

Code: 9A23802

R09

B.Tech IV Year II Semester (R09) Advanced Supplementary Examinations, July 2013

BIOPROCESS ECONOMICS AND PLANT DESIGN

(Biotechnology)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Write short notes on process design.
(b) Explain in detail the considerations to be made in carrying out technical feasibility survey.
- 2 (a) Write short notes on the importance of the following in plant operation and control:
(i) Instrumentation.
(ii) Storage.
(b) Write a detailed note on plant layout.
- 3 Explain in the following in detail that constitute the breakdown of fixed capital investment for a chemical/biochemical process.
(a) Direct costs.
(b) Indirect costs.
- 4 Explain the following:
(a) Variable production costs.
(b) Fixed charges.
- 5 (a) Write short notes on source of capital.
(b) For the case of a nominal annual interest rate of 20% per year, determine:
(i) The total amount to which \$1 of initial principal would accumulate after 1 year with daily compounding and the effective annual interest rate.
(ii) The total amount to which \$1 of initial principal would accumulate after 1 year with continuous compounding and the effective annual interest rate.
- 6 (a) What is depreciation? Explain the various methods to calculate depreciation.
(b) Write short notes on salvage value and service life.
- 7 Write short notes on the following:
(a) Return on investment.
(b) Payback period.
(c) Net return.
(d) Replacements.
- 8 (a) Explain in detail about optimization applications.
(b) Define and explain about objective function.
