Total No. of Questions : 6]

SEAT No. :

P3571

[Total No. of Pages : 2

[4750] - 11

M.Pharmacy (Semester - I)

ADVANCED ANALYTICAL TECHNIQUES

(2008 Pattern)

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

Instructions to the candidates:

1) ***Question No. 1 and 4 are compulsory.***
2) ***Attempt any one question from the remaining in Section - I and any one from the remaining question of Section - II.***
3) ***Answer to the two sections should be written on the separate books.***
4) ***Draw diagram whenever necessary.***
5) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) A compound with molecular weight 116 gives following structural information

UV: 283mμ, ε_{max} 22

IR : 3000-2500, 1715, 1342 cm^{-1}

NMR : 7.88 τ Singlet (3H), 7.40 τ Triplet (2H), 7.75 τ Triplet (2H), 1.1 τ singlet (1H) Deduce the structure of the compound. **[8]**

b) Discuss various transitions in UV spectroscopy. **[8]**

c) Give applications of IR spectroscopy. **[4]**

Q2) a) Discuss in detail theory, instrumentation and applications of NMR spectroscopy. **[8]**

b) Write about Finger Print region in IR spectroscopy. **[8]**

c) Write about Emission spectroscopy. **[4]**

P.T.O.

Q3) a) Give an account of theory, instrumentation and applications of mass spectroscopy. **[8]**

b) Discuss about Chromophores in UV Spectroscopy. **[8]**

c) Write note on HPTLC. **[4]**

SECTION - II

Q4) a) Write about theory, instrumentation and application of HPLC. **[10]**

b) Discuss theory, instrumentation and application of GC-MS. **[10]**

Q5) a) Give an account of Differential Scanning Calorimetry. **[10]**

b) Write about Derivative Thermogravimetric analysis. **[10]**

Q6) a) Write about Ion pair Chromatography. **[10]**

b) Explain theory and applications of X-ray diffraction techniques. **[10]**

Total No. of Questions : 6] SEAT No. :

P3572 [Total No. of Pages : 1

[4750] - 12
M.Pharmacy (Semester - I)
RESEARCH METHODOLOGY
(2008 Pattern)

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

Instructions to the candidates:

1) ***Questions 1 and 4 are compulsory.***
2) ***Attempt any one questions from the remaining in Section - I and any one questions from the remaining questions of Section - II.***
3) ***Answers to the two sections should be written in separate books.***

SECTION - I

Q1) a) Give an account of sources for survey of literature. **[10]**

b) Explain process of making a research proposal. **[10]**

Q2) a) Describe the various types of research in detail. **[10]**

b) Explain in detail student t test. **[10]**

Q3) a) What is interpretation of data? Give the need and importance of interpretation of data. **[10]**

b) Discuss the different forms of questionnaire. Give its advantages and disadvantages. **[10]**

SECTION - II

Q4) a) What is a patent? Describe importance of patent in research. **[10]**

b) Explain the importance of poster, gesture, eye contact and expressions in oral presentation. **[10]**

Q5) Why protection is needed on intellectual property? Give the detailed account of historical development of concept of intellectual property rights. **[20]**

Q6) Write notes on any two of the following : **[20]**

a) Industrial project as part of industry institute interaction.

b) Trademark designs and copyrights.

c) Status of intellectual property rights in India.

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Total No. of Questions : 6] **SEAT No. :**

P3573 **[Total No. of Pages : 2**

[4750]-13

M.Pharm. (Semester - I)

ADVANCED PHARMACEUTICS

(2008 Pattern)

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

Instructions to the candidates:

1) ***Attempt any 2 questions from each section.***
2) ***Draw well labeled diagram wherever necessary.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain in detail the importance and methodology of stability testing of pharmaceutical dosage forms. **[20]**

Q2) Explain different parameters studied in preformulation of a solid dosage form. Add a note on solid state characterization. **[20]**

Q3) Write short notes on (any two) : **[20]**

a) Characterization of polymers.

b) Co-processed excipients.

c) Biodegradable polymers.

P.T.O.

SECTION - II

Q4) Explain the experimental design approach used in the optimization of formulations. Write a note on classification of optimization methods. **[20]**

Q5) Discuss the applications and evaluation of microcapsules. Explain in detail any one technique used for the preparation of microcapsules. **[20]**

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

a) Correlation and regression analysis.

b) Importance of Dissolution.

c) Quality assurance and quality control.

Total No. of Questions : 8]

SEAT No. : ____

P3574

[Total No. of Pages : 2

[4750] - 14

M. Pharmacy (Semester - I)

ADVANCED PHARMACEUTICAL CHEMISTRY

Spl. Pharmaceutical Chemistry

(2008 Pattern)

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

Instructions to the candidates:

1) ***Question number one and five are compulsory out of remaining attempt any 2 questions from each Section I and Section II.***
2) ***Figures to the right indicate full marks.***
3) ***Draw well labeled diagrams wherever necessary.***

SECTION - I

Q1) Explain Sharpless oxidation. **[10]**

Q2) Give brief account of green chemistry. Explain reactions using microwave and ultrasound energy. **[15]**

Q3) Explain Synthon approach for drug synthesis. Develop synthetic route for any two drugs using synthon approach. **[15]**

Q4) Write note on any Two : **[15]**

a) Allylic bromination

b) Free radical reaction

c) Oppennauer oxidation

P.T.O.

SECTION - II

Q5) Explain mechanism, stereochemistry and applications of Grignard reaction. **[10]**

Q6) What is Pinacole - pinacolone rearrangement, explain along with reaction mechanism, stereochemistry and applications. **[15]**

Q7) Explain Stereospecificity and Stereoselectivity with suitable examples. **[15]**

Q8) Write note on any Two : **[15]**

a) Suzuki coupling

b) Wolf Kishner reduction

c) Ionic liquid and Supercritical liquid

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Total No. of Questions : 6]

SEAT No. :

P3575

[Total No. of Pages : 1

[4750] - 15

M. Pharmacy (Semester - I)

ADVANCED PHARMACOLOGY - I

(2008 Pattern)

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

Instructions to the candidates:

1) ***Answers to each section should be written in separate answer - books.***

2) ***Solve any two questions from each section.***

SECTION - I

Q1) Discuss the preclinical evaluation of antihypertensive agents. **[20]**

Q2) Discuss the preclinical evaluation of bronchodilators and antitussives. **[20]**

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

a) Patch clamp technique.

b) Screening of anti - parkinsonian agents.

c) Transgenic animals.

SECTION - II

Q4) Discuss the preclinical evaluation of anxiolytics and antidepressants. **[20]**

Q5) Discuss the preclinical evaluation of cardiac glycosides and antiarrhytmatic agents. **[20]**

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

a) Screening of local anaesthetics.

b) Breeding techniques for laboratory animals and CPCSEA guidelines for breeding of laboratory animals.

c) RIA.

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Total No. of Questions : 8] SEAT No. :

P3576

[Total No. of Pages : 2

[4750] - 16
M. Pharmacy (Semester - I)
ADVANCED PHARMACOGNOSY
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question No.1 and Question No. 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 answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***

SECTION - I

Q1) Explain various strategies used to enhance secondary metabolite production through tissue culture techniques. **[10]**

Q2) Answer the following :

a) Explain application of tracer techniques in evaluation of biogenetic pathways of secondary metabolites. **[7]**

b) Illustrate flavonoids as chemotaxonomic marker with suitable example. **[8]**

Q3) Explain the characteristics of natural products that make them appropriate material in discovering new drugs. Describe Vinca alkaloids as anticancer agent. **[15]**

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

a) Application of Chemotaxonomy in medicinal botany.

b) Advantages of Chemotaxonomy.

c) Strategies for selection of plant material for HTS.

d) Flavouring agents derived from plants.

P.T.O.

SECTION - II

Q5) Elaborate a detail account of Flavanoids as Hypolipidaemic agents with suitable examples. **[10]**

Q6) Answer the following:

a) Explain anticancer role of Taxol and its derivatives. **[7]**

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

Q7) Write various *in vivo* models used for evaluation of Immunomodulatory activity. Explain Ginseng as immunomodulatory agent. **[15]**

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

a) Androgapholide as a Hepatoprotective agent.

b) Biopolymers as Pharmaceutical Excipients.

c) Photosentizing agents derived from plants.

d) Biofuels.

Total No. of Questions : 8] SEAT No. :

P3577

[Total No. of Pages : 1

[4750] - 17
M.Pharmacy (Semester - I)
ADVANCED QUALITY ASSURANCE TECHNIQUES
(c GMP & Documentation)
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question numbers 1 and 5 are compulsory.***
2) ***Out of the remaining attempt any two questions from each section.***
3) ***Answer to the two sections should be written in separate answer books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Discuss SOP on handling market complaints. **[12]**

Q2) Explain the importance of time limit at various stages in manufacture. Add a note on sanitation in manufacturing area. **[14]**

Q3) Write a note on "Drug product salvaging" **[14]**

Q4) Discuss importance of Environmental Protection in pharmaceutical industry. **[14]**

SECTION - II

Q5) Write a note on design and structural features of manufacturing facility. Add a note on HVAC system. **[12]**

Q6) Discuss contents of "Site Master File" **[14]**

Q7) a) Explain maintenance of equipments in pharma manufacturing

b) What is outsourcing? **[14]**

Q8) What are the requirements for Expiration dating as per cGMP? Add a note on reference standards. **[14]**

Total No. of Questions : 8] **SEAT No. :**

P3578 **[Total No. of Pages : 2**

[4750]-18

M. Pharmacy (Semester - I)

Traditional System of Medicine and Ayurvedic Formulations

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q. no. 1 and 5 are compulsory.***
2) ***Out of the remaining attempt any two questions from Section I and any two questions from Section - II.***
3) ***Answers to the Two sections should be written in separate books.***
4) ***Figures to right indicate full marks.***

SECTION - I

Q1) Explain Unani system of medicine. Give the theory and basic concept and add a brief note on Diagnosis and treatment of Unani system of medicine. [**10**]

Q2) a) Explain the principle of Ayurveda and add a note on Panchakarma [**8**]

b) What is Homeopathy system of medicine. Write a brief note on Homeopathic dilutions [**7**]

Q3) Give an account of Ethnopharmacognosy in modern drug discovery [**15**]

Q4) Write short notes (Any Three) [**15**]

a) Charak Samhita

b) Principle of Chinese system of medicine

c) Rasayan in Ayurveda

d) Acupuncture.

P.T.O.

SECTION - II

Q5) Write in detail about preparation of Bhasma in Ayurveda. Give the characteristics, evaluation parameters and storage conditions of Bhasmas.[**10**]

Q6) What is Asava and Arishta. Give their methods of preparation with examples[**15**]

Q7) Define Standardization and explain in detail Physical, Chemical and Microscopical methods of evaluation of herbal drugs. [**15**]

Q8) Write short notes (Any Three) [**15**]

a) Churna

b) Taila

c) Lepa and Kvatha

d) Ghruta.

Total No. of Questions : 6]

SEAT No. : ____

P3579

[Total No. of Pages : 2

[4750] - 19

M. Pharmacy (Semester - I & II)

BIOPHARMACEUTICS AND PHARMACOKINETICS

(2008 Pattern) (Elective)

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

Instructions to the candidates:

1) ***Answer any 02 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) ***All questions carry equal marks.***

SECTION - I

Q1) What is in vitro in vivo corelation (IVIVC) ? Explain the need and objectives of IVIVC. Discuss various levels of IVIVC.

Q2) Discuss the methods of determination of rate of absorption.

Q3) Write notes on any two -

a) Noyes - Whitney's dissolution rate law.

b) Physiological transporter systems.

c) In vitro models for determination of absorption.

P.T.O

SECTION - II

Q4) Write on assessment of various pharmacokinetic parameters when the drug in administered as IV infusion. Explain the need of loading dose in this case.

Q5) Discuss kinetics of protein binding.

Q6) Write notes on any two -

a) Michaelis - Menten equation.

b) Causes and detection of nonlinearity.

c) Concept of clearance and its determination.

Total No. of Questions : 8] **SEAT No. :**

P3580 **[Total No. of Pages :2**

[4750]-20
M. Pharm. (Semester - I & II)
STERILE PRODUCTS FORMULATION AND TECHNOLOGY
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question No. 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) ***Draw a neat and labeled diagrams wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain in detail methods of preparation of liposomes and applications of liposomes for parenteral delivery. **[12]**

Q2) Explain in detail formulation and manufacturing of parenteral solution. **[14]**

Q3) Write a note on physicochemical properties of the drug studied during preformulation of the parenteral product. **[14]**

Q4) Write a short note on (Any Two) : **[14]**

a) Ocular inserts

b) Loaded erythrocyte

c) Plastic as a packaging component for parenteral product.

P.T.O.

SECTION - II

Q5) Explain components of HEPA filter. Write a note on HEPA filter testing and Rating. **[12]**

Q6) What are different large scale sterilization process? Give the account of validation of Autoclave. **[14]**

Q7) Write a note on GMP and regulatory guidelines for the manufacturing of parenteral product. **[14]**

Q8) Write a short note on (Any Two) : **[14]**

a) Parenteral devices-canula and catheter

b) Layout of parenteral facility

c) Mechanism, advantages and drawbacks of autoclave sterilization

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Total No. of Questions : 8] SEAT No. :

P3581

[Total No. of Pages : 2

[4750] - 21
M.Pharmacy. (Semester - II)
DRUG REGULATORY AFFAIRS
(2008 Pattern)

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) ***Answer to the two sections should be written in separate books.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Write the constitution and composition of the State Pharmacy Councils. **[10]**

Q2) a) Write the salient features of Indian Patent Act 1970. **[8]**

b) Write the salient features of DPCO 1995. **[7]**

Q3) a) Explain the provisions related to Pollution and Environment Control Act. **[8]**

b) Write the qualification and duties of Drug Inspector. **[7]**

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

a) Labeling of drugs.
b) Drug Master File
c) ISO
d) USFDA

SECTION - II

Q5) Explain the Schedule-M requirements related to premises, sanitation & hygiene. **[10]**

Q6) a) Write the functions of Central Drugs Laboratory. **[8]**

b) Write in detail about import of drugs. **[7]**

Q7) a) Elaborate the different sections of NDA. **[8]**

b) Write the conditions of loan license to manufacture for sale of drugs. **[7]**

P.T.O.

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

a) Pharmacopeias.

b) Good Clinical practices.

c) WHO

d) MSDS preparation

Total No. of Questions : 6] **SEAT No. :**

P3582 **[Total No. of Pages : 2**

[4750] - 22

M.Pharmacy (Semester - II)

ADVANCED MEDICINAL CHEMISTRY (M-II-3)

(Pharmaceutical Chemistry)

(2008 Pattern) (Theory)

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

Instructions to the candidates:

1) ***Q.No.1 and Q.No.4 are compulsory.***
2) ***Attempt any one question from remaining questions from each section.***
3) ***Write answers to section I and Section II in separate answer book.***

SECTION - I

Q1) a) Write applications of microorganisms in biotransformation of antibiotics. **[15]**

b) Write a note on enzyme immobilization techniques. **[5]**

Q2) a) What are the different types of receptors ? Explain the adrenergic receptors. **[15]**

b) Explain supporters and linkers in combinatorial chemistry. **[5]**

Q3) a) Explain applications of QSAR in drug design. **[10]**

b) Write a brief note on CADD. **[10]**

P.T.O.

SECTION - II

Q4) Write Synthetic routes giving detail mechanism of following drugs describing reaction conditions: (Any Two) **[20]**

a) Gefitinib

b) Risperidone

c) Linezolide

d) Diazepam

Q5) a) Write a note on Combinatorial chemistry. **[10]**

b) Draw synthesis scheme with detail mechanism of Diphenhydramine. **[10]**

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

a) Enzyme inhibition

b) Gene therapy

c) Dopamine receptors

Total No. of Questions : 6]

SEAT No. :

P3583

[Total No. of Pages : 2

[4750] - 23

M.Pharm. (Semester - II)

CLINICAL PHARMACOLOGY

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q. 1 & Q.4 are compulsory.***
2) ***Solve any one question from remaining two for each section.***

SECTION - I

Q1) Describe in detail the management of hypertension. **[20]**

Q2) a) Describe in detail pharmacotherapy of hyperlipidemia. **[10]**

b) Chronic obstructive pulmonary disease. **[10]**

Q3) a) Rational use of antibiotics. **[5]**

b) Management of angina pectoris. **[5]**

c) Role of immunomodulators in immunopharmacology. **[5]**

d) Antiemetics. **[5]**

SECTION - II

Q4) Define clinical pharmacology. Describe the different phases of clinical research. Add a note on controlled clinical trials. **[20]**

Q5) a) Discuss principles of therapeutic drug monitoring with suitable examples. **[10]**

b) Explain clinical practice guidelines and management of pulmonary embolism. **[10]**

P.T.O.

Q6) a) Management of peptic ulcer **[5]**

b) Anticoagulants **[5]**

c) Digitalis glycosides **[5]**

d) Therapeutic utility of beta blockers in myocardial infarction **[5]**

Total No. of Questions : 8]

SEAT No. :

P3584

[Total No. of Pages : 2

[4750] - 24

M. Pharmacy (Semester - II)

PHYTOCHEMISTRY AND PHYTOPHARMACEUTICALS

(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 2 questions from Section I and 2 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) Describe in brief chemistry of flavonoids. How are flavonoids isolated? Explain with example of Quercetin. **[10]**

Q2) a) Write method of extraction, characterization & structural elucidation of Morphine. **[7.5]**

b) Write an elaborate account on chemical & pharmacological profile of **any one** of the following: **[7.5]**

i) Sennosides

ii) Taxol

Q3) What do you understand by Standardization of phytopharmaceuticals? Mention the role of spectroscopy & chromatographic techniques in Standardization of Bacosides and Curcumin. **[15]**

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

a) Chemical Profile of Digoxin.

b) Extraction of alkaloids.

c) Standardization of phylanthin

P.T.O.

SECTION - II

Q5) Describe WHO guidelines for quality control of herbs. Write principle & procedure of Bitterness value. **[10]**

Q6) a) Describe the infrastructure required for production of herbal extracts. **[7.5]**

b) Write a note on evaluation of herbal extracts. **[7.5]**

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

a) Hepatoprotectives.

b) Antioxidants.

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

a) Sterlity, stability & Preservation of extracts.

b) Screening of Antiinflammatory Drugs.

c) Determination of pesticide residue.

Total No. of Questions : 6] SEAT No. :

P3585

[Total No. of Pages : 1

[4750] - 25
M. Pharmacy (Semester - II)
PHARMACEUTICAL VALIDATION
(Spl. Quality Assurance Techniques)
(2008 Pattern)

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

Instructions to the candidates:

1) ***Q.1 and Q.5 are compulsory. Out of remaining solve any 1 from Section I and any 1 from Section II.***
2) ***Figures to the right indicate full marks.***

SECTION - I

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

b) What is validation master plan? Elaborate its contents. **[10]**

Q2) a) Define calibration and write a note on calibration master plan. **[10]**

b) Explain equipment validation of steam autoclave. **[10]**

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

a) Operation qualification and performance qualification.

b) Vendor certification.

SECTION - II

Q4) a) Explain process validation of tablet by dry granulation. **[10]**

b) Write short note on cleaning method validation. **[10]**

Q5) Explain validation of the following utility service: HVAC. **[20]**

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

a) Computer system validation.

b) Performance of UV visible spectrophotometer.

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Total No. of Questions : 8]

SEAT No. :

P3586

[Total No. of Pages : 2

[4750] - 26
M. Pharmacy (Semester - II)
FORMULATIONS AND DEVELOPMENT
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question No. 1 and 5 are compulsory. Out of the remaining attempt two questions from section - I and two questions from Section - II.***
2) ***Answers to 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 various approaches for taste masking. **[12]**

Q2) Explain the concept of Gastro retentive drug delivery systems. **[14]**

Q3) What are the characteristics of ideal package? Discuss the regulatory Perspective of selection of Pharmaceutical packaging meterial for various formulations.**[14]**

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

a) Self emulsified drug delivery systems.

b) Excipients used for pulsatile drug delivery systems.

c) Buccal formulations.

SECTION - II

Q5) Discuss role of propellants in inhalation aerosols. Add a note on quality assurance of Aerosol formulation. **[12]**

Q6) Discuss need problems in veterinary dosage forms. Explain formulation strategy to administer veterinary dosage forms via drinking water. **[14]**

P.T.O.

Q7) Discuss in detail generation and significance of Nanopharmaceuticals. **[14]**

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

a) Penetration enhancer in semisolid formulation

b) Semisolid based on Niosomes.

c) Metered dose inhalers.

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Total No. of Questions : 6] **SEAT No. :**

P3587

[Total No. of Pages : 2

[4750] - 27
M.Pharmacy (Spl. Pharmaceutical Chemistry) (Semester - II)
DRUG DESIGN
(2008 Pattern) (M-II-4)

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

Instructions to the candidates:

1) ***Question Nos. 1 & 4 is compulsory.***
2) ***Answer any one question from Section - I and any one question from Section - II from the remaining.***
3) ***Answer to the two sections should be written on separate books.***
4) ***Figures to the right indicate full marks.***

SECTION -I

Q1) a) Enlist various physicochemical properties of drug molecule that affects the biological activity. Explain in brief about effect of ionization and hydrogen bonding on biological activity with suitable examples. **[15]**

b) Write significance ofA.D.M.E in drug design. **[5]**

Q2) a) What are prodrugs? Write about designing of drug based on metabolism studies with examples. **[15]**

b) Bioprecursor prodrugs. **[5]**

Q3) Explain in brief about QSAR with its advantage and application. Discuss Hansch's Model. **[20]**

SECTION -II

Q4) Explain the concept of antagonism and enzyme inhibition were proved to be excellent tools in the process of drug design with suitable examples. **[20]**

Q5 a) Write a note on indirect drug design. **[10]**

b) Explain in brief about conformational search technique in CADD. **[10]**

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

a) Three dimensional QSAR.

b) Steric features of drug and their effects on the biological activity.

c) Craig plot & cluster analysis.

Total No. of Questions : 6] SEAT No. :

P3588 [Total No. of Pages : 2

[4750] - 28
M. Pharmacy (Semester - II)
MOLECULAR PHARMACOLOGY
(Spl. Pharmacology)
(2008 Pattern)

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 answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) a) Discuss the recent advances in drugs acting on dopamine receptors. **[10]**

b) Enlist the various endogenous bioactive molecules. Add note on modulators of NO and endothelin. **[10]**

Q2) a) Discuss the recent advances in drugs acting on GABA and benzodiazepine receptors. **[10]**

b) What are reactive oxygen intermediates? Explain therapeutic implications of antioxidants. **[10]**

Q3) a) Purinergic receptors and modulators. **[5]**

b) Neurosteroids. **[5]**

c) Glutamte receptors. **[5]**

d) Transgenic animals in experimental pharmacology. **[5]**

P.T.O

SECTION - II

Q4) a) Define immunopharmacology. Explain antibody mediated immunity. **[10]**

b) Discuss the implications of Human Genome Mapping in Drug research. **[10]**

Q5) a) Explain the process of Apoptosis with its clinical implications. **[10]**

b) Explain role of chronopharmacology on drug therapy. **[10]**

Q6) a) Cholinergic receptors. **[5]**

b) Arachidonic acid derived metabolites. **[5]**

c) Drugs acting on hormone receptors. **[5]**

d) Sodium channel modulators. **[5]**

Total No. of Questions : 8] SEAT No. :

P3589 [Total No. of Pages : 2

[4750] - 29

M. Pharmacy (Semester - II)

NOVEL DRUG DELIVERY SYSTEM

(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) ***Answer to two sections must be written in separate answer books.***

SECTION - I

Q1) What is chrono therapeutics? Describe formulation of and evaluation of pulsatile drug delivery system. **[20]**

Q2) Describe mechanisms of transports of drugs through mucosal routes? Write a note on penetration enhancers. **[20]**

Q3) Give detailed account of formulation mechanisms in gastric retentive drug delivery system. **[20]**

Q4) Write short notes (any two) : **[20]**

a) Influence of drug properties on design of sustained release drug delivery systems.

b) Biodegradable microspheres.

c) Osmotic drug delivery.

P.T.O

SECTION - II

Q5) Describe evaluation of colon targeted drug delivery. **[20]**

Q6) Drug targeting using monoclonal antibodies. **[20]**

Q7) Describe formulation considerations for protein and peptide drugs. **[20]**

Q8) Write notes on (any two) : **[20]**

a) Microbial approach for colon specific drug delivery formulation.

b) Enhanced permeation and retention effect.

c) Formulation of transdermal drug delivery system.

Total No. of Questions : 8]

SEAT No. :

P3590

[Total No. of Pages : 1

[4750] - 30

M. Pharm. (Semester - II)

INDUSTRIAL PHARMACOGNOSY

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q. No. I and Q. No. 5 are compulsory, Out of remaining solve any two from Section I and Section II.***

2) ***Answer to the two Sections should be written in separate books.***

SECTION-I

Q1) Explain the demand for Medicinal Plants and Herbal medicine. **[10]**

Q2) Describe the export potential for Spices, Phytopharmaceutical products and Medicinal Plants used in cosmetics and aromatherapy. **[15]**

Q3) Discuss the technology involved in production of. **[15]**

a) Emetine
b) Diosgenin
c) Cocaine

Q4) Express in brief the Global regulatory requirements for Herbal Medicines. **[15]**

SECTION-II

Q5) Elaborate in detail salient features of Indian Patent Act. **[10]**

Q6) Give in brief the classification of Medicinal Plants based industries for medicinal and aromatic plants in India. **[15]**

Q7) Comment on
"Technical steps involved in extraction of Medicinal Plants" **[15]**

Q8) Clarify the contribution of Medicinal Plants in economic growth potential of India. **[15]**

Total No. of Questions : 8]

SEAT No. : ____

P3591

[Total No. of Pages : 2

[4750] - 31

M.Pharmacy (Semester - II)

QUALITY PLANNING AND ANALYSIS

(2008 Pattern)

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

Instructions to the candidates:-

1) ***Question numbers 1 and 5 are compulsory.***
2) ***Out of the remaining attempt any two questions from each section.***
3) ***Answers to the two sections should be written in separate answer books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Define 'Control' and list universal sequence of steps to achieve control. Add a note on self control. **[12]**

Q2) Discuss steps in structuring an audit program. Write a note on audit report. **[14]**

Q3) How is quality measured in manufacturing operations? Comment on 'Quality culture'. **[14]**

Q4) Write the criteria for 'self inspection' and comment on inspection accuracy. **[14]**

P.T.O.

SECTION - II

Q5) How is Quality related to Productivity, cost, cycle time and value? **[12]**

Q6) State two quality dimensions. What are the ways to motivate for quality as per Maslow's theory? **[14]**

Q7) What criteria must be met while setting operational goal? Highlight advantages of statistical process control. **[14]**

Q8) While developing quality culture, why is it necessary to provide evidence of management leadership? Explain the concept of Error-Proofing the process. **[14]**

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Total No. of Questions : 8] **SEAT No. :**

P3592 **[Total No. of Pages : 2**

[4750]-32

M. Pharmacy (Semester - I & II)

ACTIVE PHARMACEUTICAL INGREDIENTS (APIS)

Manufacturing Technology

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q. no. 1 and 5 are compulsory. Out of remaining questions solve any two questions from Section - I and any two questions from Section - II.***
2) ***Section - I and Section - II should be answered in separate Answer books.***
3) ***Draw well labeled diagrams wherever necessary.***

SECTION - I

Q1) Give an account of manufacturing technology by Alkylation and Hydrolysis process. [**12**]

Q2) Write detail account of manufacturing methods, flow charts for Benzocaine and Aspirin. [**14**]

Q3) Give an account of Unit process in synthesis. Discuss about fine chemicals in industry. [**14**]

Q4) Write short note on. (Any Two) [**14**]

a) Heavy chemicals

b) Nitration

c) Biochemical process in synthesis

P.T.O.

SECTION - II

Q5) Write an account of Industrial noise, noise measuring equipments. [**12**]

Q6) Give an account of forms of Atmospheric contaminants in manufacturing industry. [**14**]

Q7) Write detail account of Radiation hazards in manufacturing unit. [**14**]

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

a) Flow chart for Rifampicin

b) Industrial centrifuges.

c) Chemical mixtures.

Total No. of Questions : 8] **SEAT No. :**

P3593 **[Total No. of Pages : 2**

[4750]-33

M. Pharmacy (Semester - I & II)

SAFETY PHARMACOLOGY

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q. no. 1 and 5 are compulsory. Out of remaining attempt any 2 questions from section - I & 2 questions from section - II***

2) ***Separate answer book should be used for separate sections.***

3) ***Figures to right indicate full marks.***

SECTION - I

Q1) Explain the new drug safety assessment as per ICH guidelines. [**10**]

Q2) Discuss in details various in vitro? In vivo studies for genotoxicity. [**15**]

Q3) Write the importance and study design for repeat dose toxicity. [**15**]

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

a) Risk benefit assessment in clinical trials.

b) Periodic safety update reports (PSUR)

P.T.O.

SECTION - II

Q5) Discuss the Importance, scope and principles of safety pharmacology. [**10**]

Q6) Define pharmacovigilance. Write the process of collection and reperting of pharmacovigilance data. [**15**]

Q7) Discuss in detail the study design and importance of carcinogenicity. [**15**]

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

a) Ocular toxicity testing.

b) Analysis of safety pharmacological data.

Total No. of Questions : 8] **SEAT No. :**

P3594 **[Total No. of Pages : 2**

[4750]-34

M. Pharmacy (Semester - I & II)

CHEMISTRY OF MEDICINAL NATURAL PRODUCTS

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q. no. 1 and 5 are compulsory. Out of remaining solve any two from section I and any two from section II.***
2) ***Answers to the two sections should be written on separate answer books.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Write the biogenetic pathway for Tryptophan and Tyrosine derived alkaloids. [**10**]

Q2) Describe chemistry of Saponin glycosides and isolation of Glycerhizin. [**15**]

Q3) Focus on spectral data to explain structure of Caffin. [**15**]

Q4) Write short note on. (Any Two) [**15**]

a) Secondary metabolites

b) Analytical methods for Atropine.

c) Cardiac glycosides.

P.T.O.

SECTION - II

Q5) Explain the structure of Diosgenine by spectral study. [**10**]

Q6) Define and classify flavonoids. Add note on Anthocyanins. [**15**]

Q7) Classify terpenoids. Explain methods of extraction of essential oils. [**15**]

Q8) Write short note on (Any two) [**15**]

a) Plant pigments

b) Monosacharides

c) Oleogum resins.

Total No. of Questions : 8] **SEAT No. :**

P3595 **[Total No. of Pages : 1**

[4750]-35

M. Pharmacy (Semester - I)

NATURAL PRODUCT MANAGEMENT

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q. No. 1 and 5 are compulsory. Out of remaining solve any two from section I and any two from section II.***
2) ***Answers to the two sections should be written on separate answer books.***
3) ***Figures to the right indicate full marks.***

SECTION I

Q1) Describe the relationship between demand and supply of material in market. **[10]**

Q2) Explain management of crop using Land, Labour and Machine. **[15]**

Q3) Write a detail note on various plans by Indian Government for development of medicinal plants. **[15]**

Q4) Explain in detail the essential factors for cultivation of preoritize medicinal plants in India. **[15]**

SECTION II

Q5) Explain the legal method for trading of herbal cosmetics in and across the country. **[10]**

Q6) Describe in detail the procedure for patenting herbal products. **[15]**

Q7) Brief on design and development of herbal extraction unit. **[15]**

Q8) Write a detail note on trading of Nutraceuticals in international market. **[15]**

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Total No. of Questions : 8]

SEAT No. :

P3596

[Total No. of Pages : 2

[4750] - 36

M. Pharmacy (Semester - I)

CLINICAL TRIALS

(2008 Pattern)

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

Instructions to the candidates:

1) ***Question No.1 and 5 are compulsory. Solve any two questions from the remaining in section I and section II.***
2) ***Write answers for section - I and section - II in separate answer sheets.***
3) ***Figures to the right indicate full marks.***
4) ***Draw well labeled diagrams wherever necessary.***

SECTION - I

Q1) Discuss various steps involved in clinical trial design. **[10]**

Q2) Justify role of informed consent and institutional review board in ethical conduct of clinical trials. **[15]**

Q3) What is new drug development process? Explain in detail different phases of clinical trials. **[15]**

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

a) Role of FDA in clinical trial.

b) Types of clinical research.

c) Advantages and disadvantages of clinical trial designs.

P.T.O

SECTION - II

Q5) Discuss Clinical trial protocol. **[10]**

Q6) Explain role and responsibility of various stakeholders of clinical trials. **[15]**

Q7) Explain concept and importance of Therapeutic drug monitoring. **[15]**

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

a) Case report forms.

b) ICH-GCP guidelines.

c) Laboratory certification.

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Total No. of Questions : 6]

SEAT No. :

P3597

[Total No. of Pages : 1

[4750] - 37

M. Pharmacy (Semester - I)

PHARMACEUTICAL PLANT DESIGN AND OPERATIONS

(2008 Pattern)

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

Instructions to the candidates:

1) ***Answer 2 questions from Section - 1 and 2 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) Discuss the design, layout and operational facilities for Liquid orals. **[20]**

Q2) Discuss the design, layout and operational facilities for Capsule. **[20]**

Q3) Discuss in detail regulatory requirements of Pharma facilities with reference to cGMP. **[20]**

SECTION - II

Q4) What is effluent ? Write importance of effluent treatment plant. Explain in detail its design. **[20]**

Q5) Explain design of pharmaceutical plant support services. **[20]**

Q6) Explain design of water stream and compressed air as utility services. **[20]**

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Total No. of Questions : 10]

SEAT No. : [ ]

P3598

[Total No. of Pages : 2

[4750] - 38

M. Pharm.

MEDICINAL PLANT BIOTECHNOLOGY

(2008 Pattern)

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

Instructions to the candidates:

1) ***This question paper consist of two sections; Section - I and Section - II.***
2) ***Use two separate answer books for the Section - I & Section -II.***
3) ***Solve any four questions from section I & Solve any four questions from section II***
4) ***Enter the question number clearly in the margin of the answer book beside each of your answer.***
5) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) What is *Agrobacterium tumefaciens* ?

b) Write down principle involved in the *agrobacterium tumefaciens* gene transfer to plant cell. **[10]**

Q2) What is Somatic embryogenesis ? What are its applications ? What are different steps required in plant regeneration via somatic embryogenesis ? Enlist the Problems associated with somatic embryogenesis. **[10]**

Q3) What is an 'Endemic Species' ? What is paleoendemism and neoendemism ? What is the meaning of *Ex-situ* conservation?

What is the meaning of *In-situ* conservation ?What are benefits of *in-situ* conservation ? **[10]**

P.T.O.

Q4) Chloroplasts have their own DNA, often abbreviated as ctDNA, or cpDNA. Briefly explain Molecular structure of ctDNA, or cpDNA.

What is the translocon on the outer chloroplast membrane (TOC) & The translocon on the inner chloroplast membrane (TIC) ? **[10]**

Q5) Write short notes on (any two): **[10]**

a) Polyploidy

b) Classification of Elicitors for Production of Secondary metabolites

c) Micro RNA

d) A Mutation & Induced Mutation

SECTION - II

Q6) What are Genetically modified crops (GMCs, GM crops, or biotech crops)? Write down Applications of Transgenic Plants. **[10]**

Q7) What is an Immobilized Enzyme ? What are its commercial uses ? What are different ways by which one can immobilize an enzyme. **[10]**

Q8) What are restriction enzymes ? What are its types ? **[10]**

Q9) What are Plasmids ? Write a breif note on Plasmid as vectors. What is Horizontal & Vertical gene transfer mechanism ? **[10]**

Q10) Write short note on (any two): **[10]**

a) Edible vaccines: current status and future.

b) Advances in Plant Chromosome Analysis.

c) Papain.

d) Bromelain.

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Total No. of Questions : 6] **SEAT No. :**

P3599 **[Total No. of Pages :2**

[4750]-39
M.Pharmacy (Semester - I)
QUALITY CONTROL AND ASSURANCE OF PHARMACEUTICALS
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question number 1 and 4 are compulsory. Out of remaining solve any one question from section - I and section - II.***
2) ***Answer to the two sections should be written in separate answer book.***
3) ***Draw well labeled diagrams wherever necessary.***

SECTION - I

Q1) Highlight various aspects of user requirement specification, design, size, construction and maintenance of dry powder mixer. **[20]**

Q2) a) Discuss the sources of contamination in sterile formulations and methods followed to control the contamination. **[10]**

b) Describe various aspects of self inspection. **[10]**

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

a) Master validation plan and calibration

b) Provide contents of typical Batch packaging record

P.T.O.

SECTION - II

Q4) Provide typical MPCR for enteric coated tablet formulation. **[20]**

Q5) a) Provide SOP on "Product Recall" and formats required to comply the procedure as per GMP. **[10]**

b) Describe in detail quality manual by typical pharmaceutical organisation. **[10]**

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

a) IPQC in manufacturing of sterile dosage forms and QA relevance

b) Returned goods and waste materials management-Documentation and Role of QA

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