**MPAN20112**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutical Analysis**

**Paper- I: Spectroscopic Methods of Analysis**

(Regulation 2012-13)

Time : 3 Hours Maximum Marks: 70

Answer all the questions. All questions carry equal marks.

1. a) Write short notes on
   a) Bathochromic shift b. Chromophores
   b) How do you differentiate the following using UV spectroscopy?


(OR)

   c) Write short notes on factors effecting UV absorbance
   d) How do you differentiate the following using UV spectroscopy?


   a) Electronic transitions in UV spectroscopy b) MBTH reagent

2. a) Write in detail on i) Sampling methods used in IR spectroscopy ii) Characteristic features of IR spectrum and their analytical application in structural studies of organic compounds.

(OR)

   b) Write in detail on i) Attenuated Total Reflectance in FT-IR ii) Identification of organic functional groups from IR spectrum

3. a) With a neat sketch explain the principle involved in NMR spectroscopy. Explain the significance of chemical shift (σ) and coupling constant (J) in structure analysis. Draw the 1H NMR spectrum of toluene and note their σ and J values.

(OR)

   b) Write short notes on i) Sample preparation for NMR ii) $^{13}C$ NMR

4. a) Write short notes on i) FABMS ii) Mc-Lafferty rearrangement iii) Molecular ion

(OR)

   b) Write short notes on i) TOF analyzer ii) Mass spectrometry as a detector for HPLC

5. a) Explain the theory, principle and procedure involved in determination of i) Phosphorous ii) chlorine

(OR)

   b) Explain the theory, principle and procedure involved in determination of i) Sample preparation techniques in AAS ii) Factors effecting sample analysis in AAS.

**MPAN20212**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutical Analysis**

**Paper- II: Advanced Analytical Techniques**

(Regulation 2012-13)

Time : 3 Hours Maximum Marks: 70

**Answer all the questions. All questions carry equal marks.**

1. a) Write short notes on
   i) Transitions observed in X-ray fluorescence spectroscopy
   ii) Phase problem in X-ray crystallography

   (OR)
2. a) Sampling methods for XRD analysis
   b) Quantitative and qualitative analysis using XRD

3. Enumerate thermal methods of analysis. Write in detail on thermo gravimetric analysis.

   (OR)
4. a) With a neat sketch explain the following observed in DSC analysis of a sample.
   i) Glass transition temperature
   ii) Melting
   iii) Vulcanization

5. a) Write short notes on
   i) Principles of light scattering observed in fluorescence spectroscopy
   ii) Measurement of fluorescence intensity and its interpretation

   (OR)
6. With a neat sketch explain the working of fluorescence spectrophotometer. Add a note on factors affecting its sensitivity.

7. With a neat sketch explain the instrumentation and working of Circular Dichroism instrument. Add a note on selection rule in CD.

   (OR)
8. Write in brief on plane polarized light. Explain how ORD helps in analysis of organic compounds?

9. What are radioactive isotopes? Explain their applications in pharmaceutical analysis. Add a note on RIA.

   (OR)
10. a) Write short notes on
    i) Plasma sources used in ICP-MS
    ii) Applications and disadvantages of ICP-MS

**MPAN20312**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutical Analysis**

**Paper- III: Quality Assurance and Quality Control**

(Regulation 2012-13)

Time : 3 Hours Maximum Marks: 70

**Answer all questions**
**All questions carry equal marks**

1. Write the quality control tests for tablets as per Indian Pharmacopoeia.

OR

2. Explain the evaluation tests for parenterals.

3. Write about the maintenance of utilities and services as per GMP.

OR

4. Write about i) ISO 9000 ii) TQM (2x7M)

5. Enumerate the factors influencing the vendor selection. How purchase specifications are effected with this selection?

OR

6. What is quality audit and how this will help in bringing out quality in manufacturing process? Explain with suitable examples.

7. Give the classification of plastics suitable of pharmaceutical packaging. Write the quality control tests for plastics.

OR

8. Write about closures and closure liners and discuss their quality control tests .

9. Explain the evaluation of complaints and recall procedures.

OR

10. Write about waste and scrap disposal procedures and maintenance of records for these procedures.

**MPAN20412**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutical Analysis**

**Paper- IV: Validation and Documentation**

(Regulation 2012-13)

Time : 3 Hours | Maximum Marks: 70

**Answer all questions**
**All questions carry equal marks**

1. Write about different air handling zones and explain their validation procedure.

OR

2. Explain the validation process for granulation and compression.

3. Write about the validation of the following:
   a) UV spectrophotometric analytical method as per ICH guidelines. 7
   b) Validation of dissolution apparatus. 7

OR

4. Describe the validation of HPLC instrument.

5. Mention the significance of data in the pharmaceutical R&D. Give the classification of data storage methods and discuss their relative merits.

OR

6. Explain the methods for data generation and it retrieval.

7. Discuss the significance of quality audit and explain the methods for quality audit.

OR

8. Write about the following:
   a) Batch release 7
   b) Quality review 7

9. Explain the validation of facilities for contract manufacturing.

OR

10. What are the advantages and disadvantages of contract manufacturing? Write about factors influencing the selection of contract manufacturer.

**MPPC20112**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutics**

**Paper- I: Advances in Drug Delivery Systems-I**

(Regulation 2012-13)

Time : 3 Hours | Maximum Marks: 70

**Answer all the questions**
**All questions carry equal marks**

1. Enumerate the factors influencing the design of controlled drug delivery systems citing suitable examples.

OR

2. Discuss the applications of different polymers for the design of controlled drug delivery systems.

3. Explain the formulation and sterilization of parenteral controlled drug delivery systems.

OR

4. a) Write about the evaluation techniques for oral controlled drug delivery systems. 8
   b) Write the significant evaluation tests for transdermal drug delivery systems. 6

5. a) Explain the evaluation tests for bioadhesion. 6
   b) Write about the fabrication and working of intra uterine device. 8

OR

6. Write the advantage of nasal drug delivery with suitable examples. Mention the problems with nasal route? Explain the methods for nasal drug delivery.

7. Explain the preparation and evaluation of monoclonal antibodies. Mention their advantages over other novel drug delivery systems.

OR

8. a) Describe the evaluation methods for liposomes. 8
   b) Explain the principle and method of coacervation-phase separation. 6

9. Mention the need for drug targeting to neoplastic diseases and explain the methods for drug targeting to neoplastic diseases.

OR

10. Write about the barriers for drug transport to brain? Explain the methods for disruption of blood-brain barrier. Mention the qualities of drugs suitable for brain targeting.

**MPPC20212**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutics**

**Paper- II: Advanced Bio-Pharmaceutics**

(Regulation 2012-13)

Time : 3 Hours Maximum Marks: 70

**Answer all the questions**
**All questions carry equal marks**

1. Explain the factors influencing the drug absorption through gastro intestinal tract highlighting the influence of gastric environment.

OR

2. Explain the drug absorption mechanisms highlighting their advantages and disadvantages with suitable examples.

3. Discuss the influence of physico-chemical properties of drug on its absorption.

OR

4. Explain the influence of pharmaceutical factors on drug disintegration and dissolution and how they are improved?

5. Write about the formulation factors influencing the bioavailability of drug from capsules.

OR

6. Enumerate the role of parenteral route in the improvement of bioavailability of drugs . What are the limitations? Write the role of excipients in the parenteral preparation.

7. Explain the methods for in vitro-in vivo correlation. Mention the need for these correlations.

OR

8. Explain the official dissolution testing method for controlled release and transdermal products.

9. Compare the methods for assessing the bioavailability.

OR

10. Write about the following:
    a) BCS classification and its significance
    b) Comparison of dissolution profiles

**MPPC20312**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutics**

**Paper- III: Advanced Pharmacokinetics**

(Regulation 2012-13)

Time : 3 Hours | Maximum Marks: 70

**Answer all the questions**
**All questions carry equal marks**

1. a) Write about apparent volume of distribution, biological half life and renal clearance mentioning their significance. 9

   b) The plasma concentration of a drug after i.v. bolus administration of 300mg dose was found to be 10.0 and 5.5 mcg/ml at 2 and 4 hours respectively. Assuming one compartment kinetics calculate $t_{1/2}$, $V_d$, and total systemic clearance. 5

OR

2. Differentiate between compartment and non-compartment analysis. Explain different physiological models.

3. Explain the reasons for non-linear kinetics and discuss the significance of Michaelis Menten equation. How it transforms under different conditions?

OR

4. Explain the calculation of $V_{max}$ and $K_m$ by using different approaches and discuss their relative merits.

5. Explain different biological rhythms and how they are effecting the pharmacokinetics. Mention the reasons for time dependency of pharmacokinetics.

OR

6. Enumerate the approaches for delivering the drugs following time dependent kinetics.

7. Write about the sites of metabolism of drugs with suitable examples.

OR

8. Give the differences between phase I and II biotransformation reactions and explain phase I biotransformation reactions.

9. Explain pharmacokinetic drug interactions with suitable examples.

OR

10. Explain the influence of food, beverages and smoking on drug action citing suitable examples.

**MPPC20412**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutics**

**Paper- IV: Advances in Drug Delivery Systems-II**

(Regulation 2012-13)

Time : 3 Hours Maximum Marks: 70

**Answer all the questions**
**All questions carry equal marks**

1. Discuss the role of plasma membranes in modulating the drug absorption.

OR

2. Mention the reasons for multi drug resistance and explain methods for overcoming the same.

3. Write about ex vivo and in vivo gene therapy.

OR

4. What are the potential target diseases for gene therapy? Explain the approaches for treating them.

5. Define genomics and proteomics and discuss their role in bioinformatics.

OR

6. Explain how drug disposition and drug response are effected by pharmacogenomics.

7. Explain the methods for preparation of engineered proteins by DNA technology.

OR

8. Write about novel delivery systems for delivery of insulin.

9. Enumerate the methods for delivery of vaccines using biodegradable polymers.

OR

10. Write about the following :
    a) Absorption enhancers 7
    b) Oral immunization 7

**MPPH20112**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutical Chemistry**

**Paper- I: Advanced Organic Chemistry-II**

(Regulation 2012-13)

Time : 3 Hours Maximum Marks: 70

**Answer all the questions**
**All questions carry equal marks**

1. Write in brief with suitable examples about Linear Synthesis and Convergent Synthesis.

OR

2. Write about one group disconnections and two group disconnections with suitable examples.

3. Write about the importance of stereochemistry in drug action. Explain enantiomers and diastereo isomers with examples in relation to drug action. Write about stereo specific and stereo selective synthesis.

OR

4. Write the synthesis of Ibuprofen and Propranolol.

5. Write the importance and advantages of green chemistry. What are the various reagents, catalysts and solvents used in green chemistry? Write about green synthesis of Willianson's and witting reactions.

OR

6. What do you mean by microwave assisted synthesis? Give suitable microwave reactions in organic solvents giving suitable examples. What are the advantages of microwave techniques?

7. Write a note on Claisen rearrangement reaction with suitable example. Write the reactions involved in Pyridine-N-Oxides and amino pyridines.

OR

8. Write two methods of synthesis of the following heterocyclic compounds:
   (a) Indoles
   (b) Oxazoles and
   (c) Thiazoles

9. Write the chiral drug synthesis of Levofloxacin and Ramipril.

OR

10. Two methods of synthesis of pyrimidines and Benzimidazoles.

**MPPH20212**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutical Chemistry**

**Paper- II: Advanced Medicinal Chemistry**

(Regulation 2012-13)

Time : 3 Hours Maximum Marks: 70

**Answer all the questions**

**All questions carry equal marks**

1. What are prodrugs? Classify them. Write in detail the strategies to develop prodrugs with suitable examples. Write a note on soft drugs and isosterism.

OR

2. What is drug design? Give some examples of lead molecules from natural products. Write their molecular modifications with suitable examples.

3. What is the role of QSAR in drug design. What are the various parameters used in QSAR? Write a role in Hash Analysis.

OR

4. Write briefly about CoMFA. Selection of grid molecule with suitable example and their advantages and disadvantages.

5. What is structure based drug design. How will you select a protein molecule, pharmacophore perception, prediction of a molecule. Write a note on computational chemistry.

OR

6. Write briefly about combinational chemistry. What are its advantages? Write briefly on concepts of Tea bag method and Pin method.

7. Write a brief account on concepts of High throughput screening. Write about G-coupled colourimetric and fluorimetric methods.

OR

8. Classify anti-cancer agents with suitable examples. What are the basic steps in designing a new anti cancer agents with suitable examples. Write the synthesis of methotrexate and chlorambucil.

9. Classify psychopharmacological agents. Their MOA with suitable examples. Write the SAR of phenothiazines Development of Atypical anti psychotics and write the synthesis of Haloperidol.

OR

10. Write briefly about Drug discovery by Recombinant DNA technology. Write a note on virtual screening, structural features and pharmacological activities with suitable examples.

**MPPH20312**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutical Chemistry**

**Paper- III: Chemistry of Natural Products**

(Regulation 2012-13)

Time : 3 Hours Maximum Marks: 70

**Answer ALL Questions**

1. (a) Write in detail on structure, SAR of morphine. Add a note on morphine antagonists.

(OR)

(b) Write the structure, MOA and SAR of Papavarine and quinine.

2. (a) Explain the significance of natural products as anticancer agents. Write SAR and MOA of Taxol

(OR)

(b) Why marine sources are considered as a very rich sources for obtaining novel drugs? Add a note on marine derived anticancer agents.

3. (a) Explain how Marker's synthesis contributed to the development of steroid industry? Add a note on steroidal anti-inflammatory agents.

(OR)

(b) Discuss the rationale for development of anabolic steroids.

4. (a) Compare the chemistry and structure of penicillin and cephalosporins. Add a note on ~ lactamase inhibitors.

(OR)

(b) Discuss the MOA and SAR of cephalosporins. Write in detail on antipseudomonal cephalosporins.

5. Write the structure elucidation of the following by UV, IR, NMR and Mass spectral analysis

(a) Luteolin-7-0-glucoside

(OR)

(b) Progesterone

**MPPH20412**

**M.Pharmacy Degree Examinations - August, 2018**

**II Semester - Pharmaceutical Chemistry**

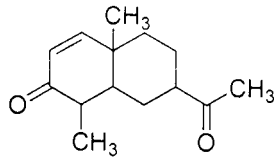
**Paper- IV: Spectral Analysis**

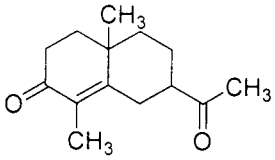
(Regulation 2012-13)

Time : 3 Hours | Maximum Marks: 70

**Answer ALL Questions**

1. Explain the terms chromophores and auxochromes. A natural product is known to have either structure A or B. The ultraviolet spectrum in alcohol has Amax 252 nm. Which structure is the most likely one?

A) 

B) 

(OR)

Discuss the principle and applications of Beer-Lambert's Jaw. How do you differentiate the following using UY spectroscopy?

2. Explain the factors influencing the resolution of an NMR instrument. Add a note on sample preparation techniques and internal standards.

(OR)

Draw the predicted 1HNMR spectrum of trans-cinnamic acid and discuss the splitting pattern and coupling constants.

3. What is proton decoupled $^{13}$CNMR? Discuss the factors influencing chemical shift values in $^{13}$CNMR spectrum.

(OR)

Draw predicted $^{13}$CNMR spectrum and DEPT spectrum of benzaldehyde. Explain the chemical shift patterns observed for the aromatic carbons.

4. Write a note on analysers used in mass spectrometry, their advantages and disadvantages. Suggest an appropriate combination of ionization technique and analyser for the mass spectral analysis of digoxin.

(OR)

Write in detail on principle, instrumentation and applications of ESI-MS.

5. Explain the principle, procedure and applications of HMQC technique. Draw the predicted HMQC spectrum of but-1-ene ($H_2C$=CH-$CH_2$-$CH_3$)

(OR)

Explain the principle, procedure and applications of HETCOR technique. Draw the predicted HETCOR spectrum of pent-2-yne .

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