Total No. of Questions : 6]

SEAT No. : [ ]

[Total No. of Pages : 2

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[4356] - 102

M.Pharmacy (Semester - I)

RESEARCH METHODOLOGY

(2008 Pattern)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Solve any two questions each from Section I and Section II.***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) Describe various avenues of collecting information and literature for research project. **[10]**

b) Explain statistical evaluation of data using t test & standard deviation. **[10]**

Q2) a) Differentiate between basic research and patent oriented research. **[5]**

b) Describe preparation of research proposal. **[15]**

Q3) Write notes (any two) **[20]**

a) Computer packages for documentation.

b) Use of statistics in research.

c) Sources of problems.

SECTION - II

Q4) a) Give an account of various sources for research grant in India. **[10]**

b) Describe various avenues of industry institute interaction. **[10]**

P.T.O.

Q5) a) Explain the preparation of patent proposal for filing in India. **[10]**

b) Describe skills required for effective presentation. **[10]**

Q6) Write notes (any two) **[20]**

a) Intellectual property rights in India.

b) Industrial projects.

c) Cost analysis of research project.

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Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages : 2

P781

[4356] - 104

M.Pharmacy

(Spl. Pharmaceutical Chemistry)

ADVANCED PHARMACEUTICAL CHEMISTRY

(2008 Pattern) (Semester - I)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***Answer two questions from section I and two questions from section II.***

2) ***Answers to the two sections should be written in separate books.***

SECTION - I

Q1) a) Explain with examples the various disconnection rules used in Synthon approach. **[10]**

b) Give the mechanism, stereochemistry and applications of Birch reduction and sharpless Oxidation. **[10]**

Q2) a) What is racemic mixture? Explain the methods of resolution of racemic mixtures. **[10]**

b) Explain the terms stereoselectivity and stereospecificity with examples. **[10]**

Q3) a) Give the asymmetric pathways for synthesis of propranolol and ampicillin. **[10]**

b) Write short notes on. **[10]**

i) Chiral axis and

ii) Heck reaction.

P.T.O.

SECTION - II

Q4) a) What are reduction reactions? Explain reduction with metallic hydrides. **[10]**

b) Give a Synthon approach route for synthesis of Ibuprofen and Diclofenac. **[10]**

Q5) a) What is solid phase synthesis? Explain the mechanism of protection, deprotection and coupling reaction in solid phase chemistry. **[10]**

b) What do you understand by the term asymmetric synthesis? Explain. **[10]**

Q6) a) Explain Allylic bromination. **[10]**

b) Write a short note on. **[10]**

i) Advantages of green chemistry and

ii) Grignard reaction.

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

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[4356] - 106

M.Pharmacy

(Spl. Pharmacognosy)

ADVANCED PHARMACOGNOSY-I

(2008 Pattern) (Sem. - I)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question Nos. 1 and 5 are compulsory. Answer any two questions from the remaining.***
2) ***Answer to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) What are the characteristics of natural products that make them an appropriate material in discovering new drugs? Explain with suitable examples. **[10]**

Q2) a) What is chemotaxonomy? What are its advantages and limitations of chemotaxonomy over other methods of classification? Write its application. **[7]**

b) Describes the flavonoids or terpenes as chemotaxonomic markers with suitable examples. **[8]**

Q3) What are biotechnological means used to enhance secondary metabolite production through tissue culture techniques. Describe biotransformation using plant cell culture. **[15]**

P.T.O.

Q4) Write note on the following (Any Three): **[15]**

a) Anthraquinone as dying agents.

b) Precursor feeding technique of secondary metabolite production.

c) Biodiesel.

d) Flavouring agents derived from plants.

SECTION - II

Q5) Enlist techniques used in the study of plant biosynthesis. Describe precursor product sequence method. **[10]**

Q6) a) Role of High Throughput Screening(HTS) in drug discovery. **[7]**

b) Review the plants having antidiabetic activity. **[8]**

Q7) Write various in vitro and in vivo models used in the evaluation of immunomodulatory activity. Explain *Withania somnifera* as an immunomodulator. **[15]**

Q8) Write note on the following (any Three): **[15]**

a) Flavonoids as anti-inflammatory agents.

b) Elicitators for enhancing secondary metabolite production.

c) Biopolymers.

d) Paclitaxel as anticancer agent.

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Total No. of Questions : 6]

SEAT No. : [ ]

[Total No. of Pages : 2

P784

[4356] - 107

M.Pharmacy (Semester - I)

(Spl. Quality Assurance Techniques)

ADVANCED QUALITY ASSURANCE TECHNIQUES-I

(2008 Pattern)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question No. 1 and Q.No. 4 are compulsory.Out of remaining solve any one from section - I and any one from section - II.***

2) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Define QA, Write importance of Documentation. Elaborates master production and control records. **[20]**

Q2) a) What are GMP issues for equipments. **[10]**

b) What is change control? Explain and design documents for change control. **[10]**

Q3) Write short note **[20]**

a) GMP to avoid mix up and cross contamination.

b) Quality management system.

P.T.O.

SECTION - II

Q4) Elaborate quality audit. **[20]**

Q5) a) Explain outsourcing with respect to pharma industry. **[10]**

b) Elaborate site and plant security and safety. **[10]**

Q6) Write short note **[20]**

a) Handling of recall, returned products.

b) MPCR and BPCR.

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Total No. of Questions : 8]

SEAT No. : ____

[Total No. of Pages : 2

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[4356] - 108

M.Pharmacy

QUALITY CONTROL & ASSURANCE OF PHARMACEUTICALS

(Elective) (2008 Pattern) (Sem. - I & II)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Q. No. 1 and 5 are compulsory.***
2) ***Solve any TWO from the remaining questions for each section.***
3) ***Answers to the two sections should be written in separate books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain in details about sources and controlling of Mix-ups and Cross contamination in pharmaceutical manufacturing. **[10]**

Q2) a) Write in details about important points to be covered in preparing SOP on receipt, storage and sampling of Raw materials. **[8]**

b) Write in brief about principal areas of Pharmaceutical manufacturing facilities. **[7]**

Q3) a) Define key personnel and explain responsibilities and job description of Head of Production. **[8]**

b) What is PPMP? Give the SOP for PPMP. **[7]**

Q4) Write short note on: **[15]**

a) Quality Culture.

b) SOP on handling of rejected material.

c) Good Manufacturing Practises.

P.T.O.

SECTION - II

Q5) Define cleaning validation, explain factors in cleaning validation. **[10]**

Q6) a) Write in detail about contents of B.P.C.R. **[8]**

b) Enlist components of HVAC and write in brief about construction of HEPA filters. **[7]**

Q7) a) Write a note of validation Master Plan. **[8]**

b) What is compliance audit? How it is different from normal audit. **[7]**

Q8) Write short note on: **[15]**

a) Significance of SOP's and Records.

b) Media Fill Test.

c) International biological Standards.

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Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages : 2

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[4356] - 110

M.Pharmacy

BIOPHARMACEUTICS & PHARMACOKINETICS

(Elective) (2008 Pattern) (Sem. - I & II)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Answer any two questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***All questions carry equal marks.***

SECTION - I

Q1) Explain significance of dissolution as a biopharmaceutical parameter. Discuss various empirical kinetic models derived from Noyes-Whitney equation.

Q2) Describe Wagner-Nelson method. Write detailed note on compartment modeling.

Q3) Write notes on any two -

a) Multidrug resistance transporters.

b) Regulatory aspects of BA/BE studies of controlled drug delivery systems.

c) Implications of drug protein binding in Pharmacokinetics.

P.T.O.

SECTION - II

Q4) What is nonlinearity in kinetics? How is it detected? Describe the methods for determination of Vmax and Km.

Q5) What is individualization? Describe dosage adjustment in renal and hepatic failure.

Q6) Write notes on any two -

a) Kinetics of protein binding.

b) Multicompartment model.

c) Clearance as a pharmacokinetic parameter.

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

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[4356] - 111

M.Pharmacy (Semester - I & II)

STERILE PRODUCTS FORMULATION AND TECHNOLOGY

(Elective) (2008 Pattern)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question nos. 1 and 5 are compulsory. out of the remaining attempt two questions from section I and two questions from section II.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Discuss physicochemical properties of drug, vehicle and excipients as preformulation parameters for small volume parenterals. **[12]**

Q2) a) Give the detail account on evaluation of Liposome parenteral formulations. **[7]**

b) Discuss the pyrogrn testing of parenterals. **[7]**

Q3) Discuss applications of novel ocular drug delivery systems and formulation and evaluation of them. **[14]**

Q4) Write short note on (ANY TWO) **[14]**

a) Lyophilization technique in formulation of parenterals.

b) Nanoparticals as injectable drug formulation.

c) Therapeutic and biopharmaceutical applications of Parenteral emulsions.

P.T.O.

SECTION - II

Q5) Describe layout of parenteral facilities and explain various zones in manufacturing and filing areas. **[12]**

Q6) Describe selection of sterilization process and specifications for parenterals. **[14]**

Q7) Describe HEPA filters with its validation in detail. **[14]**

Q8) Write short note on (ANY TWO) **[14]**

a) Parenteral devices.

b) Regulatory guidelines in parenterals.

c) Testing of environmental facility for sterile manufacturing.

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

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[4356] - 112

M.Pharmacy

CHEMISTRY OF MEDICINAL NATURAL PRODUCTS

(Elective) (2008 Pattern) (Semester - I & II)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question No. 1 and 5 are compulsory. Out of the remaining solve any two questions from section I and any two questions from section II.***
2) ***Answers to the two sections should be written in separate answer books.***

SECTION - I

Q1) Write down the chemistry and structural elucidation of Atropine. **[10]**

Q2) Describe various techniques for isolation and purification of Alkaloids and Glycosides. **[15]**

Q3) Explain Shikkimik acid pathway and biogenetic pathway for Ornithine derived alkaloids. **[15]**

Q4) Write Note on (Any Two) **[15]**

a) Analytical methods for evaluation of Ephidrine.

b) Chemistry and properties of alkaloids.

c) Isolation and purification of Carbohydrates.

P.T.O.

SECTION II

Q5) Describe in detail Chemistry, properties and role of flavoinoids. **[10]**

Q6) Describe structure of Diosgenin with its methods of analysis. **[15]**

Q7) Write chemistry and properties of Steroids. Describe the general biogenetic pathway for formation of steroids. **[15]**

Q8) Write Note on (Any Two) **[15]**

a) Solasodine.

b) Disaccharides.

c) Plant pigments.

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Total No. of Questions : 8]

SEAT No. : [ ]

[Total No. of Pages : 2

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[4356] - 113

M.Pharmacy

ACTIVE PHARMACEUTICAL INGRADIENTS (APIS)

Manufacturing Technology

(Elective) (2008 Pattern) (Sem. - I & II)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question nos. 1 and 5 are compulsory. Out of remaining attempt two questions from section I and two questions from section II.***
2) ***Figures to the right indicate full marks.***

SECTION - I

Q1) What is Industrial stoichiometry? Explain with suitable example material balance calculations. **[10]**

Q2) Give process flow diagram of Aspirine manufacturing process. **[15]**

Q3) Comment on unit process of nitration using suitable example. **[15]**

Q4) Write short notes on (any two) : **[15]**

a) Hazards in nitration process.

b) Unit process of halogenation.

P.T.O.

SECTION - II

Q5) What is evaporation unit operation? With a suitable diagram explain operation of triple effect evaporators. **[10]**

Q6) Comment on design of photocatalysed halogenations reactors. **[15]**

Q7) Give process flow chart and explain flow of raw materials in the manufacturing of (any one). **[15]**

a) Benzocain

b) Sulphamethoxazole

Q8) Comment on catalytic hydrogenation. Give advantages of catalytic process over chemical reductions. **[15]**

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 1

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[4356] - 115

M.Pharmacy

SAFETY PHARMACOLOGY

(Elective) (2008 Pattern) (Theory) (Sem. - I & II)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question Number 1 & 5 are compulsory. Out of remaining attempt any two questions from section-I and two questions from section-II.***
2) ***Separate answer book should be used for separate sections.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain in detail the various applications of *in vitro* techniques in drug safety assessment. **[10]**

Q2) Discuss in detail the in vitro and in vivo studies for genotoxicity. **[15]**

Q3) Explain various studies for ocular toxicity testing. **[15]**

Q4) Write notes on : **[15]**

a) Repeated dose studies.
b) Carcinogenicity testing.

SECTION - II

Q5) Explain the regulatory requirements of ICH for the new drug safety assessment. **[10]**

Q6) Discuss the study design and importance of reproductive toxicity testing. **[15]**

Q7) Discuss Adverse Event (AE) reporting in clinical trials. **[15]**

Q8) Write notes on : **[15]**

a) Statistics in Pharmaceutical Safety Assessment.
b) Risk and benefit assessment.

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 1

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[4356] - 117

M.Pharmacy

NATURAL PRODUCTS MANAGEMENT

(2008 Pattern) (Semester - I & II) (Elective)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question No. 1 & 5 are compulsory Out of the remaining solve any two questions from section I and any two questions from section II.***
2) ***Answers to the two sections should be written in separate answer books.***

SECTION - I

Q1) Explain in detail about methods for cultivation and quality control of medicinal plants. **[10]**

Q2) Enlist various institutions and organizations involved in development of medicinal plants. Add about various programs run by them for development of medicinal plant products. **[15]**

Q3) What is the role of collectors and growers for effective processing of Natural products? Explain. **[15]**

Q4) Write an elaborative note on planning and budgeting of Medicinal plant farming. **[15]**

SECTION - II

Q5) Describe the regulatory aspects and marketing methods for Herbal cosmetics. **[10]**

Q6) Explain the IPR of herbal products in India. **[15]**

Q7) What are the basic necessities of herbal extraction unit? Write their importance. **[15]**

Q8) Discuss the trading of Natural medicinal products in international market. **[15]**

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Total No. of Questions : 12]

SEAT No. : [ ]

[Total No. of Pages : 2

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[4356] - 118

M.Pharmacy (Semester - I & II)

MEDICINAL PLANT BIOTECHNOLOGY

(2008 Pattern) (Elective)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***This question paper consists Section I and Section II.***
2) ***Use two separate answer books for the Section I & Section II.***
3) ***Section I carries 6 questions of 10 marks each. Answer any four questions in Section I.***
4) ***Section II carries 6 questions of 10 marks each. Answer any four questions in Section II.***
5) ***Figures to the right indicate full marks.***
6) ***Enter the question number clearly in the margin of the anwer book beside each of your answer.***

SECTION - I

Q1) Explain in detail eukaryotic cell cycle. What is the role of cyclins and cyclin-dependent kinases (CDKs) in regulation of eukaryotic cell cycle? What are different Cell cycle checkpoints in eukaryotic cell cycle? **[10]**

Q2) What are different Methods of improving quality of crops? Write a brief note on Induced mutation technology for crop improvement. **[10]**

OR

Write a brief note on : Micro-propagation : A Revolution in Agriculture of medicinal plants.

Q3) What is Biotransformation? Write a brief note on Biotransformation of exogenous substrates by plant cultured cells. **[10]**

Q4) Write a brief note on Haploid Plant Production Methods. **[10]**

Q5) What is In vitro plant germplasm conservation? Write a detail note on the methods involved in the in vitro conservation of germplasm. What are several limitations of the germplasm conservation through the conventional methods? **[10]**

P.T.O.

Q6) Write short note on any two : **[10]**

a) Multiple Shoot Culture.

b) Modern plant breeding & techniques of molecular biology.

c) Enhancement of growth and secondary metabolite biosynthesis: Effect of elicitors.

d) Synthetic seed & Somaclonal variation.

SECTION - II

Q7) What are different Gene transfer methods in plants? What is Vectormediated or indirect gene transfer? What is Vectorless or direct gene transfer? What is Liposome mediated gene transfer or Lipofection? **[10]**

Q8) Write a detail note on structure, function, production & uses of papaya proteinase I enzyme. **[10]**

Q9) What are Transgenic Plants? **[10]**

Enlist Transgenic crops currently on the market.

Enlist Discontinued transgenic products.

Explain Herbicide tolerance in transgenic plants.

Write a brief note on Future transgenic products.

Q10) Write a detail note on Nucleic Acid Hybridization & Expression Analysis. **[10]**

Q11) What are Enzyme reactors? Classify enzyme reactors. Draw a neat labeled diagram of batch membrane reactor (MR). Explain its working. **[10]**

Q12) Write short note on any two : **[10]**

a) Edible Vaccines

b) Uses of PCR in gene mapping

c) Molecular markers in plant genome analysis

d) Bromelain

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

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[4356] - 201

M.Pharmacy

DRUG REGULATORY AFFAIRS

(2008 Pattern) (Sem. - II)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Q. No. 1 & 5 are compulsory, out of remaining attempt two questions from section - I and two questions from section - II.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Write the provisions of the act related to the import of the drug. **[10]**

Q2) Elaborate the 'Intellectual Property Rights' and 'Indian Patent Act 1970'. **[15]**

Q3) a) Write the salient features of the act related to the operation of Opium. **[8]**

b) Write the functions of Central Drugs Laboratory. **[7]**

Q4) Write short notes on following (any three) **[15]**

a) Copyright (Indian) Act

b) Drugs and Magic Remedies Act 1954

c) WHO

d) Drug Price Control Order 1995

P.T.O.

SECTION - II

Q5) Explain the cGMP requirements related to premises for pharmaceutical products. **[10]**

Q6) Write the constitution and composition of the Central and State Pharmacy Councils, also state the registration procedure of pharmacist. **[15]**

Q7) a) Explain the provisions related to pollution and Environment Control Act. **[8]**

b) Explain different sections of NDA. **[7]**

Q8) Write short notes on following (any three) : **[15]**

a) British Pharmacopeia.

b) Consumer Protection Act.

c) Good laboratory practices.

d) Material Safety Data Sheet.

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

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[4356] - 202

M.Pharmacy (Semester - II)

(Spl. Pharmaceutices)

FORMULATIONS AND DEVELOPMENT

(2008 Pattern)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question No. 1 & 5 are compulsory. Out of the remaining attempt two questions from Section - I and two questions from Section - II.***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain in detail formulation and development of buccal formulations. **[12]**

Q2) Discuss in detail self emulsified drug delivery systems. **[14]**

Q3) What are the characteristics of ideal package? Discuss the regulatory perspective of selection of pharmaceutical packaging material for various formulations. **[14]**

Q4) Write notes on ANY TWO : **[14]**

a) Pulsatile drug delivery system.

b) Multiple emulsion

c) Excipients in Colon specific drug delivery systems

P.T.O.

SECTION - II

Q5) Discuss in detail propellants in aerosol. Add note on manufacturing of Aerosol. **[12]**

Q6) Explain formulation strategy of veterinary dosage forms administered via drinking water. Add note on Specialized dose dispensers. **[14]**

Q7) Explain generation and significance of Nanopharmaceuticals. **[14]**

Q8) Write notes on ANY TWO : **[14]**

a) Quality control and regulatory aspects of veterinary dosage forms.

b) Semisolid based on Niosomes.

c) Advances in aerosol inhalation system

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Total No. of Questions : 6]

SEAT No. : [ ]

[Total No. of Pages : 2

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[4356] - 203

M.Pharmacy (Semester - II)

(Spl. Pharmaceutices)

NOVEL DRUG DELIVERY SYSTEMS

(2008 Pattern)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Attempt any two questions each from the section I and section II.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two sections should be written in separate answer books.***

SECTION - I

Q1) Discuss in detail various methods to achieve drug targeting to colon. **[20]**

Q2) a) Describe factors affecting design of sustained release drug delivery system. **[10]**

b) Give detailed account of implantable drug delivery. **[10]**

Q3) Write notes (any 2) : **[20]**

a) Intrauterine devices.

b) Formulation considerations of nasal drug delivery system.

c) Magnetic microspheres.

P.T.O.

SECTION - II

Q4) Describe approaches to targeted drug delivery to brain. **[20]**

Q5) Explain active & passive drug targeting & elaborate on role of liposomes as targeted drug delivery. **[20]**

Q6) Write notes (any two) : **[20]**

a) Monoclonal antibodies.

b) Stabilization of peptide drug delivery.

c) Occular inserts.

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Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages : 2

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[4356] - 205

M.Pharmacy (Semester - II)

(Pharmaceutical Chemistry)

DRUG DESIGN

(2008 Pattern) (M - II - 4)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Answer any two questions from section -I and any two questions from section-II.***
2) ***All questions carry equal marks.***

SECTION - I

Q1) a) Enumerate the different physicochemical properties of a drug molecule that influence the biological activity and describe in detail about Redox potential and pka Influences on biological activity. **[15]**

b) Write in brief about Bioprecursor prodrugs. **[5]**

Q2) a) What are Prodrugs? Discuss designing of drug molecule based on metabolism studies with suitable examples. **[15]**

b) Write in short about CoMFA. **[5]**

Q3) Write a note on (ANY TWO) : **[20]**

a) Steric features of drugs and its effects on the biological activity.

b) Indirect Drug design.

c) Craig plot and Cluster analysis.

P.T.O.

SECTION - II

Q4) a) What is Bioisoterism? Give classification of bioisosters. Write applications of Bioisoterism in designing of new drug molecule. **[15]**

b) Drug design based on antagonism. **[5]**

Q5) What is QSAR? Give advantages and disadvantages of QSAR. Explain Hantzsch analysis and Free Wilson analysis. **[20]**

Q6) Write a note on ANY TWO : **[20]**

a) Computer Aided Drug Design.

b) 3D QSAR.

c) Drug design based on Enzyme inhibition.

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Total No. of Questions : 6]

SEAT No. : [ ]

[Total No. of Pages : 2

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[4356] - 207

M.Pharmacy (Semester - II)

(Spl. Pharmacology)

MOLECULAR PHARMACOLOGY

(2008 Pattern) (M - III - 4)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Answer any two questions from each section .***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) a) Enlist various endogenous bioactive molecules. Add a note on pharmacology of atrial peptides. **[10]**

b) Discuss recent trends on drugs acting on adrenoreceptors. **[10]**

Q2) a) Describe role of sodium and chloride channels modulators in molecular pharmacology. **[10]**

b) Explain basic concepts of high through put screening. **[10]**

Q3) a) Application of transgenic mouse. **[5]**

b) Drugs acting on opoid receptors. **[5]**

c) Neuropeptides. **[5]**

d) Therapeutic implications of antioxidants. **[5]**

P.T.O.

SECTION - II

Q4) a) Enlist various classes of receptors. Discuss drugs acting on angiotensin receptors. **[10]**

b) Describe pharmacological and clinical implications of apoptosis. **[10]**

Q5) Discuss role of gene therapy in the treatment of various hereditary diseases with suitable examples. **[20]**

Q6) a) Cellular cytotoxicity. **[5]**

b) COX-2 regulator and inflammation. **[5]**

c) Cyclic nucleotides. **[5]**

d) Human genome mapping in drug research. **[5]**

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

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[4356] - 208

M.Pharmacy

(Spl. Pharmacognosy)

PHYTOCHEMISTRY & PHYTOPHARMACEUTICALS

(2008 Pattern) (Semester - II)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question Nos. 1 and 5 are compulsory. Out of the remaining attempt two questions from section I and two questions from section II.***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Write role of glycosides in herbal drug research. Write utilization of chromatographic & spectroscopic can be utilized in evaluation of herbal drugs. write with two suitable examples **[10]**

Q2) a) Write method of extraction, isolation & characterization & instrumental elucidation of sennosoids or morphine. **[7.5]**

b) Write chemical & pharmacological profile of any one of following: **[7.5]**

i) Ergometrine

ii) Digoxine

Q3) Explain standardization. Write its importance in Herbal drug industry with reference to following pharmaceuticals: **[15]**

a) Andrographolides.

b) Curcumin

P.T.O.

Q4) Write note on following (any two) **[15]**

a) Chemical profile of saponin glucosides.

b) Taxol on anticancer drug.

c) Importance of gingerol in pharma industry.

SECTION - II

Q5) Enlist various guide lines of WHO for evaluation of Herbal drugs. Write principle & procedure of following: **[10]**

a) Determination of Haemolytic index.

b) Tannin content.

Q6) a) Explain processes & equipments in production of herbal manufacturing. **[7.5]**

b) Write a note on analytical profile of herbal extracts **[7.5]**

Q7) Describe in detail Invivo & Invitro screening methods for evaluation of **[15]**

a) Anti - inflammatory activity.

b) Anti - oxidant activity.

Q8) Write note on following (any two) **[15]**

a) Infrastructure requirement of herbal extraction unit.

b) Parameters involved in evaluation of Antidiabetic activity.

c) Determination of Microbial count.

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Total No. of Questions : 8]

SEAT No. : [ ]

[Total No. of Pages : 2

P804

[4356] - 209

M.Pharmacy

(Spl. Pharmacognosy)

INDUSTRIAL PHARMACOGNOSY

(2008 Pattern) (Semester - II) (M - IV - 4)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question No. 1 and 5 are compulsory. Out of remaining attempt any two questions from section I and any two questions from section II.***
2) ***Answers to the two sections should be written in separate answer books.***

SECTION - I

Q1) Explain the scope for international trade in medicinal plants and derived products. **[10]**

Q2) Elaborate in brief the production and export of spices in indian trade of medicinal and aromatic plants. **[15]**

Q3) Comment on "Role of medicinal plants in National economy". **[15]**

Q4) Describe production and utilization of medicinal plants in India. **[15]**

SECTION - II

Q5) Give in short the classification of medicinal plant based industry for medicinal and aromatic plants. **[10]**

P.T.O.

Q6) What are different types of extracts used in Herbal formulations? Give in detail methods involved in standardization of extracts. **[15]**

Q7) Elaborate in detail process and equipments involved in extraction of Herbal drugs. **[15]**

Q8) Discuss in brief Global regulatory requirements of Herbal medicines. **[15]**

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Total No. of Questions : 6]

SEAT No. : ____

[Total No. of Pages : 2

P805

[4356] - 210

M.Pharmacy (Semester - II)

(Spl. Quality Assurance Techniques)

PHARMACEUTICAL VALIDATION

(2008 Pattern)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question Nos. 1 and 4 are compulsory. Out of the remaining solve any one question from section I and any one question from section II.***
2) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) Define validation, write its importance and types. **[10]**

b) Explain equipment validation of FBD. **[10]**

Q2) a) Write short note on validation master plan. **[10]**

b) Write difference between validation and qualification. What is URS, IQ, OQ and PQ **[10]**

Q3) Write short note **[20]**

a) Vendor certification.

b) Validation of integrated line by media fill test

SECTION - II

Q4) a) Discuss any five parameters of analytical method validation. **[10]**

b) Explain validation of UV/Visible spectrophotometer. **[10]**

P.T.O.

Q5) a) Write importance of process validation and explain validation of coated tablet formulation. **[10]**

b) Write validation of HVAC **[10]**

Q6) Write short note on **[20]**

a) Validation of tablet compression machine.

b) Cleaning method validation.

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Total No. of Questions : 8]

SEAT No. : ____

[Total No. of Pages : 2

P806

[4356] - 211

M.Pharmacy

(SPl. Quality Assurance Techniques)

QUALITY PLANNING & ANALYSIS

(Theory) (2008 Pattern) (Semester - II)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates:

1) ***Question Nos. 1 and 5 are compulsory.***
2) ***Answer any two questions from section I and any two questions from section II.***
3) ***Answers to the two sections should be written in separate answer books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain with appropriate examples the role of Quality control and quality assurance in pharmaceutical industry. **[12]**

Q2) How the quality can be improved and cost can be reduced in industry. How it can be responsible for the progress of the industry. **[14]**

Q3) How the quality culture can be developed in the industry. **[14]**

Q4) Write short notes : (Any Two) **[14]**

a) Juran's triology.

b) Quality audits.

c) Motivation.

P.T.O.

SECTION - II

Q5) Explain how the quality can be maintained and achieved in manufacturing. **[12]**

Q6) Explain in detail the statistical process control. **[14]**

Q7) Explain the role of inspection in maintaining quality. **[14]**

Q8) Write short notes : (Any Two) **[14]**

a) Sampling.

b) Chronic quality problems.

c) Quality survey.

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Total No. of Questions : 6]

SEAT No. :

P778

[Total No. of Pages : 2

[4356]-101
M.Pharmacy
ADVANCED ANALYTICAL TECHNIQUES
(2008 Pattern) (Semester - I)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Attempt any two questions from each section.***
2) ***Draw diagrams where necessary.***

SECTION - I

Q1) a) Elucidate the structure from the following data : **[8]**

Molecular formula : C_8H_8O

IR : 1703 cm^{-1}, 2733 cm^{-1}, 2828 cm^{-1}, 2922 cm^{-1}, 3048 cm^{-1}.

H^1NMR :	2.4δ	Singlet	3H
	7.3 - 7.8 δ	Symmetric multiplet	4H
	9.9 δ	Singlet	1H

Justify your answer with proper assignment of values to the structure.

b) What is Bragg's equation? Derive it. Discuss its application in X-ray diffractometry. **[8]**

c) Write a note on detectors in HPLC. **[4]**

Q2) a) What advantages do FTIR spectrophotometers offer over dispersive instruments? Explain the working of Michelson's interferometer. **[10]**

b) Describe the theory, instrumentation and applications of Differential Scanning calorimetry. **[10]**

Q3) a) What are the reasons for NMR spectroscopy being much less sensitive for C^{13} nucleus than for H^1 nucleus? Explain the terms FID signal and NOE in NMR spectroscopy. **[10]**

b) Use a phase diagram to explain the meaning of super critical fluids. What makes CO_2 the best choice for SFC? Discuss instrumentation of SFC. **[10]**

P.T.O.

SECTION - II

Q4) a) Discuss the instrumentation for sample application, development of plates, detection and quantization in HPTLC. **[10]**

b) Discuss the fragmentation in mass spectrometry for the following classes of compounds. **[10]**

i) Alkenes
ii) Carboxylic acids
iii) Substituted benzenes
iv) Amines

Q5) a) Write a note on ESR spectroscopy. **[8]**

b) Use the Van Deemter equation to comment on the better performance of UPLC over HPLC. **[5]**

c) Give a brief account of the atmospheric pressure ionization techniques in LC-MS. **[7]**

Q6) a) Write short notes on : **[10]**

i) Detectors used in GC
ii) Ion pair chromatography

b) Discuss the sample handling techniques for gases, liquids and solids in IR spectroscopy. Write a note on ATR in IR spectroscopy. **[10]**

Total No. of Questions : 6]

SEAT No. :

P780

[Total No. of Pages : 1

[4356]-103
M.Pharm.
(Spl. Pharmaceutics)
ADVANCED PHARMACEUTICS
(2008 Pattern) (Semester - I)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Answer any two questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain physics of tablet compression and lubricant sensitivity. **[20]**

Q2) Explain different methods of Polymer characterization. **[20]**

Q3) Explain the following : **[20]**

a) Non-isothermal method of stability testing.

b) Statistical aspects of stability studies.

SECTION - II

Q4) Explain the following : **[20]**

a) Sources of variation & role of documentation in quality Assurance.

b) Statistical quality control.

Q5) Explain concept of dissolution & discuss different dissolution apparatus mentioned in USP. (Draw a neat figure to support your answer). **[20]**

Q6) Discuss the theory, methods & applications of microencapsulation. **[20]**

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Total No. of Questions : 6]

SEAT No. :

P782

[Total No. of Pages : 2

[4356]-105
M.Pharm.
(Spl. Pharmacology)
ADVANCED PHARMACOLOGY
(Preclinical Evaluation of Drugs)
(2008 Pattern) (Semester - I) (M - III - 1)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Answer any two questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) a) What do you mean by CPCSEA? As per CPCSEA norms. What are ethical requirements for animal experimentation? **[10]**

b) Discuss preclinical evaluation of analgesics. **[10]**

Q2) a) Explain patch clamp technique as a modern method of pharmacological evaluation. **[10]**

b) How will you screen antifertility agents using various animal models. **[10]**

Q3) a) Constitution of IAEC. **[5]**

b) Role of CPCSEA nominee. **[5]**

c) Evaluation of diuretic agent. **[5]**

d) Limitations of invitro testing methods. **[5]**

SECTION - II

Q4) a) Enlist various modern methods of pharmacological evaluation. Add a note on radioligand binding assays. **[10]**

b) Discuss preclinical evaluation of anticholinergics. **[10]**

Q5) a) Enlist various proformas for animal experimentation. Discuss in details proforma-B. **[10]**

b) What are various animal models for screening of nontropic agents. Add a note on it's advantages and disadvantages. **[10]**

P.T.O.

Q6) a) Dark-light cycle in animal house. **[5]**

b) Breeding of animals. **[5]**

c) ELISA. **[5]**

d) Preclinical evaluation of hypnotics. **[5]**

Total No. of Questions : 6]

SEAT No. :

P786

[Total No. of Pages : 1

[4356]-109

M.Pharmacy

PHARMACEUTICAL PLANT DESIGN AND OPERATIONS

(2008 Pattern) (Semester - I & II) (Elective)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Answer any two questions from each section.***
2) ***Answer to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Discuss the design, layout and operational facilities for dry syrups. **[20]**

Q2) Explain in detail regulatory requirements of pharma facilities with reference to revised schedule M & Factory Act. **[20]**

Q3) Discuss the design, layout and operational facilities for sterile powders ready for reconstitution. **[20]**

SECTION - II

Q4) Discuss in detail design of effluent treatment plant. **[20]**

Q5) Explain the design of utility services as water stream compressed air & other gases. **[20]**

Q6) Discuss design of plant support services in a pharmaceutical plant. **[20]**

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Total No. of Questions : 8]

SEAT No. :

P791

[Total No. of Pages : 2

[4356]-114
M.Pharmacy
CLINICAL TRIALS
(2008 Pattern) (Elective) (Semester - I & II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Question Nos. 1 and 5 are compulsory. Out of the remaining attempt 2 questions from Section I and 2 questions from Section II.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Outline the new drug development process & discuss in detail various phases of clinical trial. **[10]**

Q2) Discuss in detail informed consent process with emphasis on special considerations in informed consent process. **[15]**

Q3) Explain in detail steps involved in designing of clinical trial. **[15]**

Q4) Write short notes on (any three) : **[15]**

a) IND, NDA & ANDA.

b) Inclusion & exclusion criteria.

c) Institutional review board.

d) The Belmont Report.

SECTION - II

Q5) Define protocol. Enlist & discuss in detail elements of a typical clinical trial protocol. **[10]**

Q6) Discuss role & responsibilities of various stakeholders of clinical trials in management of clinical trial. **[15]**

P.T.O.

Q7) Discuss concept & importance of ICH-GCP guidelines. **[15]**

Q8) Write short notes on (any three) : **[15]**

a) Therapeutic Drug Monitoring.

b) Computer Applications in data analysis of clinical trials.

c) Role of pharmacovigilance in monitoring adverse events.

d) Statistical tests used in clinical trials.

Total No. of Questions : 12]

SEAT No. :

P793

[Total No. of Pages : 2

[4356]-116

M.Pharmacy (Semester - I & II)

TRADITIONAL SYSTEMS OF MEDICINE AND AYURVEDIC FORMULATIONS

(2008 Pattern) (Elective)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Answer any 4 questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) What is Homeopathy system of medicine? Write theory and basic concept along with brief history of Homeopathy system of medicine. Write a note on diagnosis and treatment of Homeopathy system of medicine. **[10]**

Q2) Write down the differences between Ayurvedic medicines and Chinese medicines with respect to history, philosophy and preparation of medicines. **[10]**

Q3) Enlist Five drugs used in Ayurvedic medicines and Unani medicines. Give their comparative account. **[10]**

Q4) What is Ethnopharmacognosy? Explain the role of Ethnopharmacognosy in modern drug discovery. **[10]**

Q5) Explain in detail method of preparation, characteristics and uses of Kwatha. **[10]**

Q6) Write short note on any two : **[10]**

a) Role of "Chikitsa Stana" in Ayurvedic system of medicine.

b) Guggulu.

c) Rasayana.

P.T.O.

SECTION - II

Q7) Define Churna. Write its method of preparation, characteristics and storage conditions. Enlist four examples of Churna along with their therapeutic uses. **[10]**

Q8) Define Ghruta. Write its method of preparation, characteristics and storage conditions. Enlist four examples of Ghruta along with their therapeutic uses. **[10]**

Q9) Explain in detail traditional fermented biomedicines from Ayurveda along with their method of preparation and characteristics. Enlist two examples of each of these formulations along with their therapeutic uses. **[10]**

Q10) Describe in detail Biological methods of standardization of Ayurvedic dosage forms and their significance in standardization. **[10]**

Q11) Describe in detail Ayurvedic cosmetic formulations. **[10]**

Q12) Write short note on (any two) : **[10]**

a) Preparation of Bhasma.

b) Avaleha.

c) Arka.

Total No. of Questions : 6]

SEAT No. :

P799

[Total No. of Pages : 2

[4356]-204
M.Pharmacy
(Pharmaceutical Chemistry)
ADVANCED MEDICINAL CHEMISTRY (M-II-3)
(2008 Pattern) (Theory) (Semester - II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Q.No.1 & Q.No.4 are compulsory.***
2) ***Solve any one question from remaining questions from each section.***

SECTION - I

Q1) a) Write applications of microorganisms in biotransformation of antibiotics with examples. **[12]**

b) Explain Role of QSAR in drug design. **[8]**

Q2) a) Discuss various theories of drug receptor Interactions. **[10]**

b) Sketch out the synthetic strategies for any one of the following : **[10]**
i) Dapsone ii) Diphenylhydramine

Q3) Write a note on (any two) : **[20]**

a) Application of Gene Therapy.
b) Whole Cell Immobilization.
c) Various aspects of combinatorial chemistry.

SECTION - II

Q4) a) Write in detail the applications of CADD in drug discovery process with examples. **[12]**

b) Explain enzyme immobilization techniques. **[8]**

Q5) Write synthetic Routes giving reaction conditions & mechanism involved in following drugs. (any two) **[20]**

a) Risperidone
b) Ethinyl estradiol
c) Diazepam.

P.T.O.

Q6) Write a note on (Any two) : **[20]**

a) GABA Receptor.

b) Adrenegic Receptors & their drug legand.

c) Opoid Receptor.

d) Histamine Receptor.

Total No. of Questions : 6]

SEAT No. :

P801

[Total No. of Pages : 2

[4356]-206
M.Pharmacy (Semester - II)
(Spl. Pharmacology)
CLINICAL PHARMACOLOGY
(2008 Pattern) (M-III-3)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Answer any two questions from each section.***
2) ***Answer to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) a) Discuss principles of therapeutic drug monitoring with suitable examples. **[10]**

b) Justify need of renal transplantation and explain post transplantation drug dose adjustments. **[10]**

Q2) a) What do you mean by clinical evaluation of drug? Discuss in detail phases of clinical trials. **[10]**

b) Explain clinical practice guide lines and management of angina pectoris. **[10]**

Q3) a) Role of tissue transplantation in immunopharmacology. **[5]**

b) Resistance to antibiotics. **[5]**

c) General principles of Cancer Chemotherapy. **[5]**

d) Management of constipation. **[5]**

SECTION - II

Q4) a) How will you manage chronic renal failure? **[10]**

b) Justify role of invitro tests in immunological investigation with suitable examples. **[10]**

Q5) a) Describe clinical practice guidelines for hepatitis. **[10]**

b) Discuss ethics in clinical trials with examples. **[10]**

P.T.O.

Q6) a) Management of coagulation disorders. **[5]**

b) Role of renal dialysis in renal diseases. **[5]**

c) Drug allergy. **[5]**

d) Rational use of antibiotics. **[5]**