BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE, INDIA
PhD Entrance Test – 2026
SECTION-II: Pharmaceutics - 35 Marks

Section II	
1	**Physical Pharmaceutics covering the following aspects:** **Solids:** Handling of solids, pharmaceutical granulation, compression and compaction properties of binary mixtures, lubricant sensitivity, characterization of granules and compacts. **Dissolution:** Theory of dissolution, concept of drug release. Dissolution test apparatus: different designs, factors affecting dissolution rate. Dissolution of different dosage forms: solids, suspensions, topicals, suppositories and controlled release systems. **Pharmaceutical aspects of solubilization** : Solubilization of drugs by following approaches: use of surfactants for solubiliaztion; solid dispersions, cyclodextrin inclusion complexes, cosolvency etc.
2	**Pharmaceutical preformulations:** Drug Excipient interactions: different methods Drug Stabilityand Kinetics:General considerations & concepts, half-life determination, Influence of temperature, light, solvent, catalytic species and other factors, Accelerated stability study, expiration dating.
3	**Novel Drug Delivery Systems covering the following aspects:** Design, development, manufacture and evaluation of the following: **Oral Drug Delivery Systems**: Osmotic DDS, Ion exchange controlled DDS, Hydrodynamically balanced DDS **Mucosal DDS:** Physiological basis of mucosal delivery with reference to oral mucosal, nasal, vaginal and rectal routes. Bioadhesion and bioadhesive polymers, DDS for mucosal administration. In-vitro, ex-vivo and in-vivo evaluationtechniques **Transdermal DDS**: Percutaneous absorption and penetration enhancers, development of transdermal gels, patches with reference to components and evaluation. Iontophoretic and Sonophoretic DDS. **Microspheres:** Methods to obtain microcapsules/ microspheres, their evaluation and applications **Nanoparticulate and Colloidal systems:** Polymeric and lipid nanoparticles, liposomes, niosomes, and polymeric micelles.
4	**Biopharmaceutics and Pharmacokinetics covering the following aspects:** **Absorption, Distribution, Metabolism, Excretion** **Pharmacokinetics** : Pharmacokinetics models, Laplace transformations and concept of compartment modeling. One compartment model : intravenous injection, intravenous infusion, extravascular route **Bio-availability and Bioequivalence:** Study design, protocols and regulatoryrequirements and statistical consideration in data analysis.

References:

1. A.Martin, P.Bustamante and A.H.Chun; Physical Pharmacy;Waverly.
2. N.G.Stanley-Wood, Enlargement and compaction of particle solids; Butterworths.
3. D.M.Parikh, Handbook of Pharmaceutical Granulation Technology; Marcel Dekker.
4. H.G.Brittain; Physical Characterization of Pharmaceutical solids; Marcel Dekker.
5. Lieberman, Rieser and Banker; Pharmaceutical dosage forms; Disperse system; Marcel Dekker.
6. M.N. Rubinstein, Pharmaceutical Technology, Drug Stability, John Wiley and Sons.
7. Martin R hodes, Principles of Powder Technology, John Wiley and Sons.
8. James J. Wells, Pharmaceutical Preformulation, Ellis Horwood Ltd.
9. P. H. List and P. C. Schmidt; Pharmaceutical technology, C R Spress.
10. Robinson, Novel Drug Delivery System, Marcel Dekker.

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