

IV B.Tech. I Semester Regular Examinations, November -2005
BIO PROCESS ECONOMICS AND PLANT DESIGN
(Bio-Technology)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Discuss on the development of technical feasibility report stating the different sources of data acquisition. [16]
2. One of the main technical factors in plant design report is the set of flow diagrams. Explain giving different flow diagrams used, method of development of these diagrams. [16]
3. (a) Distinguish between Market survey and Market research with reference to marketability of product.
(b) State different factors that affect the product cost. [10+6]
4. (a) Compare and contrast the fixed capital with working capital.
(b) Write on types of depreciation. [10+6]
5. (a) Elaborate on the important safety considerations in the process industries.
(b) Distinguish between interest rate and rate of return. [10+6]
6. (a) Define overheads in a process plant. How are costs of overheads service classified and accounted?
(b) What is risk? How is it related to uncertainties? How is it accounted? [8+8]
7. (a) Discuss in detail on the importance of optimization applications in a process industry.
(b) Bring out the difference between linear programming and dynamic programming. [8+8]
8. Write short notes on any four of the following:
 - (a) Optimization techniques
 - (b) Patent rights and royalties
 - (c) Government regulations for location of a plant
 - (d) Intellectual property rights
 - (e) Fixed costs Vs variable costs. [4×4]

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1. Write on the necessity of developing a technical feasibility report. Briefly discuss on the various components in such report. [16]
2. What are the different resources that are to be considered while locating a process plant. State the importance of each. [16]
3. Define capital. State and explain various categories of capital considered and accounted. [16]
4. (a) Distinguish between direct and indirect manufacturing costs.
(b) What is depreciation? How does depreciation affect the rate of return. [8+8]
5. "Safety is a necessary cost" enumerate with special emphasis to health and fire. How does safety improve efficiency of a process? [16]
6. (a) Explain the term "Payout period" as applicable to the profitability of a process.
(b) Distinguish between different types of interest rates. [8+8]
7. (a) Write on the differences between optimization techniques and optimization strategies in a process industry.
(b) State and briefly explain the linear programming application in a plant management. [8+8]
8. Write short notes on any four of the following:
 - (a) Royalties
 - (b) Patents
 - (c) Utilities
 - (d) Intellectual property protection
 - (e) Waste disposal [4×4]

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1. Explain briefly the importance of the following in preparing the design report:
 - (a) Specifications
 - (b) flow sheet
 - (c) research and development
 - (d) plant location [16]
2. (a) Distinguish between government regulations and government restrictions.
(b) State and explain the different factors that affect the marketability of a product. [8+8]
3. (a) Compare and contrast fixed costs with variable costs in a process industry.
(b) Write briefly on the estimation of fixed capital investment required for a process industry. [8+8]
4. (a) What are the factors that are taken for working capital. Explain their contribution.
(b) Write on the importance of maintenance and repair costs. [10+6]
5. Write on the necessity of product cost estimation; how is it estimated? [16]
6. (a) How are the industrial wastes classified? State and explain the various options available for waste disposal.
(b) Compare rapid write off depreciation with slow write off depreciation method. [10+6]
7. (a) Write briefly on the opportunity for future development Vs uncertainty.
(b) How is the profitability of a venture capital investment assessed? [8+8]
8. Write short notes on any Three of the following:
 - (a) Intellectual property
 - (b) Administration costs
 - (c) Storage costs
 - (d) Site selection
 - (e) Insurance. [16]

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1. Write in detail on the necessary data required to prepare the technical feasibility. What are the various methods to obtain the data? State the sources. [16]
2. (a) What is working capital? How is it related to direct and indirect manufacturing costs? Give examples.
(b) State with examples the various factors that constitute the fixed capital investment. State and explain 6/10 rule. [10+6]
3. (a) Discuss in detail on utilities servicing stating the various utilities required in a process industry.
(b) What are the different options available in disposing various types of wastes generated in an industry? Explain briefly. [8+8]
4. (a) What are the responsibilities of administration in a process plant? What are the costs associated with this?
(b) Explain the various methods of profitability estimation? How is the uncertainty accounted in this? [6+10]
5. (a) What are the overheads? Compare the overheads with auxiliary services.
(b) How is the product cost estimated? What is the necessity of product cost estimation? [8+8]
6. (a) Distinguish between the linear programming and dynamic programming as applicable to optimize raw material sourcing.
(b) Define patent. Explain the inter relation between patent and royalties. What is infringement? [8+8]
7. Explain the role of government regulations and restrictions pertaining to the technology sourcing and intellectual property right and protection. [16]
8. Write short notes on any four of the following:
 - (a) Siting of a plant
 - (b) Depreciation and taxes
 - (c) Rate of return and interest rate
 - (d) Insecurity of investment
 - (e) Flow sheets. [4×4]
