
Note: All questions are compulsory. Marks are indicated against each question in square brackets. All questions of one section should be attempted at one place.

PART A

1. A person had a complication due to the autosomal recessive disease that is caused by a mutation in conductance regulator protein in cells. He has also get complications of chronic Sino-pulmonary disease. Explain, how the genetic factor of specific gene mutation influences the disease in the above mentioned person? [4]
2. A person showed an altered profile of liver function test with higher amount of bilirubin total and jaundice. He also showed the clinical presentation of pale stool, dark urine and loss of appetite. A battery of serological tests were used for the diagnosis of disease and found australian antigen positivity. What was the possible causative agent and explain the molecular mechanism of disease? [4]
3. There is a problem due to the inherited muscle-wasting disease which is caused by genetic mutations on the X-chromosome with a clinical presentation of muscular weakness of the hips, inability to run and a characteristic set of muscle cell degeneration etc. On clinical examination, muscle-specific proteins into the bloodstream. Explain the disease and its possible cause. [4]

PART B

4. a) Which isotope is commonly used to tag an antibody in RIA? [1]
b) What are taqman probes? How do they help in specific and sensitive detection of products in real-time PCR reaction? [2]
c) How the Time-resolved fluorescence Immunoassay (TR-FIA) is different from RIA? [2]
d) What is the importance of negative and positive control in a PCR reaction? [2]
e) What is the difference between specificity and sensitivity when doing a method? [2]

5. Serial two-fold dilutions of a patient's serum have prepared. The dilutions were tested for the presence of antistreptolysin-O (ASO) antibody in a neutralization assay. Dilutions 1:1 through 1:16 showed no hemolysis. While dilutions 1:32 through 1:128 exhibit hemolysis. How will you interpret the result? [2]
6. Differentiate between following: [4]
- Inverse and Multiplex PCR
 - RIA and ELISA
-
7. List the advantages of serological test. [2]
8. What are the major limitations of viral isolation methods for diagnosis purposes? [2]
9. Restriction profile of two strains has been provided. Construct gel electrophoresis diagram and discuss how can you use the profile for identification of polymorphism. [4]

