Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2141402 Date:23/11/2016

Subject Name:Food & Industrial Microbiology

Time:02:30 PM to 05:00 PM Total Marks: 70

Instructions:

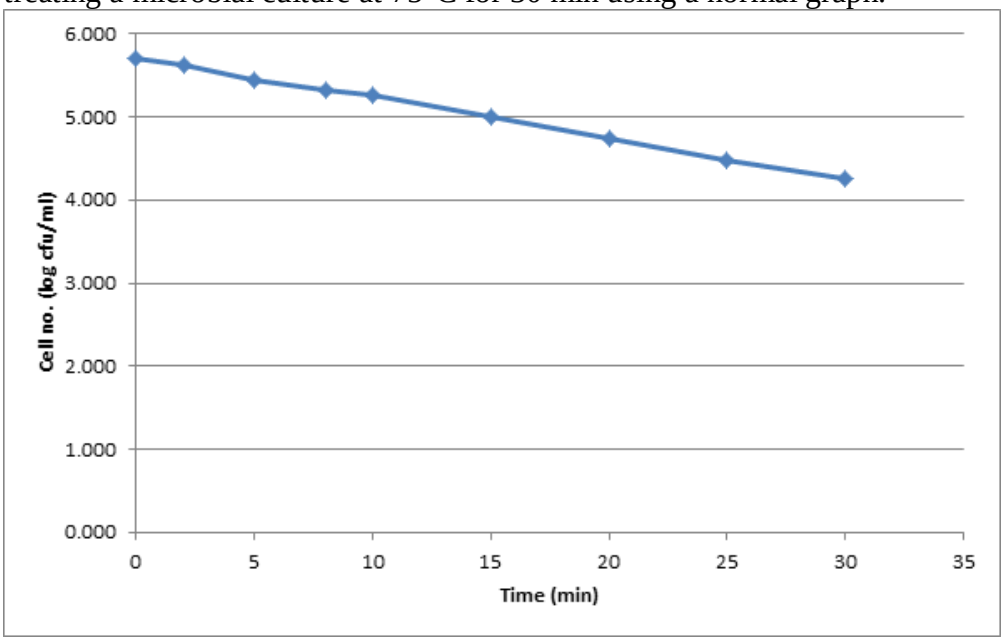
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** 1. Name the microorganism used for Citric acid production at commercial level **14**
2. Write the function of sparger
3. Which of microbial metabolite is an antibiotic, primary or secondary and why?
4. Bacteriocin is produced during which phase of microbial growth?
5. Bengal famine was a result of which food spoilage by microorganism
6. Why is it necessary to denature bioethanol
7. Write the complete chemical name X-gal
8. Organism used for bioethanol production _____
9. Enlist three sources/ substrates used for bioethanol production
10. Citric acid is produced from microorganism _____
11. Antifoaming agent used in fermentation is _____
12. Diarrhea is symptom of which type of toxin, exo or endotoxin
13. Example of organism producing exotoxin _____
14. Name the components plotted on X axis and Y axis used for determining Z value

Q.2 **(a)** Draw a flowchart to depict the steps involved in infecting the host by *Salmonella*. **03**

(b) Enlist the microorganisms (genus and species name in tabular format) responsible for the microbial defects in milk and milk products. **04**

(c) Describe the concept and application of D value. Also explain the concept of 12D, F value and Z-value. Determine the D value for given data obtained by treating a microbial culture at 75°C for 30 min using a normal graph. **07**



OR

(c) Draw a diagram to depict the mechanism of action of AB type of microbial toxins. Give two examples of bacteria producing AB type toxin and disease **07**

caused by them.

Q.3	**(a)**	Describe types of chemicals/ preservatives used for preventing food spoilage	**03**
	(b)	Write short note on physical method to control micro organism in food industry.	**04**
	(c)	Describe spoilage of vegetables and fruits by microorganisms.	**07**
		OR	
Q.3	**(a)**	Describe a method to isolate amylase producing microorganisms. Which reagent is used to detect the presence of starch?	**03**
	(b)	Explain methods to preserve microorganisms for long term and short term storage.	**04**
	(c)	Draw an illustrated diagram depicting various parts of a fermenter.	**07**
Q.4	**(a)**	Explain types of pasteurization methods especially the time and temperature combination.	**03**
	(b)	Write short note on affinity elution chromatography	**04**
	(c)	Describe merits of bioethanol over gasoline. Draw a flow chart to depict the production of bioethanol.	**07**
		OR	
Q.4	**(a)**	Describe the concept, significance and production details of single cell protein.	**03**
	(b)	Explain the difference between One and two dimensional gel electrophoresis	**04**
	(c)	Draw a flowchart to indicate the production of citric acid. Enlist its properties and applications.	**07**
Q.5	**(a)**	What is the significance of strain development and improvement?	**03**
	(b)	You have a culture with 400 cells in it. It is going through exponential decline at a rate of 50% die-off per minute. After three minutes, how many viable cells do you have left.	**04**
	(c)	What is exopolysaccharide? Describe an experiment to screen the microorganism producing exopolysaccharide. Give one application of each exopolysaccharide and capsular polysaccharide in dairy foods.	**07**
		OR	
Q.5	**(a)**	Draw a schematic graph indicating the growth phases of microorganisms. What is the difference between primary and secondary metabolite. Give example of each type of metabolite.	**03**
	(b)	Calculate the final number of bacterial cells in a cup of milk after 200 minutes at room temperature if there were originally only 5 bacterial cells present (the generation time for bacteria considered here is 20 min)	**04**
	(c)	What is lactose intolerance? Describe how Beta galactosidase enzyme can help in preparing products for lactose intolerant people. Also explain the genetic regulation of operon responsible for production of beta galactosidase in case of 1) only glucose present 2) only lactose present 3) both glucose and lactose present 4) both glucose and lactose absent	**07**

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