Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016

Subject Code:2131407 **Date:04/01/2017**

Subject Name:Basic Food Microbiology

Time:10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks**

MARKS

Q.1 **Short Questions** **14**

1. Who first described microorganisms such as bacteria?
2. Name the scientist who suggested 5 kingdom classification.
3. Who gave the concept of variolation
4. What is the term used for a person specialized in study of fungi is known as _____
5. Give an example of acid fast bacterium.
6. Give an example of photoheterotrophic bacterium.
7. Suggest an application of VP test.
8. Which blotting technique is used for RNA
9. Name the scientist/s who gave the concept of conjugation
10. Give examples of purine nitrogenous bases
11. Enlist (in sequence) the reagents used in gram staining
12. What is the type of image formed by microscope
13. During electrophoresis DNA moves towards which electrode (cathode or anode) and why?
14. During recombination, name the junction formed during cross over.

Q.2	**(a)**	What do you understand by primary and secondary metabolites? Explain with examples	**03**
	(b)	Draw flowchart to depict the steps of western blotting technique	**04**
	(c)	Describe the difference between gram +ve and gram –ve bacteria	**07**
		OR	
	(c)	Describe the difference between prokaryote and eukaryote	**07**
Q.3	**(a)**	Draw broth tubes to depict the growth of microorganisms in broth on the basis of oxygen requirement. Label each tube.	**03**
	(b)	Draw a flowchart to depict the scheme of five kingdom classification based on characteristics.	**04**
	(c)	Justify the comment "Louis Pasteur is aptly known as Father of microbiology"	**07**
		OR	
Q.3	**(a)**	Describe the significance of microorganisms in agricultural field.	**03**
	(b)	Describe the concept of IMViC test. Suggest how it helps in differentiating enteric bacteria	**04**
	(c)	Draw a diagram to depict the growth phases of microorganisms. Describe characteristics of each phase. Derive the microbial generation time equation.	**07**
Q.4	**(a)**	What is bradytrophic and auxotrophic microorganism? Draw a diagram to isolate auxotrophic microorganism	**03**
	(b)	Draw a diagram to depict a typical PCR cycle. How can we detect the PCR product? What is the significance of Taq polymerase?	**04**

(c) A chef prepared a coconut cream pie without washing his hands and contaminated the pie with 500 cells of *S. aureus*. He didn't even refrigerate the pie for 6 hrs. **07**

i. What would be the generation time if the final no. of cells is 3 million (3×10^6).

ii. What would be the no. of cells if the chef didn't refrigerate for another 2 hours.

OR

Q.4 **(a)** While evaluating a milk sample from local dairy, 253 colonies were observed in 8th dilution. The plates were prepared by spread plating. Calculate the microbial cell count in terms of Log cfu/ml. **03**

(b) Draw a flowchart to explain Griffith experiment of bacterial transformation of "R" into "S" strain. **04**

(c) A flesh eating *Streptococcus pyogenes* divides every 10 minutes at body temperature. During an injury a soldier got infected with 5 cells of *S. pyogenes*. The soldier could not get any medical attention for 4 hours. What would be the final no. of bacteria cells ravaging his body? **07**
Let's say that for every 1 million bacteria, a centimeter of flesh is consumed. After 4 hours, how much tissue would be lost?

Q.5 **(a)** Enlist various methods to control microorganisms using any three physical agents. **03**

(b) What is the difference between HFr and F' plasmids? What is the outcome of a cross between HFr and F-? Draw diagram to depict conjugative transfer of plasmid DNA. **04**

(c) Draw flowchart depicting steps of ELISA. What is sandwich ELISA? Suggest few applications, advantages and disadvantages of ELISA. **07**

OR

Q.5 **(a)** What are the advantages of detecting microorganisms in foods using molecular methods **03**

(b) Describe koch postulates in form of flowchart. Explain why these postulates were a landmark in clinical microbiology. **04**

(c) Draw a diagram to depict the steps of transduction. What is the difference between generalized and specialized transduction? **07**