

COURSE CODE (CREDITS): 21MS1MB312 (3)

MAX. MARKS: 15

COURSE NAME: DIAGNOSTIC MICROBIOLOGY AND VACCINES

COURSE INSTRUCTORS: Dr. Rahul Shrivastava

MAX. TIME: 1 Hour

*Note: (a) All questions are compulsory. (b) Marks are indicated against each question in square brackets. (c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.*

Q1. Three series of precipitation reactions were performed simultaneously with concentration of antigen and antibody as provided below: [2]

- A. Antibody = 1.0 M; Antigen = 1.0 M
- B. Antibody = 2.0 M; Antigen = 2.0 M
- C. Antibody = 0.5 M; Antigen = 0.5 M

Draw the three precipitin curves that would be obtained, in a single graph. Discuss the position of the curves obtained.

Q2. In a Double Diffusion experiment no precipitation band/arc was observed after incubation of the antigen and antibody. Discuss the possible reasons / conditions for non-formation of the band. [2]

Q3. Explain the following:

[1.5 X 2 = 3]

- a. Prozone Phenomenon
- b. Zeta Potential

Q4. With respect to sandwich ELISA explain the following:

[1 X 5 = 5]

- a. Role of blocking buffer.
- b. Need of repeated washing steps after each incubation step.
- c. Use of PBST as a washing agent.
- d. Advantage of tagging enzyme label to secondary antibody.
- e. Application of using a polyclonal capture antibody.

Q5. You have been provided with a soluble protein antigen. Design a precipitation or agglutination based diagnostic method to detect the presence of the antigen in a patient sample. Enlist all steps with their brief description. [3]