

**2017**

**M.Sc.**

**3rd Semester Examination**

**MICROBIOLOGY**

**PAPER—MCB-303**

*Full Marks : 40*

*Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

*Separate answer scripts to be used for each group.*

**Group — A**

**[Marks : 20]**

Answer any *two* questions.

1. What do you mean by fluid mixing ?

Elucidate the physical factors responsible for fluid mixing.

*(Turn Over)*

How Newton's law of viscosity is applied to fluid mixing ?

When an aerobic fermenter of capacity 600 litres is supplied with a flow of 320 g/min of  $O_2$ , only 0.5% of supplied  $O_2$  gets solubilized in the medium and the growing *Azotobacter* sp. utilizes another 3.5% of supplied  $O_2$ . Calculate the mass transfer to the headspace, assuming 20% headspace and sp. gravity of air being 0.63.

1+3+3+3

2. What is the role of baffles in a bioreactor ?

How does the inoculum is utilized in industry for long-term purposes.

Differentiate an airlift fermenter with a bubble column reactor.

When a genetically modified strain of *pichia pastoris* is used to obtain a drug TVR-10, the sp. growth rate of the strain is  $0.34 \text{ hour}^{-1}$  the production of drug is calculated as 17.3% (w/w) of biomass of the cells and the initial biomass in the batch was found to be 1.026 kg. Calculate the amount of TVR-10 obtained after the end of a 5 hour batch.

2+2+3+3

3. Write notes on any *four* of the following : 4×2.5

- (a) Reynold's number ;
- (b) Batch culture ;
- (c) Fluidized Bed Bioreactor ;
- (d) Scale-up of Bioprocess ;
- (e) Mass Transfer ;
- (f) Steady-state kinetics.

**Group — B**

[Marks : 20]

Answer any *two* questions.

1. (a) What do you mean by food spoilage ? Give example of any three spoilage organisms responsible for milk spoilage.
- (b) Mention any three methods of food preservation used extensively ?
- (c) What do you mean by fermented foods ? Give any two examples with its mode of preparation.

(1+1)+4+(1+3)

2. Briefly describe the food borne diseases caused by following micro-organism.

(i) *E.coli* ;

(ii) *Salmonella*.

(b) What do you mean by mycotoxins ? How mycotoxins deteriorate the food quality and taste ?

(c) Write the molecular bactericidal mechanism of Nisin.

3+3+4

3. Write notes on any *four* of the following : 4×2.5

(a) Production and Application of citric acid ;

(b) Food hazards ;

(c) GMO in food industry ;

(d) FDA ;

(e) Lactic acid bacteria.

---