Total No. of Questions : 6] **[Total No. of Pages :2**

P 1671 **[4056] - 101**

M. Pharmacy

ADVANCED ANALYTICAL TECHNIQUES

(2008 Pattern) (Sem. - I)

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

Instructions to candidates :

1) ***Question 1 and 4 are Compulsory.***
2) ***Attempt any one question from the remaining in section I and any one question from the remaining questions of section II.***
3) ***Answers 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) Suggest suitable chemical structural formula for following spectroscopic data: **[8]**

MF $C_5H_{12}O$

Transparent to UV

IR : 3480, 2970, 1150 cm^{-1}

Proton NMR:

0.9 triplet 3H

1.14 singlet 6H

1.48 quartet 2H

3.2 singlet 1H

b) Explain instrumentation and applications of powder X-ray diffraction. **[8]**

c) Comment on energy transitions in NMR spectroscopy. **[4]**

Q2) a) Discuss various energy transitions in a molecule after absorption of UV radiations with suitable example. **[8]**

b) Write theory, instrumentation and applications of Differential Scanning Calorimetry. **[8]**

c) Comment on carbonyl IR absorption peak in acetaldehyde and acetone. **[4]**

P.T.O.

Q3) a) What is emission spectroscopy? Discuss principle and applications of fluorescence, phosphorescence and chemiluminescences. **[8]**

b) Explain interpretation of IR spectrum and fingerprint region in IR spectroscopy. **[8]**

c) Calculate absorption maxima of 4-chloro-2-methyl benzoic acid and 4-chloro-2-methyl benzaldehyde. **[4]**

SECTION-II

Q4) a) Compare & contrast different aspects of TLC and HPTLC techniques. **[10]**

b) Elaborate on API mass spectral technique. Explain how fragmentation takes place in CIMS. **[10]**

Q5) a) What is a stability indicating HPLC method of analysis? Explain in detail how it is validated as per ICH guidelines? **[14]**

b) Elaborate on what is "head space GC"? Give two important applications of the same in analysis. **[6]**

Q6) a) Explain in depth which parameters are considered important in selecting a HPLC UV detector. **[8]**

b) Illustrate with the help of fragmentation how 1-pentanol, 2-pentanol, and 2-methy1-2-butanol can be identified with the help of EIMS.**[12]**

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Total No. of Questions : 6] **[Total No. of Pages :1**

P 1672 **[4056] - 102**

M. Pharmacy (Sem. - I)

RESEARCH METHODOLOGY

(2008 Pattern)

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

Instructions to 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 in separate answer books.***
3) ***All questions carry equal marks.***

SECTION-I

Q1) What is research? Discuss in detail the different types of research. **[20]**

Q2) Discuss the different sources of research problems. Explain the importance of selection and formulation of research problem. **[20]**

Q3) Write notes on any two of the following: **[20]**

a) Use of computer packages in documentation.

b) Student't' test.

c) Correlation data.

SECTION-II

Q4) Give the detailed account of data analysis techniques employed in scientific research. **[20]**

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) Use of bibliography in research.

b) Importance of literature survey in research.

c) ANOVA.

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Total No. of Questions : 6] **[Total No. of Pages :1**

P 1673 **[4056] - 103**

M. Pharmacy

ADVANCED PHARMACEUTICS

(2008 Pattern) (Sem. - I)

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

Instructions to candidates :

1) ***Answer 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) What is Preformulation? Give its significance and discuss physics of tablet Compression. **[20]**

Q2) Explain in detail characterization of polymers. **[20]**

Q3) Explain concept of Stability of pharmaceuticals & discuss in detail statistical aspects in expiry period. **[20]**

SECTION-II

Q4) Explain the concept of quality control, quality assurance and total quality management and discuss validation of pharmaceutical process with at least one case study. **[20]**

Q5) Discuss the methods, formulation and evaluation of microcapsules. **[20]**

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

a) Dissolution models.

b) Biodegradable Polymers.

c) Liquid crystal phase.

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Total No. of Questions : 8] **[Total No. of Pages :1**

P 1674 **[4056] - 104**

M. Pharmacy (Sem. - I)

ADVANCED PHARMACEUTICAL CHEMISTRY

(2008 Pattern)

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

Instruction to the candidates :

Question Nos. 01 and 05 are Compulsory. Out of the remaining attempt 2 questions from Section I and 2 questions from Section II.

SECTION-I

Q1) Explain conformational isomerism with examples. **[10]**

Q2) What are chiral drugs? Explain asymmetric synthesis of Nifedipine. **[15]**

Q3) Explain wittig reaction along with reaction mechanism, stereochemistry and application. **[15]**

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

a) Ionic liquids.

b) Solvent free reactions using microwave technology.

c) Free radical reactions.

SECTION-II

Q5) Define synthon. Explain the rules for disconnection of heteroatoms in synthon approach with examples. **[10]**

Q6) Give two methods of asymmetric synthesis. **[15]**

Q7) What are FGI's? Give the synthon approach to the synthesis of Losartan. **[15]**

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

a) Birch reduction.

b) Optical isomerism.

c) Water as solvent.

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Total No. of Questions : 8] **[Total No. of Pages : 2**

P1695

[4056]-208
M. Pharmacy (Sem. - II)
PHYTOCHEMISTRY & PHYTOPHARMACEUTICALS
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question 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 answer books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Describe in detail methods of extraction, isolation, characterization and structure elucidation of Caffeine. **[10]**

Q2) Give the Instrumental identification of following phytoconstitutents **[15]**

a) Rutin
b) Quercetin
c) Vasicine

Q3) Explain in detail the chemistry of Saponins and give the Pharmaceutical profile of Diosgenin. **[15]**

Q4) Write Short notes (Any Two) **[15]**

a) IR spectral analysis of Gingerol and Curcumin.
b) Extraction and isolation of Sennosides.
c) Pharmaceutical significance of Pyrethrin.

SECTION - II

Q5) Explain the principle, procedure, and importance of following parameters in evaluation of Natural products as per WHO guidelines. **[10]**

a) Determination of Arsenic and Heavy metals.
b) Pesticide residue.

Q6) Describe in detail various pharmacological screening methods for evaluation of **[15]**

a) Anti diabetic activity.
b) Anti oxidants

P.T.O.

Q7) Explain in detail the various methods and related equipment for extraction of herbal drugs. **[15]**

Q8) Write Short notes (Any Two) **[15]**

a) Pharmacological screening of Analgesics.

b) Evaluation of Herbal extracts.

c) Determination of Tannin content.

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Total No. of Questions : 8] **[Total No. of Pages : 1**

P1696

[4056]-209
M. Pharmacy (Sem. - 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 books.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Describe in detail the trends in worldwide trade of medicinal plants. **[10]**

Q2) Describe with suitable examples of export potential of medicinal herbs. **[15]**

Q3) Discuss "Herbal Drug Industry - changing scenario". **[15]**

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

a) Essential oil Industry.

b) Utilization of opium

c) Recent amendments applicable for patents of herbal/natural products & processes.

SECTION - II

Q5) Classify plant industry. Add a note on role of Institutions involved in Development of Herbal drug Industry. **[10]**

Q6) Discuss Infra structure of different types of industries involved in production of various dosage forms. **[15]**

Q7) Classify volatile oil Industry. Discuss the role of volatile oil industry in development of Indian trade **[15]**

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

a) Regulatory status of Herbal medicine world wide.

b) Comparision between Indian & International patent law.

c) Export of plants used in aromatherapy.

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Total No. of Questions : 6] **[Total No. of Pages : 1**

P1697

[4056]-210
M. Pharmacy (Sem. - II)
PHARMACEUTICAL VALIDATION
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question No. 1 and 4 are compulsory. Out of the remaining attempt any one question from Section I and II respectively***
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 Validation with respect to its importance, types and components and write short note on validation protocol and validation master plan. **[20]**

Q2) What is significance of Equipment validation? Explain in detail validation of tablet compression machine. **[20]**

Q3) a) Write importance of analytical method validation. Discuss validation parameters with respect to HPLC method. **[10]**

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

SECTION - II

Q4) Write importance of process validation. Explain fish bone diagram and prospective process validation of coated tablet. **[20]**

Q5) a) Explain Validation of cleaning method for Tablet compression machine. **[10]**

b) Discuss validation of integrated line by media fill test. **[10]**

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

a) Vendor certification.

b) Computer system validation.

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Total No. of Questions : 8] **[Total No. of Pages : 1**

P1698

[4056]-211
M. Pharmacy (Sem. - II)
QUALITY PLANNING AND ANALYSIS
(Theory) (2008 Pattern)

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

Instructions to the candidates:

1) ***Question No. 1 and 5 are compulsory.***
2) ***Answer any two questions from section I and any two questions from section II from the remaining.***
3) ***Answers to the two sections should be written on separate answer books.***
4) ***Figures to the write indicate full marks.***

SECTION - I

Q1) Define audit. Where it is to be done? Explain in detail report of an audit taking example from pharma industry. Differentiate between inspection and audit. **[12]**

Q2) Explain the Juran's trilogy of managing the quality. **[14]**

Q3) Describe and justify the relevant importance of planning to maintain & achieve quality in manufacturing activity. **[14]**

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

a) Sporadic & Chronic Quality problems.

b) Devising & structuring Quality audit programme

c) Automated inspection *viz-a-viz* Manual inspection

SECTION - II

Q5) Explain the role of Quality control and Quality assurance in Pharma industry.**[12]**

Q6) Explain the importance of Statistical Process Control and different statistical control charts and where it is to be used? **[14]**

Q7) Explain the term 'Quality Improvement'. What are the different strategies and concepts applied for improving Quality in Pharma industry. **[14]**

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

a) Inspection Planning

b) Quality Culture

c) Sampling Plans

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Total No. of Questions :6] **[Total No. of Pages :1**

P1675

[4056] - 105
M.Pharmacy (Sem. - I)
ADVANCED PHARMACOLOGY - I
(Preclinical Evaluation of Drugs)
(2008 Pattern)

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

Instructions to the candidates:

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

SECTION - I

Q1) Discuss CPCSEA regulations for animal experimentation. Add a note on proforma - B. **[20]**

Q2) Describe various methods for evaluation of Anticonvulsants. **[20]**

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

a) ELISA.
b) Screening of Antithyroid agent.
c) Animal cell lines.
d) Constitution of IAEC.

SECTION - II

Q4) Explain preclinical Screening Methods for analgesics and anti pyretic. **[20]**

Q5) How will you check potential of local anesthetics using laboratory animals? **[20]**

Q6) Justify Ethical requirements set by CPCSEA in preclinical pharmacology. **[20]**

Total No. of Questions :8] **[Total No. of Pages :2**

P1676

[4056] - 106
M.Pharmacy (Sem. - I)
ADVANCED PHARMACOGNOSY - I
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question No. 1 and 5 are compulsory. Out of 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.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Write in details about biotransformation technique for production of secondary metabolites. **[10]**

Q2) a) What are advantage and disadvantage of chemotaxonomy over morphological methods of classification? Write its application. **[8]**

b) Describe the flavanoids as chemotaxonomic markers with suitable examples. **[7]**

Q3) What are the characteristics of natural products that make them an appropriate material in discovering new drugs? Describe the role of Quinine and Cocaine as head compounds in discovering the new drugs. **[15]**

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

a) Coumarins as Photosensitizing agents.

b) Napthoquinone colouring agents.

c) Biodiesel

d) Flavours from naturals sources.

P.T.O.

SECTION - II

Q5) Explain precursor product sequence and sequential analysis techniquies used in the study of plant biosynthesis. **[10]**

Q6) a) Write review on natural anticancer agent. **[8]**

b) Write note on the plants useful in viral hepatitis. **[7]**

Q7) Write various in vitro and in vivo models used in the evaluation of immunomodelating drugs. **[15]**

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

a) Flavanoids as anti-inflamatory agents.

b) Biopolymers.

c) Bioreactor techniques in secondary metabolite.

d) Role of High Throughout Screening (HTS) in drug discoring.

Total No. of Questions :8] **[Total No. of Pages :2**

P1677

[4056] - 108
M.Pharmacy
QUALITY CONTROL & ASSURANCE OF PHARMACEUTICALS
(2008 Pattern) (Commonto Sem. - I and Sem. - II)

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

Instructions to the candidates:

1) ***Question 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) Define the term Quality Assurance & Explain its importance in pharmaceutical industry. **[10]**

Q2) a) What are the GMP guidelines for processing of intermediate & bulk products? **[8]**

b) Discuss regulatory guidelines for personnel working in pharmaceutical industry. **[7]**

Q3) a) Discuss importance of equipment logs with suitable examples. **[8]**

b) Describe in brief about revised schedule M. **[7]**

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

a) Sanitation of manufacturing premises.

b) Significance of I.P.Q.C.

c) Disposal of solid waste material in pharma plant.

P.T.O.

SECTION - II

Q5) What is process validation? Discuss different types of process validation. **[10]**

Q6) a) What is the significance of pharmaceutical manufacturing documentation? Explain in detail Master production & control record. **[8]**

b) Explain the concept of change control in equipment validation. **[7]**

Q7) a) Personnel working in clean rooms are one of the major sources of contamination in clean rooms. If so then what different measures are needed to be taken to minimize this contamination? **[8]**

b) Explain various steps & procedure to exercise self inspection & internal audit of quality control department. **[7]**

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

a) Cleaning validation.

b) Control of mix-ups & cross contamination in parentral manufacturing.

c) International biological standards.

Total No. of Questions : 6] **[Total No. of Pages :1**

P1678

[4056] - 109

M.Pharmacy (Common to Sem. - I & II)

PHARMACEUTICAL PLANT DESIGN & OPERATIONS

(2008 Pattern)

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

Instructions to the candidates:

1) ***Answer any 2 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.***
4) ***Figures to the right indicate full marks.***
5) ***All questions carry equal marks.***

SECTION - I

Q1) Discuss design, layout and operational facilities for liquid orals. **[20]**

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

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

SECTION - II

Q4) Give an account of design of effluent treatment plant. **[20]**

Q5) Explain design and operation of Q.C. Laboratory. **[20]**

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

Total No. of Questions :8] **[Total No. of Pages :2**

P1679

[4056] - 110

M.Pharmacy

BIOPHARMACEUTICS AND PHARMACOKINETICS

(2008 Pattern) (Common To Sem. - I and Sem. - 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) ***Figures to the right indicate full marks.***

SECTION - I

Q1) How dissolution of drug can be improved? Discuss Biopharmaceutical classification system. **[12]**

Q2) Describe various terms used in measurement of bioavailability and discuss factors affecting bioavailability of a drug from dosage form. **[14]**

Q3) Mention various factors affecting drug distribution. Discuss drug related factors like molecular size, ionization and partition coefficient in detail. **[14]**

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

a) In vitro - in vivo correlation.

b) Effect of polymorphism on drug absorption.

c) Pre-systemic drug metabolism.

P.T.O.

SECTION - II

Q5) Define extent of drug availability. Define area under drug plasma concentration - time curve. Discuss various methods to determine Area Under Curve (AUC) **[12]**

Q6) Define clearance, total body clearance and organ clearance. What are advantages of expressing clearance at an individual organ level? **[14]**

Q7) Discuss one compartment open model after oral administration of drug solution. **[14]**

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

a) Protein binding.

b) Dose individualization.

c) Pharmacodynamic parameters.

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Total No. of Questions :8] **[Total No. of Pages :2**

P1680

[4056] - 111

M.Pharmacy

STERILE PRODUCTS FORMULATION AND TECHNOLOGY

(2008 Pattern) (Common To Sem. - I and Sem. - 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.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Describe physiological and formulation parameters in development of Large volume parenterals. **[12]**

Q2) Explain in detail preformulation studies of parenteral medication. **[14]**

Q3) Explain preformulation and formulation development of opthalmic products. **[14]**

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

a) Pharmacopoeial Evaluation of SVP's.

b) Nanoparticles as sustained release formulations.

c) Parenteral Implants.

P.T.O.

SECTION - II

Q5) Explain factors important in utility of sterlization method, give comparision of characteristics of different sterlization methods. **[12]**

Q6) Describe GMP in manufacturing of small volume parenterals. **[14]**

Q7) Give the typical layout of parenteral plant. Explain factors important in site selection. **[14]**

Q8) Write a short note on (any two): **[14]**

a) Hazards associated with parenteral therapy.

b) Parenteral devices.

c) HVAC design.

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Total No. of Questions :8] **[Total No. of Pages :2**

P1681

[4056] - 112

M.Pharmacy

CHEMISTRY OF MEDICINAL NATURAL PRODUCTS

(2008 Pattern) (Common to Sem. - I & Sem. - II)

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

Instructions to the candidates:

1) ***Question no. 1 and 5 are compulsory. Attempt any two questions from remaining for section I and section II each.***
2) ***Answers for two sections should be written in two separate answer books.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Describe the chemistry and structural elucidation of Morphine. **[10]**

Q2) a) Discuss the methods of isolation of essential oil and separation of terpenoids from essential oil. **[8]**

b) Explain the general methods of extraction of alkaloids. **[7]**

Q3) a) Explain the biosynthetic pathway of isoprenoid compounds. **[8]**

b) Describe the structural elucidation of ephedrine. **[7]**

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

a) Biosynthesis of fatty acids.

b) Isolation and purification of glycosides

c) Shikimic acid Pathway.

P.T.O.

SECTION - II

Q5) Discuss in detail the chemistry of plant steroids. **[10]**

Q6) a) Describe the structural elucidation of solasodine. **[8]**

b) Classify flavonoids. Discuss the properties of flavonoids. **[7]**

Q7) a) Explain the general reactions of Mono saccharide. **[8]**

b) Describe the structural elucidation of Atropine. **[7]**

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

a) Chemistry of carotenoids.

b) Chemistry of diosgenin.

c) Chemistry of disaccharides.

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Total No. of Questions :8] **[Total No. of Pages :2**

P1682

[4056] - 113

M.Pharmacy

ACTIVE PHARMACEUTICAL INGRADIENTS (APIS) Manufacturing Technology

(2008 Pattern) (Common to Sem. - I & Sem. - II)

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

Instructions to the candidates:

1) ***Question No. 1 and 5 are compulsory. Remaining any two questions to be answered in section I and section II.***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Diagrams & flow chart for questions set full marks.***

SECTION - I

Q1) Write a note on biochemical processes in synthesis. **[12]**

Q2) Give the industrial manufacturing methods and flow chart of ASPIRIN and BENZOCAINE. **[14]**

Q3) Explain Finger & Arm protection law. **[14]**

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

a) Esterification.

b) Oxidation process.

c) Halogenations.

P.T.O.

SECTION - II

Q5) Write a note on Noise measuring Instruments and effects of sound and ultrasound. **[12]**

Q6) Write a note on Types of Chemical mixtures. **[14]**

Q7) Write a note on control of noise, vibration and Radiation hazards. **[14]**

Q8) Write note on (any two): **[14]**

a) Criteria for Hearing Damage.

b) Types of eyes protection Instruments.

c) Write a law on "foot & leg protection".

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Total No. of Questions : 6] **[Total No. of Pages : 2**

P1691

[4056]-204

M.Pharmacy (Sem. - II)

ADVANCED MEDICINAL CHEMISTRY

(2008 Pattern)

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) *Write answers to section I and Section II in separate answer book.*

SECTION - I

Q1) a) Explain the microbial transformation of steroids with suitable examples. **[15]**

b) Write about supporters and linkers in combinatorial synthesis. **[5]**

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

b) Write nomenclature of prostaglandins. **[5]**

Q3) Write the reaction mechanism and principle involved in following synthesis (Any two): **[20]**

a) Diphenhydramine.
b) Ethinyl estradiol.
c) Linezolide.

SECTION - II

Q4) a) Discuss and compare the advantages and disadvantages of microbial transformation over chemical synthesis. **[15]**

b) Write a brief note on CADD. **[5]**

P.T.O.

Q5) a) Highlight the features of models of cholinergic receptors. **[15]**

b) Write about receptor cloning. **[5]**

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

a) Importance of gene therapy.

b) QSAR in drug design.

c) Enzyme inhibition.

Total No. of Questions : 6] **[Total No. of Pages : 2**

P1692

[4056]-205

M.Pharmacy (Sem. - II)

DRUG DESIGN

(Theory) (2008 Pattern)

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

Instructions to the candidates:

1) ***Question No.1 and 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 in separate answer books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Explain the importance of following in action of drug **[20]**

a) Physicochemical properties

b) Role of stereochemistry

Q2) a) Define the term prodrug. Elaborate various types of prodrugs with suitable examples. **[10]**

b) How is concept of prodrug applicable in drug design. **[10]**

Q3) Discuss the Free Wilson method, its principle, methodology, advantages & disadvantages with suitable examples. **[20]**

SECTION - II

Q4) Explain the concept of Ligand based drug design, methods and techniques involved in the ligand based drug design. **[20]**

Q5) Explain in detail any one of the parameter used in the classical LFER method of QSAR *viz* **lipophilic** or **steric** or **electronic**. **[20]**

P.T.O.

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

a) Energy minimization methods

b) Flexible docking

c) Cluster analysis

d) Molecular mechanics

e) Theory of drug action

f) Template forcing

Total No. of Questions : 8] **[Total No. of Pages : 1**

P1693

[4056]-206
M.Pharmacy (Sem. - II)
CLINICAL PHARMACOLOGY
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question number 1 & 5 are Compulsory. Out of the remaining attempt any two questions from Section - I and two questions from Section - II.***
2) ***Answers to the two sections should be written in separate book.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Discuss the pharmacotherapy of angina pectoris. **[10]**

Q2) Write a detailed note on pharmacotherapy of neoplastic disorders. **[15]**

Q3) Describe the clinical treatment of acute renal failure. Add a note on renal transplantation. **[15]**

Q4) Write notes on:

a) Management of diarrhoea.

b) Pharmacotherapy of peptic ulcers. **[15]**

SECTION - II

Q5) Discuss in detail about the resistance to antibiotics. **[10]**

Q6) Write a note on current concepts in the treatment of AIDS. **[15]**

Q7) Explain the pharmacotherapy of asthma. **[15]**

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

a) Management of hepatic cirrhosis

b) Vaccines and Sera.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P1694

[4056]-207

M.Pharmacy (Sem. - II)

MOLECULAR PHARMACOLOGY

(2008 Pattern)

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

Instructions to the candidates:

1) ***Q.1 & Q.5 are Compulsory.***
2) ***Solve any two questions from the remaining in Section I and Section II.***
3) ***Figures to the right indicate full marks.***
4) ***Write answers for Section I & II in separate answer sheets.***

SECTION - I

Q1) Discuss recent advances in GABA and benzodiazepine receptors research. **[10]**

Q2) Enlist various endogenous bioactive molecules and describe role of endothelium derived vascular substances and it's modulators. **[15]**

Q3) What do you mean by adhesion therapy? Explain clinical implication of this therapy. **[15]**

Q4) Write a note on (any three)

a) Opoid receptors

b) Neuropeptide and it's modulators

c) Pharmacology of atrial peptides

d) Calcium channel modulators **[15]**

P.T.O.

SECTION - II

Q5) Discuss concept of gene therapy and it's use in hereditary diseases. **[10]**

Q6) Explain role of Chronopharmacology in drug therapy. **[15]**

Q7) Write a note on Pharmacological & Clinical implications of apoptosis. **[15]**

Q8) Justify role of human genome mapping in current drug research. **[15]**

Total No. of Questions :6] **[Total No. of Pages :1**

P1701

[4056] - 107
M.Pharmacy (Sem. - I)
ADVANCED QUALITY ASSURANCE TECHNIQUES - I
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question No. 1 and 4 are compulsory.***
2) ***Out of remaining solve any 1 from Section I and any 1 from Section II.***

SECTION - I

Q1) a) Write functions of Q a. **[10]**

b) Enlist Documents in Pharmaceutical Manufacturing. Elaborates Batch Production and control Records. **[10]**

Q2) a) What are the GMP issues with respect to Equipments. **[10]**

b) How to handle rejected, recalled and returned goods. **[10]**

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

a) Surrounding and Building of Pharmaceutical Manufacturing Unit.

b) Quality management system.

SECTION - II

Q4) a) Write principle of quality audit. Give its importance and checklist of Quality Audit. **[10]**

b) How to ensure site and plant security and safety. **[10]**

Q5) a) Explain Quality control, water and steam and HVAC system of Sterile pharmaceutical products. **[10]**

b) Write importance of outsourcing and elaborate manufacturing and packaging outsourcing. **[10]**

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

a) IPQC testing.

b) Site Master file.

Total No. of Questions : 6] **[Total No. of Pages : 1**

P1683

[4056] - 114
M.Pharmacy (Common to Sem. - I & II)
CLINICAL TRIALS
(2008 Course)

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

Instructions to the candidates:

1) ***Solve any two questions from each sections.***
2) ***All questions carry equal marks.***
3) ***Answers to each section shall be written in separate sheet.***

SECTION - I

Q1) Enlist various statistical tests used in clinical trials. Add a note on sub-group analysis. **[20]**

Q2) Enlist various documents of clinical trial protocol. Explain investigators brochure in details. **[20]**

Q3) Justify role of nuremberg code and helsinki declaration in the ethical issues of clinical trials. **[20]**

SECTION - II

Q4) Describe various phases of clinical trials. **[20]**

Q5) Discuss process of NDA and ANDA with examples. **[20]**

Q6) Write about role & responsibilities of stake holders of clinical trials. **[20]**

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Total No. of Questions : 8] **[Total No. of Pages : 1**

P1684

[4056] - 115
M.Pharmacy (Common to Sem. - I & II)
SAFETY PHARMACOLOGY
(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 any 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) Discuss the ICH regulatory guidelines for the new drug safety assessment. **[10]**

Q2) Describe the study design and analysis of safety pharmacological data. **[15]**

Q3) Discuss the principles and study design for acute toxicity studies in rodents. **[15]**

Q4) Write a note on safety testing for dermatological products. **[15]**

SECTION - II

Q5) Write a note on Pharmacovigilance planning. **[10]**

Q6) Write a note on typical design of a carcinogenicity study. **[15]**

Q7) Discuss the safety testing for ocular toxicity study. **[15]**

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

a) Female reproductive toxicity studies.
b) Risk-Benefit assessment of drugs.

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Total No. of Questions : 12] **[Total No. of Pages : 2**

P1685

[4056] - 116
M.Pharmacy
TRADITIONAL SYSTEMS OF MEDICINE & AYURVEDIC FORMULATIONS
(2008 Pattern) (Common to Sem. - I & Sem. - II)

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

Instructions to the candidates:

1) ***Section - I carries 6 questions of 10 marks each. Answer any four questions in Section - I.***
2) ***Section - II carries 6 questions of 10 marks each. Answer any four questions in Section - II.***
3) ***Use two separate answer books for the Section - I and Section - II.***
4) ***Enter the question number clearly in the margin of the answer book beside each of your answer.***

SECTION - I

Q1) Explain the following statement "*For the phytochemist and pharmacognosist the knowledge of Ethnopharmacognosy and Ayurvedic system of medicines are a great opportunity*". **[10]**

Q2) What is Homeopathy system of medicine? Write Etymology and brief history of Homeopathy system of medicine. Write a brief note on Homeopathy medicine in Asia. **[10]**

Q3) Write down the differences between Ayurvedic medicines and Unanai medicines with respect to History, Philosophy and Preparation of Medicine. **[10]**

Q4) "*The use of toxic herbs and of toxic metals and minerals as ingredients in traditional Ayurvedic treatments is a major safety concern*" Explain the statement. **[10]**

P.T.O.

Q5) Enlist five drugs used in Ayurvedic medicine and homeopathic medicines. Give their comparative account. **[10]**

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

a) Rasa Shastra in Ayurvedic Practice.

b) The aim and practice of Panchakarma in a Ayurvedic system of Medicine.

c) Acupuncture.

d) Charaka Samhita.

SECTION - II

Q7) Define Churna. Write its method of preparation. What are characteristics of Churna? Enlist four examples of Churna formulations along with their important therapeutic uses. **[10]**

Q8) Define Taila. Write its method of preparation. What are characteristics of Taila? Enlist four examples of Taila along with their important therapeutic uses. **[10]**

Q9) What is Guggulu? Explain the process of sodhana. What are the characteristics of Sodhita Guggulu? How Sodhita Guggulu is stored and preserved? **[10]**

OR

Write an exahustive note on "The aim and types of Rasayan in Ayurveda".

Q10) Describe with illustrations the importance of microscopic, physical, chemical evaluation of Ayurvedic crude drugs. **[10]**

Q11) Write a brief note on Ayurvedic Skin care Cosmetics formulations. **[10]**

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

a) Ayurvedic Medicine : drug research and development, critical issues.

b) General method of preparation of Ghruta.

c) Rasa Dhatu in Ayurveda.

d) Asava.

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Total No. of Questions : 8] **[Total No. of Pages : 2**

P1686

[4056] - 117
M.Pharmacy (Common to Sem. - I & II)
NATURAL PRODUCT MANAGEMENT
(2008 Pattern)

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

Instructions to the candidates:

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

SECTION - I

Q1) Describe the detail method for processing of Cocoa and extraction of oil from Cocoa seed. **[10]**

Q2) Explain various methods for Quality control of important Medicinal plants of India. **[15]**

Q3) Explain the management of Land, Labor and various equipments required in agriculture practices. **[15]**

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

a) International Trading of few Important Medicinal Plants.
b) Factors affecting marketing of natural products.
c) Cultivation protocol for Prioritized Medicinal Plants.
d) Capital resources for farm analysis/planning.

SECTION - II

Q5) Describe the facilities required to develop the Herbal Extraction Plant with reference to Schedule M. **[10]**

P.T.O.

Q6) Define Nutraceuticals. Describe trading of Nutraceuticals and Phytoconstituents. **[15]**

Q7) Write the Global Regulatory affairs for herbal drugs. **[15]**

Q8) Explain legal requirements and processing techniques for import and export of Medicine and Cosmetics. **[15]**

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Total No. of Questions : 8] **[Total No. of Pages : 2**

P1687

[4056]-118

M.Pharmacy (Common to Sem. - I & Sem. - II)

MEDICINAL PLANT BIOTECHNOLOGY

(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 any two questions from Section-I and Section-II.***
2) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Describe in detail role of plant tissue culture in biosynthesis of secondary metabolites. **[10]**

Q2) a) Explain plant cell immobilization. **[8]**

b) Enlist applications of recombinant DNA technology in production of biologicals. **[7]**

Q3) a) Describe in detail production of shikonin by plant cell culture. **[8]**

b) Describe hairy root and multiple shoot culture along with applications. **[7]**

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

a) Organ culture.

b) In situ germ plasm conservation.

c) Isolation of protoplast.

SECTION - II

Q5) Describe in detail methods of enzyme immobilization. **[10]**

Q6) a) Give an account of physical maps using in situ hybridization. **[7]**

b) Write about RAPD markers for genetic maping. **[8]**

Q7) a) Discuss insect resistance in transgenic plants. **[8]**

b) Give types and properties of enzymes. **[7]**

P.T.O.

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

a) Molecular maps-RFLP.

b) Enzyme Purification.

c) Ti Plasmid.

Total No. of Questions : 8] **[Total No. of Pages : 1**

P1688

[4056]-201
M.Pharmacy (Sem. - II)
DRUG REGULATORY AFFAIRS
(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) Explain in detail schedule-M. **[10]**

Q2) a) Give salient features of consumer Protection Act. **[8]**

b) Write in detail on preperation of first register under pharmacy Act. **[7]**

Q3) Explain in detail provisions of DPCO. **[15]**

Q4) Explain in detail structure and functioning of any three certifying agencies. **[15]**

SECTION - II

Q5) Explain in detail concept of GCP. **[10]**

Q6) Explain the concept of "Innovation" as applicable to patents. Give suitable examples. **[15]**

Q7) Write in detail on any five general notices of I.P. **[15]**

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

a) DMF

b) Trade Marks

c) Pollution Control

d) GLP

Total No. of Questions : 8] **[Total No. of Pages : 2**

P1689

[4056]-202
M.Pharmacy (Sem. - II)
FORMULATIONS AND DEVELOPMENT
(2008 Pattern)

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

Instructions to the candidates:

1) ***Question number 1 and 5 are compulsory.***
2) ***Solve any two questions from the remaining in Section-I and Section-II.***
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 in detail various approaches for taste masking formulations. **[10]**

Q2) Explain in detail mucoadhesive drug delivery systems. **[15]**

Q3) Elaborate on the various excipients used for gastroretention of formulations. **[15]**

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

a) Self micro emulsified drug delivery systems.

b) Pulsatile drug delivery systems.

c) Formulation of colon targeted drug delivery systems.

d) Emulgels based on niosomes.

SECTION - II

Q5) Explain in detail the advances in aerosol inhalation systems and add a note on components of aerosol valve. **[10]**

Q6) Explain in detail nanopharmaceuticals. **[15]**

P.T.O.

Q7) Explain need and problems of designing veterinary dosage forms. Add a note on specialized dose dispensers. **[15]**

Q8) Write short notes on <u>any three</u> : **[15]**

a) Aerosol Propellants.
b) Manufacturing of aerosols.
c) Regulatory perspective of selection and evaluation of pharmaceutical packaging materials.
d) Multiple emulsion.

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Total No. of Questions : 8] **[Total No. of Pages : 2**

P1690

[4056]-203
M.Pharmacy
NOVEL DRUG DELIVERY SYSTEMS
(2008 Pattern) (Sem. - II)

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

Instructions to the candidates:

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

SECTION - I

Q1) Enlist the oral novel drug delivery systems. Describe the mechanism of push pull osmotic pump. **[10]**

Q2) Give approaches to formulation of floating type gastric retentive drug delivery systems along with its evaluation. **[15]**

Q3) What is mucoadhesion? Describe the mechanism of mucoadhesion. Explain the evaluation methods for mucoadhesive DDS. **[15]**

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

a) Biodegradable microspheres.

b) Long acting contraceptive formulations.

c) Mechanism of transmucosal transport of drugs.

SECTION - II

Q5) Describe evaluation procedures for colon targeted drug delivery. **[10]**

Q6) Describe different approaches to targeting drug delivery to brain. **[15]**

Q7) Describe the protein and peptide drug delivery. Give its limitations. **[15]**

P.T.O.