ACADEMIC YEAR 2012 – 2013 ONWARDS

EXTRA DISCIPLINARY PAPERS

SECOND SEMSTER

EXTRA DISCIPLINARY COURSE PAPERS

In for M.Sc., Chemistry, M.Sc., Organic Chemistry and M.Sc Analytical Chemistry

Department of Chemistry

List of Extra Disciplinary Course papers

1. **Industrial Chemistry**
2. **Agricultural Chemistry**
3. **Food and Medicinal Chemistry**
4. **Pharmaceutical Chemistry**

SECOND SEMESTER

EXTRA DISCIPLINARY COURSE PAPER-1

INDUSTRIAL CHEMISTRY (60 Hours)

UNIT-I Glass and Ceramics (12 Hours)

I.1 Glass: Introduction. Raw materials, manufacture and applications. Some special glasses-fused silica glass, optical glass, glass wool, photosensitive glass-composition and uses.

1.2 Ceramics: Definition. Manufacture and applications.

UNIT-II Cement (12 Hours)

Cement: Introduction, Types of cement- High alumina cement, Slag cement, Acid resisting cement, White cement, Types of Portland cement, Raw materials, Manufacture of cement, Setting of cement, factors affecting quality of cement, Cement industries in Tamilnadu.

UNIT-III Dyes and Paints (12 Hours)

3.1 Dyes: Classifications of dyes, application of dyes in other areas-medicine, chemical analysis, cosmetics, colouring agents, Food and beverages.

3.2 Paints: Constituents of paints, Manufacture of paints, Setting of paints, requirement of a good paint, paint failure.

UNIT-IV Synthetic fibres and Plastics (12 Hours)

4 .1 Synthetic fibres: Difference between natural and synthetic fibres, Applications of synthetic fibres-Rayon, Terylone, Nylon. Taflon.

4 .2 Plastics: Domestic and industrial applications of all types of plastics.

UNTI-V Oils, Fats and Waxes (12 Hours)

Classification of oils, fats and waxes, distinction between oils, fats and waxes, Uses of essential oils and fats. Soap and its manufacture toilet and transparent soaps cleansing action of soap Detergent – classification and uses.

Text Books

1. B.K. Shanna, **Industrial Chemistry,** Goel Publishing House Pvt Ltd. 1999.
2. M.G. Arora and M. Sin«h, **Industrial Chemistry.** Anmol Publications, 1st edition, 1994.

3. G.N.Pandey, **A Textbook of Chemical Technology.** Vol. I and II, Vikas Publishing House Pvt Ltd. 1997.

Reference Books

1. B.K. Chakrabarty, **Industrial Chemistry,** Oxford & IBM Publishing CO. Pvt Ltd. 1991.

2. V. Subrahmaniyan, S. Renganathan. K.Ganesan, S.Ganesh. **Applied Chemistry.** Scitcch Publications, 1998.

3. J.E.Kuria Cose and J.Rajaram, **Chemistry in Engineering & Technology**. Vol.1 & II, TataMc Craw Hill. 1984.

SECOND SEMESTER

EXTRA DISCIPLINARY COURSE PAPER- II

AGRICULTURAL CHEMISTRY (60 Hours)

UNIT-I Water source for Agriculture (12 hours)

Water treatment and water analysis-acidity, alkalinity, pH, Biological oxygen demand (BOD). Chemical oxygen demand (COD) and their determinations, Recycling of water, water management.

UNIT - II Chemistry of soil, soil classification and soil analysis (12 Hours)

Definition, classification and properties of soil, Soil erosion, Soil fertility, Soil organic matter and their influence on soil properties, Soil reactions- soil pH, acidity, alkalinity, buffering of soils and its effect on the availability of N, P, R. Ca and Mg.

UNIT-III Irrigation (12 Hours)

Crop Seasons-seed, seed development organization, natural seeds projects phase-III, new policy on seed development; Soil- soil reclamation, alkali soil, saline soils, methods for soil reclamation; Irrigation Environmental degradation and Irrigation projects.

UN1T-IV Fertilizers (12 Hours)

4.1 Fertilizers: Effect of Nitrogen, potassium and phosphorous on plant growth. Secondary nutrients – micronutrients- their functions in plants classification of fertilizers, natural fertilizers, artificial fertilizers, phosphate fertilizers; Manufacture of urea and triple super phosphate

4.2 Manures: Bulky organic manures- Farm yard manure- handling and storage, oil cakes. Blood meal, fish manures.

UNIT- V Pesticides and Insecticides (12 Hours)

5.1 Pesticides; Classification of Insecticides, fungicides herbicides as organic and inorganic, general methods of application and toxicity, safety measures when using pesticides.

Insecticides: Plant products-Nicotine, pyrethrin, Inorganic pesticides-borates, organic pesticides - D.D.T and BMC.

5.2 Fungicide and Herbicides:

Fungicide: Sulphur compounds, copper coumpounds, Bordeaux mixture,

Herbicides: Acaricides- Rodenticides, Attractants- Repellants, Preservation of seeds.

Text books

1. N.C. Brady, **The nature and properties of soils,** Eurasia publishing House, New Delhi. 1977.

2. V.S, Jones. **Fertilizers and soil fertility,** Prentice Hall of India, New Delhi, 1993.

3. D.E.H. Freer, **Chemistry of pesticides, D.** Van Nostrand Co, Reinhold, 1969.

4. A.K. De. **Environmental Chemistry,** Wiley Eastern. 1989.

Reference books

1. A. Sankara. **Soils Science.**

2. R.C. Palful. K. Goel. R.K. Gupta, **Insecticides, Pesticides and Agro based Industries.**

3. B.K. Sharma, **Industrial Chemistry.**

SECOND SEMESTER

EXTRA DISCIPLINARY COURSE PAPER- I I I

F O O D A N D MEDICINAL CHEMISTRY (60 Hours)

UNI I -I Food (12 I iuuis)

1.1 Food Adulteration

Sources of food, types, advantages and disadvantages, constituents of foods, carbohydrates, proteins, fats and oils, colours, flavours, natural toxicants.

1.2 Food poisoning

Sources, causes and remedy- Causes and remedies for acidity, gastritis, indigestion and constipation.

1.3 Food preservation

Food spoilage, causes of food spoilage, types o flood spoilage, food preservation.

UNIT-II Vitamins and minerals (12 Hours)

2.1 Vitamins: Sources, requirement, deficiency diseases of A. B. C. H and K.

2.2 Minerals: Mineral elements in food-principal mineral elements - Source- Function - Deficiency and daily requirements- Na, K. Mg. Fe, S. P and I.

UNIT-III (12 Hours)

3.1 Antibiotics: Definition, Classification as broad and narrow spectrum, mode of action and uses of penicillin, Chloramphenicol, tetracyclines, ciphalosporin, ampicillin and erythromycin.

3.2 Sulphonamides: Mechanism and action of sulpha drugs, preparation and uses of sulphadiazine, sulphathiazole, sulphapyridine and sulphafurazole.

3.3 Analgesics- definition- narcotic and non-narcotic- morphine and its derivatives- pethidine and methodone - pharmacological action- uses and abuses. Heroin and codinine. Antipyretic analgesics- Preparation and uses of aspirin and paraacetamol.

UNIT-IV f 12 Hours)

4.1 Antiseptics and disinfectants- definition and distinction- phenol coefficient, phenol as disinfectant, chlorhexidinc, formaldehyde and nitrofurazone- uses.

4.2 Anaesthetics- definition- classification- local and general- volatile, nitrous oxide, ether, chloroform, cyclopropane- uses and disadvantages- nonvolatile- intravenous- thiopental sodium, methohexitone, propanidide, local anaesthetics- cocaine and benzocaine- uses and disadvantages.

4.3

UNIT-V (12 Hours)

5.1 Drugs affecting CNS- Definition and one example for tranquilisers, sedatives, hypnotics, psychedelic drugs- chlorpromazine and barbitone- uses

5.2 Hypoglycemic agents- Diabetes- types- causes- symptoms- Insulin- uses. Oral hypoglycemic agents- sulphonyl ureas- action and uses.

5.3 Antineoplastic drugs- Causes for cancer, Antineoplastic agents, cytotoxic. anti-metabolites, plant products, harmones- one example and uses

5.4 AIDS-causes, prevention and control.

5.5 Indian medicinal plants and uses- tulasi, kilanelli, mango, semparuthi, adadodai and thoothuvalai.

Text Hooks

1. Seema Yadav. **Food Chemistry.** Anmol publishing (P) Ltd, New Delhi.
2. T.C. Daniels and E.C. Jorgensen. Text book of organic medicinal and pharmaceutical chemistry, J.B. Lippincott, Philadelphia. 1997.
3. Ashutosh Kar, **Medicinal Chemistry,** New Age International, 1996.
4. Bentley & Drivers. **Text Book of Pharmaceutical Chemistry.**

Reference books

1. S. Lakshmi. **Pharmaceutical Chemistry,** Sultan Chand & Sons, New Delhi.
2. Car H. Synder, **The Extraordinary Chemistry for ordinary things.** John Wiley & Sons inc.,, New York, 1992.
3. *A.* Singh and V.K. Kapoor, **Organic Pharmaceutical Chemistry.**
4. I.L. Firnar, **Organic Chemistry,**VoI-II.
5. SJ. Bown and C.W.J. Scaife, **Chemistry & Life Science Approach.**
6. Albert Lehninger. **Bio Chemistry.**
7. G.R. Chatwal, **Pharmaceutical Chemistry Organic.** Vol-II,
8. G.R. Chatwal, **Pharmaceutical Chemistry Inorganic,** Vol-I.

SECOND SEMESTER

EXTRA DISCIPLINARY COURSE PAPER- IV

PHARMACEUTICAL CHEMISTRY (60 Hours)

UNIT - I (l2Hours)

Inroduction: Importance of Chemistry in pharmacy. Important terminologies used, their meaning- molecular pharmacology, pharmacodynamics, phamacophore, metabolites, antimetabolites, bacteria, virus, fungi, actinomycetes.

Names of drugs: Code no. Chemical, proprietary, trivial, trade, non-proprietary names- meaning only. Assay- biological, chemical, immunorological - statement only. Mechanism, metabolism of drugs and their effect on pharmacological activity. Absorption of drugs.

Drug delivery systems, sustained release of drugs.

Physiological effects of different functional groups in drugs.

UNIT-II (12 Hours)

2.1 Indian Medicinal plants and trees- adathoda, tulsi, thoothuvalai, shoeflower, neem. mango, kizhanelli. Ocimum, grass and greens.

2.2 Antibiotics: Definition. Structure- uses of chlorarnphenicol- ampicillin. streptomycin, tetracyeline- ritaniycin, Macrolidcs- Erythromycin- properties and uses.

Structural features- SAR- functional group responsible for drug action. Structural modification that changes the potency of the above drugs. Conditions for their use as therapeutic agents. Fields of application.

2.3 Sulphonamides: Substituents in the amide group. General properties and drug action. Preparation and uses of sulphadiazine, sulphapyridine, sulphathiazole, sulphafurazole and prontosil.

UNIT-III (12 Hours)

3.1 Antineoplastic drugs: Causes for cancer, Antineoplastic agents, cytotoxic. antimetabolites, plant products, harmones.

3.2 Antipyretic, analgesics, anti-inflammatory agents: Classification. Action of analgesics. Narcotic analgesics- Morphine and its derivatives. SAR.

Synthetic analgesics- pethidine and methadones.

Salicylic acid and its derivaties, indolyl derivatives, aryl-acetic acid derivatives, pyrazole. p-aminophenol derivatives- mechanism of action.

3.3 Antiseptics and disinfectants: Definition. Standardizalion of disinfectants, Use of phenols, dyes, chloramines, chlorohexadiene, Organomercurials, Dequalinium chloride, formaldehyde. Cationic surface active reagents, chloraminet-nitrofurazone.

Distinction between antiseptics and disinfectants.

UNIT – IV **(**12 Hours**)**

4.1 Hypoglycemic drugs: Diabetes-types-causes. Contol symptoms. Control, Insulin-preparation, uses. Oral Hypoglycemic agents, Sulphonylureas.

4.2 Anaesthetics: Definition, Classification. Uses of volatile anaesthetics - nitrous oxide, ethers, cyclopropane, chloroform, halothane, trichloroethylene, ethyl chloride - storage, advantages and disadvantages, intravenous anaesthetics- thiopenta! sodium, methohexitone, propanidide.

Local anaesthetics: requisites. Uses of esters - cocaine, benzocaine, procaine, amethocaine. Proxymelacaine, Amides- Lignocnine, cinchocaine hydrochloride.

UNIT-V (12 Hours)

5.1 Haematological agents: Coagulants and anticoagulants; Coagulants: vitamin K, Protamine sulphate, dried thrombin, Proteins, amino acids, Anticoagulants - Coumarins, indanediols. citric acid, 2-sulphonyl acids, quinoxaline, throm lodyn, Haemostatics - amino caproic acid, transexamic acid, Anaemia: Causes, detection, antianaemic drugs.

5.2 Cardio Vascular drugs: Cardiac glycosides, antiarrhythmic drugs, antihypertension drugs, antianginal agents, vasodilators, lipid lowering agents. One example for each.

Text books

1. T.C. Daniels and E.C. Jorgensen. **Text book of organic medicinal and pharmaceutical chemistry**, J.B. Lippincott, Philadelphia, 1997.
2. Ashutosh Kar, **Medicinal Chemistry**, Ne\v Age International. 1996.
3. Bentley & Drivers, **Text Book of Pharmaceutical Chemistry**.

Reference books

1. S.Lakshmi, **Pharmaceutical Chemistry**. Sultan Chand & Sons, New Delhi.
2. A. Singh and V.K. Kapoor, **Organic Pharmaceutical Chemistry**.
3. l.L.Finar, **Organic Chemistry**. Vol-Il.
4. S.J. Bown and C.W.J. Scaife, **Chemistry & Life Science Approach**.

5. Albert Lehninger. **Bio Chemistry**.
6. G.R. Chatwal, **Pharniaeentical Chemistry Organic**. Vol-II.
7. G.R. Chatual, **Pharmaceutical Chemistry Inorganic**, Vol-I.

Model question paper
(For the candidates admitted from 2012-2013 onwards)
M.Sc/ M.A/ M.Com/ M.C.A Degree Examinations
Second Semester

EDC - PAPER-I INDUSTRIAL CHEMISTRY

Time: 3hrs **Maximum: 75 marks**

PART-A Answer all questions, either (a) or (b)

1, a) Write an account of optical glass and photosensitive glass

(Or)

b) Explain the raw materials used in the manufacture of glass

2. a) Explain the theory of setting of cement

(Or)

b) What is Portland cement? Give its rough composition

3. a) Mow are dyes classified?

(Or)

b) What are paints? Discuss the essential components of a good paint.

4. a) Distinguish between natural fibres and synthetic fibres?

(Or)

b) Write notes on Rayon and Nylon.

5. a) i) What are essential oils? Give an example.

ii) Give two examples for waxes.

(Or)

b) Explain the cleansing action of soaps.

PART-B **(10x5-50 Marks)**

Answer alt questions, either (a) or (b)

6. **a**) How is glass manufactured?

(Or)

b) Discuss the manufacture and uses of ceramics.

7. a) How is cement manufactured?

(Or)

b) i) What are the types of cement? (4)

ii) Write an account of the factors affecting the quality of cement (6)

8. a) Give an account of the application of dyes

(Or)

b) i) How is paint manufactured? (6)

ii) What arc the qualities of good paint? - (4)

9. a) Write notes on synthetic fibres

(Or)

b) Describe in detail the applications of plastics.

10. a) i) How are waxes classified? (3)

ii) Discuss the steps involved in the process of soap making (7)

(Or)

b) i) Distinguish between soups and detergents (6)

ii) Write briefly about the various types of soaps. *(4)*

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Model question paper
(For the candidates admitted from 2012-2013 onwards)
M.Sc./ M.A/ M.Com/ M.C.A Degree Examinations
Second Semester

EDC- PAPER-II AGRICULTURAL CHEMISTRY

Time: 3hrs **Maximum: 75 marks**

PART-A **(5x5=25 marks)**

Answer all questions, either (a) ur (b)

1) a) Define B.O.D. How is it determined?

(Or)

b) Describe method for the estimation of chemical oxygen demand in water sample.

2) a) Write the properties of coil.

(Or)

b) Write an account of soil erosion.

3) a) Write an account on new policy on seed development.

(Or)

b) Discuss about the seed development organization.

4) a) What are micronutrients? Give their Functions.

(Or)

b) Describe the uses of nitrogen and potassium on plant growth.

5) a) How are intesticides classified?

(Or)

b) Explain the general methods of applicat on of pesticides on crops.

PART-B **(10x5-50 Marks)**

Answer all questions, either (a) or (b)

6) a) Compare aerobic treatment process with anaerobic treatment process

(Or)

b) i) Write an account on recycling of water (5)

ii) Discuss about the water management (5)

7) a) Write a brief account on the characteristics of soil

(Or)

b) Write a note on soil analysis

8) a) Discuss about the methods for soil reclamation

(Or)

b) i) Write notes on environmental degradation (5)

ii) Discuss about the irrigation projects (5)

9) a) i) How are fertilizers classified based on the elements present in them? (7)

ii) How is urea commercially prepared? (3)

(Or)

b) i) What arc the different methods of handling manure? (7)

ii) Write notes on blood meal (3)

10) a) i) Write notes on pyrethrins (5)

ii) Define fungicide. Discuss how sulphur compounds acts as fungicides (5)

(Or)

b) i) What is Bordeaux mixture? Give its use (5)

ii) Discuss the safety measures while using pesticides, (5)

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Model question paper
(For the candidates admitted from 2012-2013 onwards)
M.Sc. / M.A/ M.Com/ M.C.A Degree Examinations
Second Semester

EDC - PAPER- III FOOD AND MEDICINAL CHEMISTRY

Time: 3hrs **Maximum: 75 marks**

PART-A **(5x5=25 marks)**

Answer all questions, either (a) or (b)

1) a) Write an account of Carbohydrates

(Or)

b) Mention the causes and remedy for acidity.

2) a) Mention the source and deficiency disease of vitamin A. Give the remedy.

(Or)

b) Write an account of mineral elements in food

3) a) i) What do you mean by antibiotics? (2)

ii) Give the uses of penicillin and chloramphenicol (3)

(Or)

b) Explain the preparation and uses of sulphapyridine .

4) a) Distinguish between antiseptics and disinfectants. Give two examples for each

(Or)

b) Write briefly about cocaine and ether

5) a) What are the causes of aids?

(Or)

b) Discuss the medicinal importance of Kilanelli

PAR'I-B **(10-0-50 Marks)**

Answer al! questions, either (a) or (b)

6) a) Write an account on i) gastritis and ii) indigestion.

(Or)

b) Write a brief account of food preservation and food spoilage.

7) a) Write briefly on vitamin E and vitamin K.

(Or)

b) i) What is the source, function and deficiency effect of iodine? (5)

ii) Write an account on vitamin B. . (5)

8) a) Explain the mechanism and mode of action of sulpha drugs.

(Or)

b) i) Write notes on non-narcotic analgesics. (5)

ii) What is ciphalosporin? Discuss its importance. (5)

9) a) What is local anaesthetic? What are the requirements of a good local anaesthetic?

(Or)

b) Write notes on: Anaesthetics, its classification and uses with examples.

10) a) Write notes on the following
i) Tranquilizecs (5)
ii) Uses of tulasi, thoothi valai and adadodai as medicine. (5)
(Or)
b) i) Explain hypnotics with examples (4)
ii) Explain the causes of cancer. What are the different types of drugs used for cancer treatment? (6)

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Model question paper
(For the candidates admitted from 2012-2013 onwards)
MSc. / M.A/ M.Com/ M.C.A Degree Examinations
Second Semester

EDC- PAPER-IV PHAPMACHUTICAL CHEMISTRY

Time: 3hrs **Maximum: 75 narks**

PART-A **(5x5=25 marks)**

Answer all questions, either (a) or i b)

1) a) i) What is pharmacodynamics? (2)
ii) What do you mean by proprietary and non-proprietary names of drugs? (3)
(Or)
b) What do you mean by bacteria, virus and fungi?

2) a) How are the following compounds prepared?
i} Sulphadiazine ii) sulphapyridine
(Or)
b) Discuss the medicinal importance of Kilanelli

3) a) Distinguish between disinfectant and antiseptic
(Or)
b) Discuss the use of dyes as antiseptics and disinfectants.

4) a) Explain hypoglycemic drugs with examples.
(Or)
b) Write a note on anaesthetic ether and cocaine.

5) a) What are Cardio Vascular drugs? Give an example and their mode of action
(Or)
b) Write a short account of anticoagulants. What is the need for it?

PART-B **(10x5-50 Marks)**

Answer all questions, either (a) or (b)

6) a) Write an account of the metabolism of drugs and their effect on pharmacological activity

(Or)

b) Discuss briefly about the physiological effects of different functional groups in drugs.

7) a) Discuss the importance of antibiotics taking atleast two examples.

(Or)

b) i) Explain how the potency of a drug can be enhanced or retarded by structural modification. (6)

ii) Write a note on the use of tulasi and thoothuvalai as medicine. (4)

8) a) Explain the causes of cancer. What are the different types of drugs used for cancer treatment?

(Or)

b) i) Write an account of salicylic acid derivatives. (6)

ii) How it is used as an analgesics? (4)

9) a) Write notes on: Anaesthetics, its classification and uses with examples.

(Or)

b) i) How is diabetes caused? How is it treated? (5)

ii) Give the preparation and uses of insulin. (5)

10) a) i) Write notes on anti anaemic drugs. (5)

ii) Give the causes and control of anaemia. (5)

(Or)

b) i) Write a note on coagulation and the need for anticoagulant drugs. (6)

ii) Write a brief note on coumarin derivaties as anti-coagulants. (4)

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