DMM-1804
M. Sc. Microbiology (Sem. IV) Examination
April/May – 2016
MB-402 : Bioprocess Engineering
(Old Course)

Time : 3 Hours] [Total Marks : 70

Instructions :

(1)

(2) Figures to the right indicate full marks of the question.

(3) Draw neat and labelled diagrams whenever necessary.

1 Answer the following : (any two) 18

(a) Describe in detail pipes and transfer lines.

(b) Elaborate on different types of gassing devise used in bioreactor.

(c) Describe the components of agitation system.

2 Answer the following : (any two) 18

(a) Discuss in detail the rheological properties of fermentation broth.

(b) Explain the law of viscosity. Describe the different types of non-newtonian fluids.

(c) Discuss the derive the equation of heat transfer system.
3  Answer the following: (any two)  
(a) Describe the dynamic method of KLA determination.  
(b) Discuss in detail the liquid-liquid mass transfer.  
(c) Discuss the transfer of oxygen from gas bubble to cell and derive the equation of oxygen transfer rate.  

4  Write short notes: (any two)  
(a) PID control  
(b) Control of bioprocess parameters.  
(c) Applications of biosensor in bioprocess monitoring.