

Reg.No. _____

**Karunya UNIVERSITY**(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)**Supplementary Examination – June – 2017****Code : 14BT2015****Duration : 3hrs****Sub. Name : BIOREACTOR ENGINEERING****Max. marks : 100****ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Write short notes on 1) Degrees of reduction 2) Yield coefficient 3) Elemental balance 4) Respiratory quotient	CO-1	20
(OR)				
2.	a.	$C_6H_{12}O_6 + aO_2 + bNH_3 \rightarrow cC_6H_{10}NO_3 + dCO_2 + eH_2O$ Find the stoichiometric coefficients, biomass and product yield coefficient and degree of reduction for substrate and biomass for the given biological reaction when RQ = 1.44?	CO-1	20
3.	a.	Discuss in detail about batch growth kinetics and derive the kinetic expression for various stages of growth.	CO-1	20
(OR)				
4.	a.	Derive the expression for various types of toxic compound inhibition model	CO-1	20
5.	a.	Explain in detail about various methods to determine K_{La} ? List out the disadvantages of using sulphite oxidation and gassing out methods.	CO-2	20
(OR)				
6.	a.	Discuss in detail the role of aeration and agitation in oxygen transfer and various types of aerators and agitators used in fermentation process	CO-2	20
7.	a.	Explain the bioreactor consideration of fluidized bed bioreactor with a neat sketch.	CO-2	20
(OR)				
8.	a.	Explain the working and principle of various air lift loop bioreactor also state its advantages and disadvantages	CO-2	20
<u>Compulsory:</u>				
9.	a.	Elaborate on the basic configuration of fermentor and ancillaries with a neat diagram	CO-3	20

ALL THE BEST