that this patient is also infected with cancer, and technician diagnosed him with relative gene expression pattern profiling. What technique he might have used. Name the technique, its principle, procedure and other applications. **(6.75)**

Q2. a) A particular site is contaminated with high toxic pesticide called Endosulfan. For the decontamination of this pesticide from soil, fungus and bacterial formulation is used. What biotechnological approach is referred here? Name the two types of process and its detailed mechanism used in such techniques on site and off site treatment and applications.

(6)

b) If you want to grow genetic engineering Bt crop plants, then name the plant transformation method to be followed for introducing the gene into the plant cells. Which part on the Ti plasmid does help to transfer and integration of the DNA?

(8)

c) Write Ethics and regulation of GM organism. **(4.75)**

Q3. a) If a gene is cloned into the expression vectors, how can we check the protein profile after its expression? **(6)**

b) After expression and screening the protein patterns, how can we analyze and identify target protein from a mixture of proteins. Which method will you suggest to know the expression of a particular gene up to the level of transcription?

(8)

c) If you want to produce the large amount of stable messenger RNA and thereafter proteins. Which kinds of vector are to be used? Draw a well labeled diagram and discuss its different properties.

(4.75)

Q4. a) Identifying the disease, write about its causative agent and pathogenicity. Explain various treatment and prevention method in the following two cases separately:

i) Patient A has symptoms like blood in stool, diarrhea and abdominal cramp.

ii) Patient B has symptoms like chest pain, fever, blood in sputum and night sweating. **(6+6)**

b) When food is contaminated by organisms, harmful chemicals and toxins. After consumption of such food, the chemicals or toxins enters the body through stomach and intestines and causes infection. Name the disease; discuss the infecting bacteria with their symptoms and risk control methods.

(6.75)

Q5. a) A person is lacking circulating mature T and B lymphocytes in blood. Suggest the possible therapy in this case and abnormality caused by this defect. Draw a well labeled diagram to explain the process. **(9)**

b) A person and his family members are showing very high levels of circulating LDL cholesterol in their blood. Suggest the possible therapy and abnormality caused by this defect. Draw a well labeled diagram to explain the process.

(9.75)

Q6. a) A person is showing high levels of glucose in his blood with symptoms like frequent urination, thirst and excessive hunger. Name the disease and explain the recombinant method in detail with diagrams for production of therapeutic agent required in this case. **(10)**

b) DNA from three different individuals are treated with Cvn1 restriction enzyme and gives the following results. Identify the genotype of three individuals. Comment upon the technique and disease and suggest other technique based on PCR to identify a genetic disease with single base pair or single mutation.

(8.75)