Enroll No. _____

Shree Manibhai Virani and Smt. Navalben Virani Science College (Autonomous)

Affiliated to Saurashtra University, Rajkot

SEMESTER END EXAMINATION NOVEMBER – 2016

M.Sc. Biotechnology

16PBTCC03 - MICROBIOLOGY

Duration of Exam – 3 hrs ***Semester – I*** ***Max. Marks – 70***

Part A (5x2= 10 marks)

Answer **ALL** questions

1. Differentiate between enrichment and selective media. Give an example of each.
2. Expand the terms DGGE and ARDRA.
3. Familial Down's syndrome is caused due to trisomy of _____ chromosome while Edwards syndrome is caused due to trisomy of _____ chromosome.
4. The protein present in capsid of influenza virus that act as proton pump is
   a. M1 b. M2
   c. P1 d. P2
5. Match the following organism with their symbiotic partners

Organism	Symbiotic partner
1. Anabaena	A. Leguminous plants
2. Rhizobium	B. Alnus tree
3. Frankia	C. Azolla
4. Glomus	D. Plant root

Part B (5X5 = 25 marks)

Answer **ALL** questions

6a. Describe the classification of bacteria based on carbon, energy and electron sources used by them for fulfilling their nutrient requirements.

OR

6b. Describe the methods for establishing continuous culture.

7a. What are molecular chronometers. Discuss the advantage of using 16S rRNA gene as a chronometer.

OR

7b. List the criteria used for microbial classification in Bergy's Manual of Systematic Bacteriology.

8a. Describe the Cre-Lox mechanism of gene targeting.

OR

8b. Explain the regulation of Lac operon in presence and absence of lactose.

9a. Describe the Baltimore classification of viruses.

OR

9b. List out the biotechnological applications of archaea.

10a. Describe the design and operating principle of microbial fuel cell.

OR

10b. With an example explain the mechanism of quorum sensing in bacteria.

***Part C* (5X7 = 35 marks)**

Answer **ALL** questions

11a. List out different culture techniques that can be used for cultivation of bacteria.

OR

11b. Discuss in details various methods available for measuring microbial growth.

12a. Describe in detail at least two methods based on 16S rRNA gene analysis used for analyzing bacterial diversity.

OR

12b. Discuss advantages and disadvantages of culture dependent and culture independent methods for analyzing bacterial diversity.

13a. With help of a diagram explain the mechanism of competence development in *B. subtilis* and important proteins involved in DNA uptake.

OR

13b. Explain the genetic control of lytic and lysogenic cycle of bacteriophage lamda. Draw genetic map highlighting important components involved in this mechanism.

14a. With the help of diagram explain the structure of HIV virus. Describe its life cycle in details.

OR

14b. List out different types of extremophiles and describe in details the mechanism of tolerance in two different extremophilic groups.

15a. Describe the different steps of nitrogen cycle with the help of diagram and the role of important groups of bacteria involved in each step.

OR

15b. Describe the major classes of antifungal agents and their mode of action.