| St.James College of Pharmaceutical Sciences<br>St.James medical Academy<br>River Bank, Chalakudy | | | |
|---|---|---|---|
| Programme: | **B. Pharm** | Sem.: | IV |
| Name of Course: (*Subject*) | PHYSICAL PHARMACEUTICS II | Course Code: | BP403T |
| Teaching faculty of the course | RINKU JAYAPRAKASH | | |

## Summary of the Lecture Plan

| Topic | Lectures | Hours |
|---|---|---|
| **Drug Stability** | Reaction kinetics | 3 |
| | factors influencing the chemical degradation of pharmaceutical product | 3 |
| | Stabilization of medicinal agent | 2 |
| | Accelerated stability testing in expiration dating of pharmaceutical dosage forms | 2 |
| **Rheology** | Types of systems | 3 |
| | Thixotropy | 3 |
| | viscocity | 1 |
| | Determination of viscocity | 2 |
| | Deformation of solids | 1 |
| **Coarse dispersion:** | Suspension, | 3 |
| | Physical stability of emulsions | 2 |
| | Emulsions | 2 |
| | Theories of emulsification | 2 |
| | Rheological properties | 1 |
| **Surface and interfacial phenomenon** | surface & interfacial tensions, | 3 |
| | spreading coefficient | 2 |
| | adsorption at liquid interfaces | 2 |
| | surface active agents | 1 |
| **Colloidal dispersions** | Classification of dispersed systems | 3 |
| | Optical, kinetic & electrical properties | 2 |
| | Effect of electrolytes | 2 |

## Major issues or Core aspects to be addressed/ covered:

| **Drug Stability** |
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| Basic concepts regarding reaction kinetics |
| First, second & third order kinetics and determination of the order of reaction |
| Physical and chemical factors like temperature, solvent, ionic strength, dielectric constant, specific & general acid base catalysis affecting reactions |

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| Simple numerical problems of reaction kinetics |
| Stabilization of medicinal agents against common reactions like hydrolysis & oxidation |
| Accelerated stability testing methods & Photolytic degradation and its prevention |
| **Rheology** |
| Newtonian systems, law of flow, Non Newtonian systems &dilatant system |
| Thixotropy in formulations |
| Methods to determine viscosity, & about viscometers like capillary, falling Sphere,&rotational viscometers |
| Plastic and elastic deformation, Heckel equation, |
| Stress, Strain, Elastic Modulus |
| **Coarse dispersion** |
| Suspensions .advantage & disadvantages ,Interfacial properties of suspended particle |
| Settling in suspensions & formulation of suspension |
| Emulsion, advantages& disadvantages, identification tests& formulation |
| Micro emulsions &multiple emulsions& also about the preservation of emulsion |
| Different theories of emulsification |
| Rheological properties of emulsions |
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| **Surface and interfacial phenomenon.** |
| Liquid interface surface &interfacial tensions, methods to determine the surface &interfacial tensions |
| surface free energy definition &derivations |
| spreading coefficient , definition , derivations, & applications |
| adsorption at liquid interfaces & at solid interfaces, HLB scale, detergency and the concept of solubilization |
| **Colloidal dispersions** |
| Colloids, definition, properties and classification |
| Optical properties |
| Kinetic properties& electrical properties |
| Effect of electrolytes, coacervation, peptization & protective action |
| Topic Title |
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**Sample Questions**

| **Drug Stability** |
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| Derive the zero order reaction rate constant and its half life. |
| Derive the second order reaction rate constant and its half life. |
| What are the factors affecting degradation of pharmaceutical product? |
| Derive the first order reaction rate constant and its half life. |
| Note on accelerated stability studies |
| Describe about the stabilization of medicinal agents against hydrolysis & oxidation |
| **Rheology** |
| Explain about Newtonian &non newtonian systems |
| Note on dilatant systems |
| What are the different methods to determine viscocity |
| Note on thioxotropy |
| Note on plastic &elastic deformation |
| **Coarse dispersion** |
| Explain about the formulation of suspension |
| Note on settling in suspension |
| What are the different identification tests for emulsion |
| Note on formulation of emulsions |
| What are the different theories of emulsification |
| Note on preservation of emulsion |
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| **Surface and interfacial phenomenon.** |
| What are the different methods to determine surface &interfacial tension |
| Note on surface free energy |
| Note on spreading coefficient |
| Explain in detail about surface active agent &HLB scale |
| **Colloidal dispersions** |
| What are colloids ,classify it and compare the properties |
| Note on kinetic properties of colloid |
| Describe in detail about the electrical &optical properties of colloids |
| Note on peptization |
| Topic Title |
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