

Syllabus for the post code TA 10, in the area of Pharmaceutics & Pharmacokinetics

| S. No. | Content |
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| 1. | Viscosity and Rheology Newtonian systems, law of flow, kinematics viscosity, effect of temperature, non-Newtonian systems, pseudoplastics, dilatant, plastic, thixotropy in formulations, determination of viscosity and thixotropy by capillary, falling ball, rotational viscometer, application of rheology in pharmacy |
| 2. | Dispersion systems a. Colloidal dispersions: Definition, types, properties of colloids, protective colloids, application of colloids in pharmaceutical industry and research. |
| 3. | Buffer Buffer equations and buffer capacity in general. Buffers in pharmaceutical systems, preparations and stability, buffered isotonic solutions. Measurements of tonicity calculations and methods of adjusting isotonicity. |
| 4. | Solubility Dielectric constant and solubility, solubility of solids in liquids, ideal and non-ideal solutions, solvation and association in solutions, solubility of salts in water, solubility of slightly soluble and weak electrolyte, calculating solubility of weak electrolytes as influenced by pH, influence of solvents on the solubility of drugs, combined effect of pH and solvents, distribution of solutes between immiscible solvents, effect of ionic dissociation and molecular association on partition, extraction, preservatives action of weak acids in emulsions, drug action and distribution coefficient. Techniques to improve the aqueous solubility of poorly water soluble molecules. |
| 5. | Pharmaceutical Impurities Impurities in pharmaceutical substances, sources, types and effects of impurities. Limit tests for heavy metals like lead, iron, arsenic, mercury & for chloride & sulphate as per Indian Pharmacopoeia. |
| 6. | Monographs Monograph & its importance, various tests included in monographs as per I. P. A study of the following compounds with respect to their methods of preparation, assay, & pharmaceutical uses of sodium citrate, calcium carbonate, copper sulphate, light and heavy kaolin, ammonium chloride & ferrous gluconate. |
| 7. | Introduction to dosage form Definition of the drug. New drug and dosage form. The desirable properties of a dosage form, the need of dosage form. Ideas about the available type of dosage forms and new drug delivery system. |
| 8. | Sources of drug information Introduction to Pharmacopoeia with reference to IP, BP, USP and International Pharmacopoeia. Study of structure/features (index) general notice and compartment of monographs of excipients, drug and drug product. Other sources. Textbooks, journals, internet (drug information system, online database, patient/ consumer information and non-print material. Classification of information, primary, secondary and tertiary. Nomenclature of the drug. |

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| 9. | Preformulation studies Consideration of Importance, physical properties, physical forms, particle size, crystal forms, solubility, wetting, flow cohesiveness, compressibility, organoleptic properties and its effect on final product consideration. |
| 10. | Dosage form necessities and additives |
| 11. | Allopathic dosage form a) Capsules b) Tablets c) Parenterals - product requiring sterile packaging d) Suspensions e) Emulsions |
| 12. | Stability of active pharmaceutical ingredients and formulated products |
| 13. | GMP and validation |
| 14. | Packaging materials |
| 15. | Acid-base titrations |
| 16. | Non-aqueous titrations |
| 17. | Oxidation-reduction titrations |
| 18. | Precipitation titrations |
| 19. | Complexometric titrations |
| 20. | Gravimetry |
| 21. | Extraction techniques |
| 22. | Potentiometry |
| 23. | Miscellaneous methods of analysis including following: Diazotization titrations, Kjeldahl nitrogen estimation, Karl Fisher titrations and Oxygen flask combustion method. |
| 24. | Calibration of instruments |
| 25. | General principles of spectroscopy |
| 26. | Ultraviolet-visible spectrometry |
| 27. | Spectrofluorimetry |
| 28. | Flame photometry & atomic absorption spectrometry |
| 29. | Infrared spectrometry |
| 30. | Proton nuclear magnetic resonance spectrometry |
| 31. | Mass spectrometry |
| 32. | Polarography |
| 33. | Nephelometry & turbidimetry |
| 34. | Principal and applications of chromatography including following: Thin layer chromatography, Paper chromatography, Column chromatography, Gas Chromatography-Mass spectroscopy, High performance thin layer chromatography, high pressure/performance liquid chromatography and Liquid Chromatography-Mass spectroscopy Statistical treatment to experimental data. Sampling techniques & applications in pharmaceutical industry. |