Date & Time: 05-Dec-2018 (02:00 PM - 05:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.
Specialization: Pharmaceutical Biotechnology
Date: 05-12-2018
Bioprocess Engineering and Technology [PBT-MPB103T]

Marks: 75 **Duration: 180 mins.**

SECTION - A

Answer all the questions.

Answer the following (10 marks x 5 = 50 marks)

1) Enumerate the basic functions of an Industrial fermenter (any four) and discuss aeration-agitation system, emphasizing on spargers and impellers (10)

2) Discuss the production of Penicillin by fermentation process and its recovery (10)

3) Enlist the methods for sterilizing air. Discuss the Humphrey-Gaden approach in the design of depth filters. Add a note on testing standards for air purity. (10)

4) What are the difficulties in scale up of fermentation processes? How are these overcome by scale down approach? (10)

5) Enlist different techniques for immobilization of enzymes. Describe the technique, application and limitation for any two methods. (10)

SECTION - B

Answer all the questions.

Answer the following (5 marks x 5 = 25 marks)

6) Fermentation broth undergoes different rheological changes during a typical fermentation. Explain these changes, citing examples. (5)

7) How is reverse osmosis different from dialysis? Explain. (5)

8) Give an account of Gate valves and globe valves (5)

9) Classify sensors and enumerate any four parameters for their evaluation (5)

10) Why are homofermentative organisms preferred over heterofermentative organisms for the production of Lactic acid? Briefly outline its production by fermentative process. (5)

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