

(d) Describe the importance of microbes in agriculture with example.

(e) Describe about the industrially important microbes involved in the production of various important products providing sufficient examples.

(f) Describe briefly about batch and continuous fermentation process.

Geas píobaireachd anns a' gairid (b)

(e) Design-type test of microscope is as follows

Wusmer has three of the following:

(a) Designing QOD: How can we determine QOD

Wife sues ex-boyfriend for access to poodles (d)

What is the difference between a live and a dead embryo?

Total number of printed pages-4

BOTANY

(Honours Elective)

Paper : BOT-HE-6016

(Industrial and Environmental Microbiology)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following : $1 \times 7 = 7$

- (a) What was the first organic acid manufactured in a larger scale ?
- (b) What are baffles ?
- (c) Name the microorganisms involved in the production of cyclosporin A.

Contd.

(d) Which media is used to isolate cellulose degrading bacteria ?

(e) Which of the following is free-living nitrogen-fixing bacteria present in the soil ?
 (i) *Azotobacter*
 (ii) *Nitrosomonas*
 (iii) *Rhizobium*
 (iv) *Pseudomonas*

(f) _____, an industrial effluent, was notoriously responsible for Minamata incident occurred in Japan.

(g) Numbers of ATP molecule required for nitrogen fixation is _____.

2. Answer the following in short : $2 \times 4 = 8$

(a) What is biosparging ?
 (b) What is abyssal zone ?
 (c) What is enzyme immobilization ?
 (d) What do you mean by Lyophilization ?

3. (i) Answer any three of the following : $5 \times 3 = 15$

(a) Mention the components of a typical bioreactor.

(b) Write down the preparation and methodologies on antibiotic penicillin production.

(c) Describe various steps involved in casein hydrolysis.

(d) Describe briefly about enumerations of microbes in air.

(e) Describe the role of microbes in sewage treatment.

4. Answer any three of the following : $10 \times 3 = 30$

(a) Define COD. How can we determine COD in polluted water ? Describe briefly.

(b) Write an essay on process of biological nitrogen fixation.

(c) What are different methods of enzyme immobilization ?