# UNIVERSITY OF KOTA

***SCHEME OF EXAMINATION***

***AND***

***COURSES OF STUDY***

**Department of Pure & Applied Chemistry**

**Faculty of Science**

**Master of Science (M. Sc.)**

**Pharmaceutical Chemistry**

Session – 2014-15

# UNIVERSITY OF KOTA

**MBS Marg, Near Kabir Circle, KOTA (Rajasthan)-324 005**

# INDIA

# UNIVERSITY OF KOTA, KOTA

## M.Sc- (Prev.) -Pharmaceutical Chemistry- 2015

**Paper Scheme**

**Paper I. Biostatistics and Computer**

**Paper II. Quantitative Analytical method**

**Paper III. Stereochemistry and Reaction Mechanism**

**Paper IV. Chemistry of Natural Products**

**Paper V Basic Pharmacology**

**Paper VI. Biochemistry**

**Paper VII.** Practicals

## M.Sc. (F) Pharmaceutical Chemistry - 2015

**Paper Scheme**

**Paper I . Modern Analytical chemistry**

**Paper II. Drug delivery system & Biopharmaceutics**

**Paper III. Chemotherapeutic agents**

**Paper IV. Pharmacodynamic agents**

**Paper V. Drug design**

**Paper VI. Practical**

**Paper VII. Project**

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## *Paper I (PC- 501) Modern Analytical Methods*

**Duration 3 hrs.** **Max. Marks 100**

**Unit I** : colorimetery :methods of color measurements or comparison, instrumentation, spectrofluorometry : instrumentation and application

Atomic absorption and flame emission spectroscopy : theory instrumentation, atomic absorption spectrophotometers, atomic flouresence, selected determination.

**Unit II** ; principal techniques, instumentatuion, and application, interpretation of uv spectrophotometry and IR spectrophotometry, optical rotation its significance, instrumentation, dispersion terminology, plain curve, rotatory dispersion and circular dichorism.

**Unit III** : mass spectroscopy

Principal, technique, instrumentation, fragmentation, pattern, structural elucidation of compounds. chromatography : principal of separation, application of the technique, adsorption partition, paper, tlc, hptlc hplc, glc, IEC and gel electrophoresis

**Unit IV** : PMR : principal, technique, instrumentation, nmr signals, chemical shifts , spin spin coupling , shielding deshielding effect, diamagnetic anisotropy, geminal coupling **AMX, ABX and ABC** systems, shifts reagents and interpretation of spectra**,** C13 nmr : interpretation of data

**Unit V** : application of spectroscopic techniques to structural elucidation, introduction to spectral interpretation exercises, microbiological assaya and their principal, assays of vitamins and antibiotics .

## Paper II. (PC- 502) Drug Delivery System & Biopharmaceutics

**Duration 3 hrs** **Max. Marks 100**

**Unit I** : types, advantages, disadvantages and formulation of oral dosage forms including :

a. liquid dosage form like solution, syrups, suspensions and emulsion .

b. tablet

c. capsules

**Unit II** : types, advantages, disadvantages and formulation of parentaral dosage forms and topical semisolids dosage forms. quality control of various dosage form.

**Unit III** controlled release drug delivery system, advantages, drug properties, relevant of controlled release formulation oral dosage form : diffusion system, dissolution system, osmotic pump ion exchange resin and prodrug parenteral dosage form : intramuscular injection and implants .

**Unit IV** : disintegration : time , factors affecting , dissolution : models, factor affecting, correlation with bioavailability, factor affecting drug absorption including physical, chemical, biological and pharmaceutical, passive diffusion and active diffusion .

**Unit V** : drug disposition : distribution in blood, plasma protein binding, cellular distribution, drug excretion, biotransformayion of drugs .

Bioavailibility : concept and comparison, method of estimation and bioequivalence studies .

## Paper III.(PC-503) Chemotherapeutic Agents

**Duration 3 hrs.** **Max Marks 100**

Synthesis of pharmacopoeial IP, BP, drugs with SAR studies and medicinal uses.

**Unit I** : Sulphonamides, penicillins, semisynthetic penicillin

**Unit II** : cephalosporin, tetracyclins and aminoglycosides antibiotics.

**Unit III** : antimicrobial agents, anti tb and antileprosy and antimalarials.

**Unit IV** : antiamoebic, and antiprotozoal, antihelminthes, antifungal .

**Unit V** : anticancer, antiviral.

## Paper IV. (PC-504) Pharmacodynamic Agents

**Duration 3 hrs.** **Max Marks 100**

Study of chemistry SAR and mechanism of following classes of drugs :
**Unit I** : drug acting on cvs : antihypertensive, antiarrhythmic , antianginal , antihyperlipidemic agents and diuretics .
**Unit II** : analgesics , narcotics and non-narcotics, antipyretics, anti-inflammatory , antigout drugs ,
**Unit III** : drug acting on cns : hypnotics and sedatives, general anesthetics , antiepileptics .
**Unit IV** : psychotropic agents : antidepressants, antiparkinsonia agents , hypoglycemic drugs , antithyroid .
**Unit V** : antihistamins : H1 and H2 antagonist, antiseretonins, carbohydrates based drugs , olinucleotides .

## Paper V (PC-505) Drug Design

**Duration 3 hrs.** **Max Marks 100**

**Unit I** : dose response curve , concept of agonist , partial agonist , antagonist , partial antagonist , competitive and non-competitive antagonist , drug metabolism
**Unit II** : specific and non specific drug action , concept of receptor , drug receptor interaction , receptor theories , receptor ion channels
**Unit III** : topographic receptor , adrenergic , cholinergic , H1 H2 steroidal serotonin , diazepene , opioid receptors .
**Unit IV** : drug metabolism approach to drug design , concept of isosterism and bioisosterism , metabolite antagonist , stereochemistry and drug action analog design , concept of prodrug .
**Unit V** : introduction to QSAR , chemical information computing system in drud discovery , molecular modeling drug action.

## Paper VI : Practicals (PC- 506)

1. to determine the acid value of mustard oil
2. to determine the saponification value of mustard oil
3. to determine iodine valve of mustard oil
4. assay of acetic acid
5. assay of borax
6. assay of paracetamol tablets
7. assay of aspirin tablets
8. assay of iodine
9. assay of dicyclophenax sodium tablets
10. assay of dicyclophenax sodium injection
11. assay of phenol
12. assay of sodium hydroxide
13. assay of ibuprofen tablets
14. assay of chlorempheniсol capsules
15. assay of diazepam tablets
16. determination absorption maxima and test the validity of lambart beer's law
17. assay of ascorbic acid
18. assay of ibuprofen and paracetamol in combination
19. assay of theophylline tablets (i.p.)
20. assay of theophylline tablets(b.p.)
21. assay of calcium gluconate injection
22. to evaluate ph of given paracetamol tablet