Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name: Bioprocess Technology

Subject Code: 4LS04MBO2/4SC04BPT1 Branch: B.Sc. (Microbiology)

Semester: 4 Date: 16/05/2016 Time: 02:30 To 05:30 Marks: 70

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a) Define the term fermentation.
b) Give two examples of mechanical fermenter.
c) What do you mean by induced mutation?
d) Name the microbial culture used for amylase production.
e) Which fermentation technique can be used for immobilized cell?
f) Write the full forms of RPM & RCF.
g) What is the role of precursors in fermentation media?
h) Define synchronize culture.
i) Give two advantages of air lift fermenter.
j) Define terbidostat.
k) Name substrates used in solid state fermentation.
l) Name bacterial culture used in vitamin B 12 production.
m) What is the role of sparger in fermenter?
n) Which type of fermenter is used for acetic acid production?

Attempt any four questions from Q-2 to Q-8

Q-2 Describe batch, fed-batch, continuous and SSF modes of operation for fermentation in detail. **(14)**

Q-3 Discuss various methods for downstream processing for product recovery. **(14)**

Q-4 **Attempt all questions** **(14)**

a) Discuss typical fermentation process for penicillin production. **(7)**
b) Describe various methods for cell disruption for intracellular products. **(7)**

Q-5		**Attempt all questions**	**(14)**
	a)	Define hydrodynamic type of fermenter and explain deep jet fermenter in detail.	**(7)**
	b)	Explain strategies of microbial strain improvement and discuss role of any two mutagenic agent.	**(7)**
Q-6		**Attempt all questions**	**(14)**
	a)	Discuss the role of temperature, dissolved oxygen, foam and pH on monitoring and control of fermentation process.	**(7)**
	b)	Write a note on sterilization and maintenance of aseptic conditions for fermentation media.	**(7)**
Q-7		**Attempt all questions**	**(14)**
	a)	Write a note on photo bioreactor.	**(5)**
	b)	Write the roles of buffers and antifoaming agent in the design of fermentation media.	**(5)**
	c)	Describe scale up processes in fermentation industries.	**(4)**
Q-8		**Attempt all questions**	**(14)**
	a)	Discuss the chemostat in fermentation process.	**(5)**
	b)	Write a note on SCP – single cell protein.	**(5)**
	c)	Draw a labeled diagram of a typical fermenter.	**(4)**