

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012

Subject code: 170404**Date: 27/12/2012****Subject Name: Bio Process Engineering - I****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

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

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|------------|------------|---|-----------|
| Q.1 | (a) | Explain different kinetic models in detail. | 10 |
| | (b) | Explain different valves which are most commonly used for ON/OFF applications. | 04 |
| OR | | | |
| Q.2 | (a) | What is effect of medium and culture rheology on $K_L a$? | 07 |
| | (b) | Enlist basic functions of a fermentor. | 07 |
| OR | | | |
| | (b) | Draw a neat and labeled diagram of a bioreactor. | 07 |
| OR | | | |
| Q.3 | (a) | Explain different fluid rheologies | 08 |
| | (b) | Write a short note on Pressure control valves and safety valves. | 06 |
| OR | | | |
| Q.3 | (a) | Explain dynamic modeling of fermentor system. | 08 |
| | (b) | Explain different Transport phenomena in a bioprocess | 06 |
| OR | | | |
| Q.4 | (a) | Explain any four different designs of fermentation vessels | 08 |
| | (b) | What operations can be performed to achieve aseptic conditions and containment during fermentation? | 06 |
| OR | | | |
| Q.4 | (a) | Explain different designs of agitator with a neat and labeled diagram. | 08 |
| | (b) | Explain different valves which are most commonly used for all sterile uses. | 06 |
| OR | | | |
| Q.5 | (a) | Explain radial and axial flow impellers. | 08 |
| | (b) | Write a short note on artificial neural network. | 06 |
| OR | | | |
| Q.5 | (a) | Explain black box model. | 08 |
| | (b) | What objectives should be considered for designing fermentation control system? | 06 |
