Draw neat labeled diagrams wherever necessary.

LONG ESSAY (Answer any Three) **3 X 10 = 30 Marks**

1. Write a brief note on solubility. Discuss in detail different techniques to improve the solubility of poorly soluble drugs.
2. Explain preformulation studies for the development of liquid dosage form.
3. Discuss the role of formation additives in development and processing of dosage form.
4. Outline the *In-Vitro* and *In-Vivo* correlation of dissolution studies and write about levels of correlations.

SHORT ESSAY (Answer any Nine) **9 X 5 = 45 Marks**

5. Write about optimization method using simplex design.
6. Explain co-solvency and complexation methods.
7. Discuss the methods to predict the flow properties of pharmaceutical powders.
8. Explain micellar solubilisation and hydrotrophy with suitable examples.
9. Explain *In-vitro* dissolution testing of controlled release products.
10. Write a note on data handling and correction factor.
11. Explain characterization of crystals using DSC and XRD studies.
12. Discuss the methods of drug-excipient compatibility studies.
13. Write a brief note on new additives used in Pharmaceutical Industry.
14. Write a note on solution stability.

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