Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2141402 **Date: 08/06/2017**

Subject Name: Food & Industrial 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.**

Q.1 (a) **14**

1. What is F value?
2. What is the indicator organism for steam sterilization and pasteurization
3. What is the glycerol percentage to preserve microorganism at -196°C
4. Name the microbial causative of ropiness in milk and milk products
5. Name the reagent used for screening beta galactosidase production by microorganisms
6. Why is it necessary to denature bioethanol
7. Name the type of fimbrae used by E.coli strain for infection in humans
8. During infection due to exotoxin _____ cyclase is involved
9. Name the organism used for production of citric acid
10. Endotoxin results in production of _____ from pituitary glands which results in fever
11. Give an example of physical agent used for control of microorganisms in food industry
12. Name the salt used for salting-in and salting-out
13. Give an example of affinity column and tagged protein
14. Give an example of secondary biointoxication

Q.2 (a) Explain types of pasteurization methods especially the time and temperature combination. **03**

(b) Draw a diagram to depict infection caused by *Vibrio cholerae* **04**

(c) Describe the concept and application of D value. Determine the D value for given data obtained by treating a microbial culture at 80°C for 20 min using an appropriate graph. **07**

time	cfu/ml
0	12320000
2	4924000
5	1002000
8	250200
10	92000
15	10720
20	924

OR

(c) Describe foodborne infection. Draw diagrams to depict infection caused by serotypes of *E. coli*. **07**

Q.3 (a) A bacterial cell divides every 15 minutes. The initial no. of cells is exactly 10000 bacterial cells. After 3 hours, how many bacteria are present? **03**

(b) The beta galctosidase is genetically regulated by Lac operon. Explain the genetic regulation of operon responsible for production of beta galactosidase in case of **04**

1) only glucose present 2) only lactose present 3) both glucose and lactose present 4) both glucose and lactose absent

	(c)	Explain the concept of 2dimensional electrophoresis. Justify that 2 D gel electrophoresis is better than 1D electrophoresis	**07**

OR

Q.3	**(a)**	Draw a well-illustrated schematic diagram to depict the sub parts and probes of a fermenter	**03**
	(b)	Draw a flowchart to indicate the production of citric acid. Enlist its properties and applications.	**04**
	(c)	Draw a flow chart to represent purification and recovery of proteins based on size, polarity, solubility, and binding.	**07**
Q.4	**(a)**	Draw a flowchart to depict differential centrifugation.	**03**
	(b)	Explain how low temperature is effective in reducing microbial load in foods?	**04**
	(c)	What is bioethanol? How it is advantageous in comparison to gasoline? Enlist substrate for bioethanol production. Describe the steps by which bioethanol is produced on large scale.	**07**

OR

Q.4	**(a)**	Enlist factors affecting efficacy of heat treatment in foods	**03**
	(b)	Explain the purification of proteins on the basis of solubility	**04**
	(c)	Discuss the microbial spoilage of canned products? What is the significance of 12D concept for packaging and processing of canned products?	**07**
Q.5	**(a)**	Enlist sources of contamination in milk during milking of cows, transport and storage.	**03**
	(b)	Describe affinity elution chromatography. How does it differ from affinity elution chromatography?	**04**
	(c)	Describe the defects in milk and milk products. Enlist the microorganisms responsible for these defects and their activity responsible for specific defect.	**07**

OR

Q.5	**(a)**	Write a short note on food preservation using chemicals.	**03**
	(b)	Enlist difference between exotoxin and endotoxin	**04**
	(c)	Enlist the microbial causatives of spoilage of fruits and vegetables	**07**

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