Total No. of Questions : 06]

SEAT No. :

P4655

[Total No. of Pages : 2

[4950] - 1

M.Pharmacy

ADVANCED ANALYTICAL TECHNIQUES

(2008 Pattern) (Semester-I)

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

Instructions to the candidates:

1) ***Question number 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 well labeled diagrams wherever necessary.***
5) ***Figures to the right indicate full marks.***

SECTION-I

Q1) a) Elucidate the structure of compound from following data. **[8]**

Mol wt = 150, UV = $\lambda \max 274nm, \varepsilon_{max} 2050$

IR = 3031, 2941, 1725, 1608, 1504, 1060, 830 cm^{-1}

NMR = $\delta 2.35$(singlet, 3H), $\delta 3.82$(singlet, 3H), $\delta 7.85$(4H)

b) Write about theory, principle and instrumentation of UV spectroscopy. **[8]**

c) Discuss Mc Lafferty rearrangement. **[4]**

Q2) a) Write about principle, instrumentation and application of HPTLC **[8]**

b) Give detail account of principle, instrumentation and applications of atomic emission spectroscopy. **[8]**

c) Write note on Hyphenated techniques in analysis **[4]**

Q3) a) Write principle and application of super critical fluid chromatography. **[8]**

b) Write principle and instrumentation of mass spectrometer **[8]**

c) Write note on spin-spin coupling **[4]**

P.T.O.

SECTION-II

Q4) a) Write principle, instrumentation, and application of TGA. **[10]**

b) Describe about factors affecting chemical shift. **[10]**

Q5) a) Write an account of x-ray diffraction technique. **[10]**

b) ICH guidelines for validation of analytical methods. **[10]**

Q6) a) Write detail account of pumps used in HPLC. **[10]**

b) Discuss theory and applications of differential scanning calorimetry. **[10]**

Total No. of Questions : 08]

SEAT No. :

P4664

[Total No. of Pages : 2

[4950] - 10

M.Pharmacy

BIOPHARMACEUTICS AND PHARMACOKINETICS

(2008 Pattern) (Semester-I & II)

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

Instructions to the candidates:

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

SECTION - I

Q1) Describe various dissolution testing apparatus as per USP. With respect to Noye's Whitney Equation explain the film theory. **[10]**

Q2) Describe the regulatory aspects with respect to bioavailability and bioequivalence testing for conventional dosage forms. How does it differ for controlled drug delivery systems? **[15]**

Q3) Explain absolute and relative bioavailability. Discuss various methods to determine area under the curve. **[15]**

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

a) Concept of steady state concentration

b) ABC Transporters

c) In vitro and in vivo models for prediction of absorption

P.T.O.

SECTION - II

Q5) What is dose dependent pharmacokinetics? Describe any one method to determine V_{max} and K_m. **[10]**

Q6) What are various pharmacokinetic models? Describe their prominent characteristics. Define the various pharmacokinetic parameters that can be determined by these models. **[15]**

Q7) Enlist the methods of determining absorption rate constant (Ka). Explain any one method for determination of Ka. Also give the merits and demerits of each. **[15]**

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

a) Protein binding

b) Dose individualization

c) Causes and detection of non-linearity in pharmacokinetics

Total No. of Questions : 08]

SEAT No. :

P4665

[Total No. of Pages : 2

[4950] - 11

M.Pharmacy (Semester-I & II)

STERILE PRODUCTS FORMULATION AND TECHNOLOGY

(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) ***Answer to the two sections should be written in separate answer books.***
3) ***Draw a neat and labeled diagrams wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain in detail preformulation study for the parenteral drug delivery. **[12]**

Q2) Explain in detail formulation and manufacturing of dried forms of SVP's. **[14]**

Q3) What are niosomes? Explain in detail manufacturing technology and applications of niosome in injectable drug delivery. **[14]**

Q4) Write a short note on (any two) **[14]**

a) Particulate and liposomal delivery of ophthalmic use.

b) Implantable drug delivery.

c) Excipient compatibility study during preformulation of parenteral product.

P.T.O.

SECTION - II

Q5) Explain components of HEPA filter. Write a note on mechanism of filtration. **[12]**

Q6) Write a note on process selection and specification for sterilization of parenterals. **[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) Hazards and complications associated with parenteral therapy

b) AHU unit

c) BFS and FFS technology

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Total No. of Questions : 08]

SEAT No. :

P4666

[Total No. of Pages : 1

[4950] - 12

M.Pharmacy (Semester-I & II)

CHEMISTRY OF MEDICINAL NATURAL PRODUCTS

(2008 Pattern)

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

Instructions to the candidates:

1) ***Question 1 and 5 are compulsory. Out of the remaining solve any two from section-I and any two from section-II.***
2) ***Answer to the two sections should be written on separate answer books.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Define secondary metabolites. Explain their roll in plants and animals. **[10]**

Q2) Define the classify carbohydrates. Give methods for preparation of Maize and wheat starch. **[15]**

Q3) Elucidate the spectral data for structure of Reserpine. **[15]**

Q4) Define and classify Terpenoids. Describe isolation of Euginol from Clove. **[15]**

SECTION - II

Q5) Write down properties and chemistry of Steroids. **[10]**

Q6) Describe in detail the physicochemical properties and roll of flavonoids in plants and animals. **[15]**

Q7) Write in detail various methods of extraction of volatile oils. **[15]**

Q8) Write an elaborative note on Anthocyanines. **[15]**

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Total No. of Questions : 08]

SEAT No. :

P4667

[Total No. of Pages : 2

[4950] - 13

M.Pharmacy

ACTIVE PHARMACEUTICAL INGREDIENTS (APIS) MANUFACTURING TECHNOLOGY

(2008 Pattern) (Semester-I & II)

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

Instructions to the candidates:

1) ***Question 1 and 5 are compulsory, remaining any two questions to be answewred in section-I and 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) Discuss in detail about technology involved in manufacturing of pharmaceuticals. **[12]**

Q2) Give a detail account of manufacturing methods, flow charts for Rifampicin and Bezocaine **[14]**

Q3) Write an account of biochemical processes in the manufacturing of API **[14]**

Q4) Write short notes on (any two) **[14]**

a) Amination

b) Nitration

c) Esterification

P.T.O.

SECTION - II

Q5) Discuss about foot and leg protection law. Give an account of environmental protection laws in industry. **[12]**

Q6) Write in detail about radiation hazards, radiation detection and measurements. **[14]**

Q7) Give an account of noise, vibration and effect of sound and ultrasound in manufacturing industry. **[14]**

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

a) Finger and arm protection law

b) Chemical mixtures

c) Forms of atmospheric contaminants

Total No. of Questions : 08]

SEAT No. :

P4668

[Total No. of Pages : 2

[4950] - 14

M.Pharmacy (Semester-I & II)

CLINICAL TRIALS

(2008 Pattern)

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

Instructions to the candidates:

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

SECTION - I

Q1) Explain the principles of ICH-GCP guidelines. **[10]**

Q2) Explain new drug development process and discuss in brief various phases of clinical trials. **[15]**

Q3) Discuss in brief the role and responsibilities of various stakeholders in clinical trials. **[15]**

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

a) Bioavailability and Bioequivalance.

b) Process of patient-recruitment in clinical trials

c) Case report form.

P.T.O.

SECTION - II

Q5) Discuss the ethical consideration in clinical trials with reference to nureuvberg code and declaration of Helsinki. **[10]**

Q6) Explain various design of clinical trials with their advantages and disadvantages. **[15]**

Q7) Explain in details parts and contents of IND, NDA and ANDA. **[15]**

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

a) Quality control in clinical trials

b) Schedule 'Y'

c) Informed consent

Total No. of Questions : 08]

SEAT No. :

P4669

[Total No. of Pages : 2

[4950] - 15

M.Pharmacy (Semester-I & II)

SAFETY PHARMACOLOGY

(2008 Pattern)

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

Instructions to the candidates:

1) ***Question 1 and 5 are compulsory. Attempt any 2 questions from section-I and 2 questions from section-II.***
2) ***Separate answer book should be used separate sections.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Define safety pharmacology? Discuss the principles, scope and importance of safety pharmacology. **[10]**

Q2) Define carcinogenicity and explain various studies for carcinogenicity testing. **[15]**

Q3) Explain reproductive toxicity study in brief. **[15]**

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

a) Analysis of safety pharmacological data

b) Ocular toxicity testing

SECTION - II

Q5) Define mutagenicity and write in details about various studies for mutagenicity testing. **[10]**

Q6) Discuss the different methods for the safety assessment of dermatological products. **[15]**

P.T.O.

Q7) Explain the new drug safety assessment as per ICH guidelines **[15]**

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

a) Periodic safety update reports (PSUR)

b) Reporting of adverse events in clinical trials.

Total No. of Questions : 08]

SEAT No. :

P4670

[Total No. of Pages : 2

[4950] - 16

M.Pharmacy

TRADITIONAL SYSTEM OF MEDICINE AND AYURVEDIC FORMULATIONS

(2008 Pattern) (Semester-I)

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

Instructions to the candidates:

1) ***Question 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) ***Answer to the two sections should be written in separate books.***
4) ***Figures to the 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.

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 note (any three) **[15]**

a) Churna

b) Taila

c) Lepa and Kvatha

d) Ghruta

Total No. of Questions : 08]

SEAT No. :

P4671

[Total No. of Pages : 1

[4950] - 17

M.Pharmacy (Semester-I)

NATURAL PRODUCT MANAGEMENT

(2008 Pattern)

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

Instructions to the candidates:

1) ***Question 1 and 5 are compulsory. Out of remaining solve any two from section-I and any two from section-II.***
2) ***Answer to the two sections should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Discuss on development of enteprunership in medicinal plant farming. **[10]**

Q2) Describe various methods to obtain oil from oil seeds. **[15]**

Q3) Write on trading of preoritized medicinal species across the country. **[15]**

Q4) Explain the required structure, equipment and instruments in herbal extraction unit. **[15]**

SECTION - II

Q5) Explain about trading of phytoconsituents in national and international market. **[10]**

Q6) Highlight on Indian government policies for development of medicinal plant farming. **[15]**

Q7) Write a detail note on obtain patent of natural products. **[15]**

Q8) Focus on export and import of natural medicines and food suppliments. **[15]**

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Total No. of Questions : 10]

SEAT No. :

P4672

[Total No. of Pages : 2

[4950] - 18

M.Pharmacy

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) What is the Recombinant DNA molecule? Why it is called as called 'chimeric DNA? How recombinant DNA molecule is created by molecular cloning? How does molecular cloning which is the laboratory process used to create recombinant DNA differ from another process called polymerase chain reaction? Write a note on "Gibson assembly" as a "DNA assembly method". **[10]**

Q2) What is gene expression? What are different types of mechanisms of gene expression? What are different experimental techniques used to measure gene expression? What is RT-PCR? Write its principle in brief. **[10]**

Q3) What is an 'Endemic Species'? What is paleoendemism and neoendemism? What is an endangered species & Threatened species? What is the meaning of *Ex-situ* conservation? What are the drawbacks of *Ex-situ* conservation? **[10]**

Q4) What is a Polyploidy? Write examples of Polyploidy. What is the distinction between the process of aneuploidy and process of polyploidy? **[10]**

P.T.O.

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

a) Protoplast & uses of Protoplast

b) Classification of Elicitors for production of secondary metabolites

c) Hairy root culture & its advantages

d) "Gibson assembly"-A "DNA assembly method" for the joining of multiple DNA fragments in a single, isothermal reaction.

SECTION-II

Q6) Write an exhaustive note on *Agrobacterium*. What is 'Ri plasmids'? **[10]**

Q7) Describe the technique of restriction Fragment Length Polymorphism, that exploits variations in DNA sequences. **[10]**

OR

Write detail note on molecular markers.

Q8) What is an Immobilized Enzyme? What are its commercial uses? What are different ways by which one can immobilize an enzyme. **[10]**

Q9) Give an account of an enzyme reactor. **[10]**

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

a) Edible vaccines: current status and future

b) Electroporation: A method of Gene Transfer in Plants

c) Papain

d) Nucleic acid hybridization

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Total No. of Questions : 06]

SEAT No. :

P4656

[Total No. of Pages : 1

[4950] - 2

M.Pharmacy

RESEARCH METHODOLOGY

(2008 Pattern) (Semester-I)

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

Instructions to the candidates:

1) *Attempt any two questions from section-I and any two questions from section-II.*
2) *Answers to the two sections should be written on separate answer books.*

SECTION - I

Q1) Give objective of research, enlist different types of research and differentiate between basic and patent oriented research. **[20]**

Q2) Explain preparation of project proposal and the cost analysis of project. **[20]**

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

a) Research funding by AICTE

b) Uses of computer packages in documentation

c) Limitation and sources of error in data analysis

SECTION - II

Q4) Explain different parts of research paper and thesis writing in detail. **[20]**

Q5) Describe the role of industry institute interaction in research. **[20]**

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

a) Status of intellectual property rights in India

b) Skill required for oral presentation

c) ANOVA

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Total No. of Questions : 08]

SEAT No. :

P4673

[Total No. of Pages : 2

[4950] - 21

M.Pharmacy (Semester-II)

DRUG REGULATORY AFFAIRS

(2008 Pattern)

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

Instructions to the candidates:

1) ***Question 1 and 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 provisions of the act regarding labeling of drugs and medicines. **[10]**

Q2) a) Write the qualification and duties of Drug Inspector. **[8]**

b) Explain the provisions related to the Pollution Control Act. **[7]**

Q3) Write in detail about Narcotic & Psychotropic Substances Act 1985. **[15]**

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

a) Loan licenses of pharmaceuticals

b) Drug master file

c) Drug Price Control Order 1995

d) Indian Patent Act 1970

P.T.O.

SECTION - II

Q5) Explain different sections of NDA **[10]**

Q6) Explain the WHO requirements related to premises, sanitation & hygiene in pharmaceutical plant **[15]**

Q7) Write the constitution and composition of the Central Pharmacy Council, also state the registration procedure of pharmacist. **[15]**

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

a) Indian Pharmacopeia

b) Consumer Protection Act

c) Good Clinical Practices

d) ISO

Total No. of Questions : 8]

SEAT No. :

P4674

[Total No. of Pages : 2

[4950] - 22

M.Pharmacy

FORMULATIONS AND DEVELOPMENT

(2008 Pattern) (Semester-II)

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 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 formulation. **[12]**

Q2) Explain the concept of pulsatile 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) Mouth dissolving tablet.

b) Excipients used for Gastro retentive drug delivery systems.

c) Self emulsified drug delivery systems.

P.T.O.

SECTION-II

Q5) Explain in detail on metered dose inhalers. Add note on aerosol valve. **[12]**

Q6) Discuss in detail generation and significance of Nanopharmaceuticals. **[14]**

Q7) Discuss need and problems in veterinary dosage forms. Explain formulation strategy to administer veterinary dosage forms via drinking water. **[14]**

Q8) Write notes on any two **[14]**

a) Semisolid based on Niosomes

b) Emulgels

c) Propellents

✦ ✦ ✦ ✦

Total No. of Questions : 6]

SEAT No. :

P4675

[Total No. of Pages : 2

[4950] - 23

M.Pharmacy

(Spl. Pharmaceutics)

NOVEL DRUG DELIVERY SYSTEMS

(2008 Pattern) (Semester - II)

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 must be written in separate answer books.***

SECTION - I

Q1) Explain the need for gastric retentive drug delivery with detailed account of various formulation principles used. **[20]**

Q2) a) Give an account of implantable drug delivery systems. **[10]**

b) Illustrate various invitro methods for evaluating mucoadhesive drug delivery. **[10]**

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

a) Pulsatile drug delivery

b) Biodegradable microspheres

c) Osmotic drug delivery system.

SECTION - II

Q4) a) Describe evaluation procedures for colon targeted drug delivery. **[10]**

b) Influence of drug properties on design of sustained release delivery system. **[10]**

P.T.O.

Q5) Define active and passive targeting. Explain use of monoclonal antibodies in drug targeting. **[20]**

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

a) Ocular controlled drug delivery.

b) Evaluation of transdermal drug delivery.

c) Analysis of protein drugs.

Total No. of Questions : 6]

SEAT No. :

P4676

[Total No. of Pages : 2

[4950] - 24

M.Pharmacy (Semester - II)

(Pharmaceutical Chemistry)

ADVANCED MEDICINAL 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) Explain the role of microorganisms in biotransformation of steroids with suitable examples. **[15]**

b) Write note on receptor cloning. **[5]**

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

b) Write a note on QSAR. **[5]**

Q3) a) Write a brief note on Gene therapy. **[10]**

b) Explain different aspects in combinatorial chemistry. **[10]**

SECTION - II

Q4) a) Draw synthesis scheme with detail mechanism of Diazepam. **[10]**

b) Explain supporters and linkers in combinatorial chemistry. **[10]**

P.T.O.

Q5) Write synthetic routes giving detail mechanism of following drugs describing reaction conditions : (any two) **[20]**

a) Fexofenadine

b) Gefitinib.

c) Diphenhydramine

d) Ethinyl estradiol.

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

a) Histamine receptors.

b) Enzyme immobilization.

c) CADD.

✦ ✦ ✦ ✦

Total No. of Questions : 06]

SEAT No. :

P4677

[Total No. of Pages : 2

[4950] - 25

M.Pharmacy

(Spl. Pharmaceutical Chemistry) (Semester - II)

DRUG DESIGN

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q.No. 1 and Q.No. 4 are compulsory.***
2) ***Answer any one question from section-I and any one question from section-II from the remaining***
3) ***Answers to the two sections should be written on separate books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) What are prodrugs? Explain in brief about designing of drug molecule based on metabolism studies with suitable examples. **[15]**

b) Write in short on CoMFA **[5]**

Q2) a) Explain in detail analog approach for drug design with suitable examples. **[10]**

b) Explain in detail significance of A.D.M.E. studies in drug design. **[10]**

Q3) Explain in brief about various approaches of drug design with suitable examples. **[20]**

SECTION-II

Q4) What is QSAR? Give advantages and disadvantages of QSAR. Explain in brief about hantzsch analysis & free wilson analysis. **[20]**

Q5) What is bioisoterism? Give classification of bioisosters. Write in brief applications of bioisosterism in designing of drug molecules. **[20]**

Q6) Write a short note on (any two) **[20]**

a) Drug design based on Enzyme inhibition.

b) Computer Aided Drug Design

c) Three dimensional QSAR

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Total No. of Questions : 6]

SEAT No. :

P4678

[Total No. of Pages : 2

[4950] - 26

M.Pharmacy (Semester - II)

CLINICAL PHARMACOLOGY

(2008 Pattern)

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

Instructions to the candidates:

1) *Answer any two questions from each section.*
2) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Define clinical pharmacology. Describe the different phases of clinical research. Add a note on controlled clinical trials. **[20]**

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

b) Bronchial asthma. **[10]**

Q3) a) Therapeutic utility of ACE inhibitors in hypertension. **[5]**

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

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

d) Elaborate on therapeutic drug monitoring. **[5]**

SECTION - II

Q4) Describe in detail the management of congestive heart failure. **[20]**

Q5) a) Discuss in detail principles of cancer chemotherapy. Add a note on common toxicities of anticancer drugs. **[10]**

b) Elaborate on renal dialysis. Add a note on drug dose adjustment in renal failure. **[10]**

P.T.O.

Q6) a) Therapeutic utility of sodium channel blockers in arrhythmia. **[5]**

b) Liver cirrhosis. **[5]**

c) Clinical practice guidelines for HIV infection. **[5]**

d) Management of peptic ulcer. **[5]**

Total No. of Questions : 6]

SEAT No. :

P4679

[Total No. of Pages : 2

[4950] - 27

M.Pharmacy (Semester - II)

MOLECULAR PHARMACOLOGY

(2008 Pattern)

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

Instructions to the candidates:

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

SECTION - I

Q1) a) Explain potential of human genome mapping in drug research. **[10]**

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

Q2) a) What is adhesion therapy? Explain clinical implication of this therapy. **[10]**

b) Discuss the concept of chronopharmacology with its therapeutic implications. **[10]**

Q3) Write a note on following: **[20]**

a) Chloride channel and it's modulators

b) Neuropeptides

c) Glutamte receptors

d) Purinergic receptors

P.T.O.

SECTION - II

Q4) a) Discuss recent trends on drugs acting on serotonin receptors. **[10]**

b) Write a note on transgenic animals used in experimental pharmacology. **[10]**

Q5) a) What are reactive oxygen intermediates? Add a note on therapeutic implications of Antioxidants. **[10]**

b) Explain the basic concepts of high throughput screening. **[10]**

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

a) Enzyme linked receptors

b) Protein kinases

c) Opiod receptors

d) Cyclic nucleotides

Total No. of Questions : 8]

SEAT No. :

P4680

[Total No. of Pages : 2

[4950] - 28

M.Pharmacy (Semester - II)

PHYTOCHEMISTRY & 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) Explain how solubility pattern plays an important role in extraction of alkaloids. Support your answer by quoting appropriate examples. **[10]**

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

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

i) Digoxin

ii) Ergometrine

Q3) Standardization plays a major role in herbal drug development. Comment with reference to andrograpoholides and Gingerol. **[15]**

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

a) Extraction of Caffeine.

b) Importance of Curcumin in pharma industry.

c) Taxol.

P.T.O.

SECTION - II

Q5) WHO has a major role to play in quality control of herbal drugs. Explain how. Write principle & procedure for determination of pesticide residue**.** **[10]**

Q6) a) Describe the infrastructure requirement of herbal extraction unit. **[7.5]**

b) Write a note on stability and preservation of herbal extracts. **[7.5]**

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

a) Anti-diabetic activity

b) Antioxidant activity

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

a) Evaluation of herbal extracts

b) Hepatoprotective screening

c) Determination of Microbial Load

Total No. of Questions : 8]

SEAT No. :

P4681

[Total No. of Pages : 2

[4950] - 29
M.Pharmacy
(spl. Pharmacognosy) (Semester - II)
INDUSTRIAL PHARMACOGNOSY
(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) Enumerate briefly the scope of medicinal plants in future growth potential of national economy. **[10]**

Q2) Describe the production & utilization of medicinal plants in India. **[15]**

Q3) Explain the export potential of medicinal herbs with suitable examples. **[15]**

Q4) Elaborate the demand and scope for worldwide trade in medicinal plants and derived products. **[15]**

SECTION - II

Q5) Elaborate the infrastructural requirement of industries involved in standardization of extracts. **[10]**

Q6) Explain the global regulatory status of herbal medicine. **[15]**

P.T.O.

Q7) Write briefly the export potential of Indian medicinal plants used in aromatherapy. **[15]**

Q8) Describe production & utilization of medicinal plants and their product in India. **[15]**

Total No. of Questions : 06]

SEAT No. :

P4657

[Total No. of Pages : 1

[4950] - 3
M.Pharmacy
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 section 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) Define preformulation. Explain the concept of solubility and pKa in preformulation studies. **[20]**

Q2) Explain quality control tests for pharmaceutical suspensions. Discuss validation of pharmaceutical process with one case study. **[20]**

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

a) Biodegradable polymers

b) Spray drying

SECTION-II

Q4) Define optimization. Classify and explain the different methods with suitable examples. **[20]**

Q5) What is need of dissolution testing? Explain in detail the different dissolution models. **[20]**

Q6) Discuss in brief the stability testing of drug products as per ICH guidelines. **[20]**

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Total No. of Questions : 6]

SEAT No. :

P4682

[Total No. of Pages : 1

[4950] - 30
M.Pharmacy
(Spl. Quality Assurance Techniques)
PHARMACEUTICAL VALIDATION
(2008 Pattern) (Semester-II)

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

Instructions to the candidates:

1) ***Questions 1 and 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) Define validation. Explain in detail its scope, importance, types and limitations. **[20]**

Q2) a) What is validation master plan, elaborate its contents? **[10]**

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

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

a) Vendor certification

b) Equipment validation of fluidised bed dryer.

SECTION-II

Q4) a) What are the parameters to be monitored during performance verification of UV-Vis spectrophotometer? **[10]**

b) Explain cleaning method validation of an equipment. **[10]**

Q5) Explain validation of HVAC system. **[20]**

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

a) Validation of dissolution test apparatus.

b) Process validation of tablet by wet granulation.

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

P4683 **[Total No. of Pages : 1**

[4950] - 31
M.Pharmacy
QUALITY PLANNING AND ANALYSIS
(2008 Pattern) (Semester-II)

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

Instructions to the candidates:

1) ***Questions No. 1 and 5 are compulsory.***
2) ***Out of the remaining questions solve any two question from each section.***
3) ***Figures to the right indicate full marks.***
4) ***Answers to the two sections should be written in separate answer books.***

SECTION-I

Q1) Discuss "Optimum Quality Cost" **[12]**

Q2) Explain application of Ishikawa "Cause and Effect" Diagram. **[14]**

Q3) Comment on the concept of self Control. **[14]**

Q4) Write notes on **[14]**

a) Maslow's theory

b) Process capability information

SECTION-II

Q5) Discuss error-proofing principles. **[12]**

Q6) Write a note on "Disposition of Non-Conforming product". **[14]**

Q7) Discuss kinds of sampling risks. Add a note on "Operating Characteristics Curve". **[14]**

Q8) State and explain contents of "Audit Report". **[14]**

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Total No. of Questions : 08]

SEAT No. :

P4658

[Total No. of Pages : 2

[4950] - 4

M.Pharmacy

ADVANCED PHARMACEUTICAL CHEMISTRY

(2008 Pattern) (Semester-I)

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

Instructions to the candidates:

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

SECTION-I

Q1) What is pinacole-pinacolone rearrangement, explain along with reaction mechanism, stereochemistry and applications. **[10]**

Q2) What is solid phase synthesis? Explain the mechanism of protection, deprotection and coupling reaction in solid phase synthesis. **[15]**

Q3) What is asymmetric synthesis? Give asymmetric synthesis of Atenolol and Omeprazole. **[15]**

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

a) Allylic Bromination

b) Meerwein-Pondorff reduction

c) Griganard reaction

P.T.O.

SECTION-II

Q5) Explain reduction with metallic hydrides **[10]**

Q6) What is Synthon approach? Give synthetic route for Ciprofloxacin and Terfenadine. **[15]**

Q7) What is green chemistry? Explain reactions using microwave and ultrasound energy. **[15]**

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

a) Role of stereochemistry in Pharmacokinetics and Pharmacodynamics

b) Water as solvent

c) Writing reaction

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Total No. of Questions : 06]

SEAT No. :

P4659

[Total No. of Pages : 1

[4950] - 5
M.Pharmacy
ADVANCED PHARMACOLOGY
(Preclinical Evaluation of Drugs)
(2008 Pattern) (Semester-I)

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

Instructions to the candidates:

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

SECTION I

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

Q2) Discuss the preclinical evaluation of antihypertensives. **[20]**

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

a) High throughput screening

b) Preparation of research protocol as per From B

c) IAEC

SECTION II

Q4) Discuss the preclinical evaluation of antiulcer agents. **[20]**

Q5) Discuss the preclinical evaluation of anti-inflammatory drugs. **[20]**

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

a) Radio ligand binding assay

b) Screening of antitussives

c) ELISA

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Total No. of Questions : 08]

SEAT No. :

P4660

[Total No. of Pages : 2

[4950] - 6

M.Pharmacy

ADVANCED PHARMACOGNOSY

(2008 Pattern) (Semester-I)

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

Instructions to the candidates:

1) ***Question no.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) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION-I

Q1) Enlist various strategies used to enhance secondary metabolite production through tissue culture techniques. Describe biotransformation using plant cell culture. **[10]**

Q2) a) Explain principle and application of chemotexonomy to medical Botany. **[7]**

b) Describe "Terpene" as chemotaxonomic marker with suitable examples. **[8]**

Q3) Explain, how natural products are useful in discovering new drugs? Explain vinca alkaloid as a lead compound in discovering the new drugs. **[15]**

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

a) Bioreactor for production of secondary metabolites.

b) Genetic manipulation for production of secondary metabolites

c) Colouring agent of plant origin

d) Biofuels

P.T.O.

SECTION-II

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

Q6) a) Explain hepatoprotective role of Sylimarin. **[7]**

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

Q7) Write various in vitro and in vivo models used in evaluation of anticancer activity & explain various mechanisms through which phytochemicals mediate anticancer activity. **[15]**

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

a) Flavonoids as anti-diabetic agents.

b) Application of biopolymers as pharmaceutical excipients.

c) Role of High Throughput Screening (HTS) in drug discovery.

d) Photosensitizing agents of natural origin.

Total No. of Questions : 06]

SEAT No. :

P4661

[Total No. of Pages : 2

[4950] - 7

M.Pharmacy

Quality Assurance Techniques

Advanced Quality Assurance Techniques

(2008 Pattern) (Semester-I)

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

Instructions to the candidates:

1) ***Question number 1 and 4 are compulsory. Answer any one question from the remaining form each section.***
2) ***Answers for 2 sections should be written in the separate answer book.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Define Good Manufacturing Practices (GMP). Discuss the regulatory guidelines about GMP. **[20]**

Q2) a) Discuss the regulatory guidelines related to Personnel. **[10]**

b) Define "Change Control". Explain and design a document for Change Control. **[10]**

Q3) a) Discuss the measures for controlling mix-ups and cross contamination during pharmaceutical manufacturing. **[10]**

b) Elaborate Quality Audit. **[10]**

SECTION - II

Q4) Enlist the documents related to materials management in pharmaceutical industry. Elaborate the SOP on receipt and storage of raw materials. **[20]**

P.T.O.

Q5) a) Comment on the designing of the water and steam system for manufacturing of sterile products. **[10]**

b) Elaborate Site Master File. **[10]**

Q6) a) Discuss the site and plant security and safety. **[10]**

b) Discuss the outsourcing of analytical operations. **[10]**

Total No. of Questions : 06]

SEAT No. :

P4662

[Total No. of Pages : 2

[4950] - 8

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 one and four are compulsory. Out of remaining solve any one question form section I and section II.***
2) ***Answer to the two sections should be written in separate answer book.***
3) ***Drawn well labeled diagrams wherever necessary.***

SECTION - I

Q1) What is the importance of process validation? Describe process validation methods. **[20]**

Q2) a) Describe validation of environmental control system used for sterile filling area. **[10]**

b) What is quality assurance audit? Provide audit questionnaire for QC and Engineering dept. **[10]**

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

a) Chromatographic System suitability tests and its importance in analytical method validation.

b) Sterile area environmental monitoring documents.

SECTION - II

Q4) Give an account of guidelines for design and implementation of pharmaceutical manufacturing documentation (PMD) programmes and provides RM specification documents. **[20]**

P.T.O.

Q5) a) Describe in details job description of production supervisor, Describe Granulation area cleaning SOPs and provide Granulation area cleaning document. **[10]**

b) Describe in detail QA aspects of processing and documentation in relation to recalled, intermediate and bulk products. **[10]**

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

a) Provide contents of typical site master file.

b) Explain in detail role of QA in returned goods and waste materials management.

Total No. of Questions : 06]

SEAT No. :

P4663

[Total No. of Pages : 1

[4950] - 9

M.Pharmacy

PHARMACEUTICAL PLANT DESIGN AND OPERATIONS

(2008 Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***Answer 2 questions from section-I and 2 questions from section-II***
2) ***Answer to the two sections should be written in separate answer book***
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 sterile powder ready for reconstitution. **[20]**

Q2) Explain revised schedule M and factory act. **[20]**

Q3) Discuss the design, layout and operational facilities for tablet. **[20]**

SECTION - II

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

Q5) Explain design of water stream and compressed air as utility services. **[20]**

Q6) Discuss design of pharamaceutical plant support services like security office, scrap yard, garden and horticulture, training centre, administrative block, toilet facilities. **[20]**

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