

Roll No.

--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 02

Total No. of Questions : 08

M.Tech. (Bio Tech.) (2018 Batch) (Sem.-1)
BIOPROCESS ENGINEERING & TECHNOLOGY

Subject Code : MTBT-103-18

M.Code : 75764

Time : 3 Hrs.

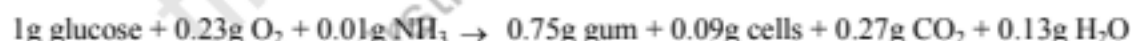
Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWELVE marks.

1.
 - a) What do you understand by the term "Fed-batch culture."
 - b) Explain the unstructured product formation kinetics with relevant expressions.
2. Xanthan gum is produced using *Xanthomonas campestris* in a batch culture as per following reaction stoichiometry. A medium containing glucose and ammonia dissolved in 20,000 litres of water is pumped into the CSTR fermenter and inoculated with *X. campestris*. Air is pumped; the off gas recovered during the entire batch is 1250 kg. The final gum concentration is 3.5 wt%.

Reaction stoichiometry per unit mass of glucose:



- a) Prepare a flow sheet for Xanthum gum production with necessary labeling.
 - b) Prepare a calculation (mass balance) table demonstrating inlet and outlet stream
 - c) What is the percentage of excess air?
 - d) How much glucose and ammonia are required?
3.
 - a) Derive an expression for thermal death kinetics.
 - b) Discuss the design, types of continuous sterilizers with their flow diagrams and temperature-time profile curves.
4.
 - a) Define the volumetric transfer coefficient (K_{La}) of a fermenter.





- b) Discuss any one method in detail determining the $K_L a$ value along with suitable diagrams.
5. Explain various process parameters monitored and controlled in a fermenter.
6. Give a detailed account of several techniques used for cell disruption.
7.
 - a) Discuss the process of crystallization.
 - b) What are the different parameters considered before crystallising a compound?
8. Write short notes on following :
 - a) Ultrafiltration
 - b) Liquid liquid Extraction

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

