

Gujarat Technological University

M. Pharm. Syllabus

Semester I

Paper Code - 910107

Subject:- Specialisation Paper - I

Pharmaceutical Analysis-I

Theory –

Four hours per week; 6 Credits

Course Content:

Hours

- 1) Application of instrumental methods in the development of medicines, concept of analytical method development. 05
- 2) Validation and calibration of various instruments used for drug analysis such as UV-Visible Spectrophotometer, IR Spectrophotometer, Spectrofluorimeter, HPLC, HPTLC and GC. 10
- 3) Ion Selective electrodes: Classification, instrumentation and applications in drug analysis. 02
- 4) Principles and procedures involved in quantitative determination of following groups (a) Hydroxyl, (b) Aldehyde, (c) Ketone, (d) Ester (e) Amine. 05
- 5) A detailed study of principle and procedures involved in various physicochemical methods of analysis including instrumental methods of analysis of Pharmaceutical dosage forms containing the following classes of drugs: 20
 - a. Sulphonamides.
 - b. Barbiturates - i.e., Barbituric acid derivatives and Xanthine derivatives.
 - c. Steroids such as Adrenocortical steroids, Progesterone, Androgens and Cholesterol.
 - d. Vitamins like Vitamin A, B₁, B₂, B₁₂, C & E.
 - e. Antibiotics like Chloramphenicol, Erythromycin, Penicillin & Streptomycin.
 - f. Alkaloids of Cinchona, Ergot, Opium & Rauwolfia.
 - g. Glycosides such as Digitoxin, Digoxin & Strophanthin.
- 6) Elemental analysis such as determination of sodium, potassium, calcium, phosphorous, sulphur, chlorine, bromine and iodine. 05
- 7) Principles and procedures involved in the use of the following reagents in Pharmaceutical analysis : 08
 - a. N₁-naphthyl ethylene diamine.
 - b. *p*-dimethylaminobenzaldehyde (PDAB).
 - c. 2,6-Dichloro quinone chlorimide.
 - d. 1,2-Naphtho quinone 4 - sulphonate.
 - e. 2,3,5-Triphenyl Tetrazolium Salt.
 - f. Ninhydrin.
 - g. Folin - Ciocalteau reagent.
 - h. *P*-dimethylaminocinnamaldehyde.
 - i. 3-methyl-2-benzothiazoline hydrazone (MBTH).
 - j. 2,4-dinitrophenylhydrazine.
- 8) Analysis of excipients in solid state - Particle size analysis, X-ray diffraction. 05

Pharmaceutical Analysis-I
PRACTICALS
4 Hours per week, 6 Credits

1. Calibration and validation of UV-Visible, IR, Fluorimeter, HPLC & HPTLC.
2. Assays of official compounds by fluorimetry :
 - a) Quinine b) Codeine c) Thiamine and d) Riboflavin.
3. Study of Quenching effect in fluorimetry : quenching of quinine by potassium Iodide.
4. Determination of 'Sodium' in Sodium chloride injection.
5. Colorimetric estimation of Sulphacetamide in 'eye drops' using NED.
6. Assay of Reserpine injection IP.
7. Quantitative Analysis of drugs in the following 'Multicomponent dosage form' -
Ibuprofen & Paracetamol Tablet, Paracetamol and Nimesulide Tablet, Ciprofloxacin and
Tinidazole Tablet.
8. Q
Quantitative Determination of functional groups like:
 - a) Hydroxyl group b) Carbonyl group c) Amine
9. Quantitative Colorimetric determination of suitable drugs using following reagents :
10. a) *P*-dimethylaminocinnamaldehyde b) MBTH c) F-C reagent
11. d) 2,6-dichloroquinonechlorimide e) Ninhydrin.
12. Assay of the following official formulations :
 - a) a) Frusemide Tablet b) Metformin Tablet c) Chloroquine Tablet
 - b) d) Chloramphenicol Capsule e) Digoxin Tablet.
13. HPLC & HPTLC analysis of drugs.

Reference Books:

1. Vogel's : Textbook of quantitative chemical analysis revised by G. H. Jeffery, J. Bassett, J. Mendham, R. C. Denney, 6th Edition, Pearson Education Publishers -New Delhi, 1989, India..
2. H. Beckett and Stenlake, Practical Pharmaceutical Chemistry, Vol. I and Vol. II, 4th Edition CBS Publishers, 1997, New Delhi.
3. K.A Connors : Text Book of Pharmaceutical Analysis, 3rd Edition, Wiley- Inter Science Publication, 1999, New York.
4. Indian Pharmacopoeia, Vol. I & II, 1996, The Controller of Publications, Government of India.
5. John H. Kennedy, Principles of Analytical Chemistry, 2nd Edition, Saunders College Publishing, 1990, New York.
6. Higuchi, Bechman and Hassan : Pharmaceutical Analysis, 2nd Edition, John Wiley and Sons, New York.
7. D. C. Garratt, The Quantitative Analysis of Drugs, CBS Publishers, 2001, New Delhi.
8. P. D. Sethi, Quantitative Analysis of Drugs in Pharmaceutical Formulation, 3rd Edition.
9. J. W. Munson, Pharmaceutical Analysis - Modern Methods, Part - A & B, 2001.