



1. Discuss the concept of validation of large-scale process in detail.
2. What are various fire hazards? Discuss various types of fire extinguishers, their contents and role in extinguishing different classes of fires.
3. Define Fermentation. List out the advantages and disadvantages of the process of fermentation. Explain production of Vitamin B₁₂.
4. Discuss in detail the process of nucleation and its importance in crystallization. What are the general methods available for the preparation of polymorphs?

SHORT ESSAY (Answer any Nine)

9 X 5 = 45 Marks

5. Discuss steam distillation and its importance.
6. Define Filtration. Write a note on centrifugal filtration.
7. Write about 'extraction with agitation' with a suitable example.
8. Discuss various factors involved in moving from bench to pilot plant to full production.
9. What are the various process equipment available for technical nitration?
10. What are effluents? How are they managed in pharmaceutical industry?
11. Write a note on catalytic halogenations.
12. Explain various hydrogen transfer reaction by citing various examples.
13. With suitable examples, discuss utility of non-metallic oxidizing agents.
14. Write a note on Synthetic strategy.

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