

**FACULTY OF PHARMACY**

**M. Pharmacy I - Semester (PCI) (Common to All) (Main & Backlog) Examination,  
June 2024**

**Subject: Modern Pharmaceutical Analytical Techniques**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any Five questions. All questions carry equal marks.**

1. (a) Explain different methods of single component and Multicomponent analysis of Pharmaceutical formulation by UV-Visible Spectroscopy. [9]  
(b) Explain the electronic transitions in UV spectroscopy. [6]
2. (a) Explain the molecular vibrations in IR. [8]  
(b) Write the sampling methods in IR spectroscopy. [7]
3. (a) Explain the principle of fluorescence. Add a note on quenching effect.  
(b) With a diagram explain the instrumentation for AAS. [8+7]
4. (a) Explain the principle and Instrumentation of NMR Spectroscopy. [8]  
(b) Write a note on spin-spin coupling and Applications of NMR [7]
5. (a) Classify the ionization techniques in MS. Explain any three methods in detail. [9]  
(b) Define Base peak, molecular ion peak and metastable ion. [6]
6. (a) Write the principle and instrumentation of flame photometry. [7]  
(b) Write notes on any two GC detectors with a neat labeled diagram. [8]
7. (a) Briefly explain the source of AA. [8]  
(b) List and explain the interferences. [7]
8. Discuss the principle, instrumentation working and application of [7+8]  
(a) Paper electrophoresis  
(b) Gel electrophoresis

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I - Semester (PCI) (Main & Backlog) Examination,  
June 2024**

**Subject: Industrial Pharmacognostical Technology**

**Time: 3 Hours**

**Max Marks: 75**

**Note : Answer any five questions. All questions carry equal marks.**

1. Define the term evaluation of crude drugs. Describe in detail about WHO guidelines in standardization of Herbal drugs. [15]
2. (a) Write about the Ayurvedic Pharmacopoeia and Indian Pharmacopoeia. [8+7]  
(b) Write about the Indian laws applicable to herbal drugs.
3. Write the importance of stability studies. Describe the various methods of stability testing. [15]
4. Discuss about [5+5+5]  
(a) Copy rights.  
(b) Total Quality management  
(c) Entrepreneurship development
5. Discuss in detail about Good manufacturing practices in Herbal drug industry. [15]
6. Define the terms TQM, Quality control, GLP. Write the concepts of any two. [15]
7. Define terms IPR and Patent. Write the objectives and process of patenting in India. [15]
8. Give monograph of following drugs. [5+5+5]  
1. Cinchona 2. Ephedra 3. Turmeric

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Code No: F-7250/PCI

**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I - Semester (PCI) (Main & Backlog) Examination,  
June 2024**

**Subject: Phytochemistry**

**Time: 3 Hours**

**Max Marks: 75**

**Note : Answer any five questions. All questions carry equal marks.**

1. Discuss the principles of extractions techniques. Write the principle, merits and demerits of any three techniques. [15]
2. Describe the chemistry and isolation of [5+5+5]  
(a) Ephedrine (b) Hecogenin (c) Digitoxin
3. Discuss the role of Herbs in drugs discovery process. Write the selection and optimization of lead compounds using suitable examples. [15]
4. Elucidate the structure of following compounds using spectroscopic techniques. [5+5+5]  
(a) Caffeine (b) Citral (c) Luteolin
5. Write about the principles and applications of flash chromatography and preparative HPLC. [15]
6. Discuss the principle and applications of LC/MS and GC/MS in elucidation of Phytoconstituents. [15]
7. Write the chemistry, isolation and biosynthesis of sennosides & Digitoxin. [15]
8. Give the sources, chemistry, isolation, estimation and biosynthesis of glycyrrhizin. [15]

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Main & Backlog) Examination,  
June 2024**

**Subject: Advanced Pharmacognosy- I**

**Time: 3 Hours**

**Max.Marks:75**

**Note: Answer any five questions. All questions carry equal marks.**

1. (a) Discuss the role of Pharmacognosy in herbal drug industry. [7]  
(b) Explain current good cultivation and collection practices of medicinal Plants. [8]
2. Discuss on marine drug research. Give a note on problems faced in it. [10]
3. Give biological source, marker compounds, medicinal uses and health benefits of  
(a) Soya bean [7.5]  
(b) Turmeric. [7.5]
4. What are Phytopharmaceuticals? Write informative notes on [3]  
(a) Carotenoids [6]  
(b) Withanolides. [6]
5. (a) Write about WHO guidelines for safety monitoring of natural medicines. [7]  
(b) Write notes on bio-drug drug interactions with suitable examples. [8]
6. Write notes on  
(a) In-situ conservation of medicinal plants. [7.5]  
(b) Natural Antioxidants [7.5]
7. Write notes on  
(a) Vitamin Supplements [7.5]  
(b) FSSAI guidelines [7.5]
8. Write notes on occurrence and characteristic features of  
(a) Shatavarins [7.5]  
(b) Flavonoids. [7.5]

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**FACULTY OF PHARMACY**

**M.Pharmacy I-Semester (PCI) (Common to all) (Backlog) Examination,  
November-2023**

**Subject: Modern Pharmaceutical Analytical Techniques**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any Five Questions. All Questions carry Equal marks.**

1. a) Explain the electronic transitions with suitable examples  
b) State and explain Beer- Lambert's law. Add a note on the deviations from Beer's law. (6+9)
2. a) Explain the sampling techniques in IR spectroscopy.  
b) What are the applications of IR spectroscopy (9+6)
3. a) What is the principles of flame photometry? Explain the instrumentation.  
b) What are the factors affecting fluorescence? (9+6)
4. a) Explain chemical shift and the factors affecting chemical shift ?  
b) Draw a schematic NMR spectrum and explain splitting  $\alpha$  signal intensity. (10+5)
5. With a neat labelled diagram, explain MS instrumentation. Draw MS spectrum for any two compounds  $\alpha$  explain its peaks.
6. a) Classify the ionization techniques in MS. Explain any three methods in detail.  
b) Explain the fragmentation rules in MS. (9+6)
7. a) Explain HPLC instrumentation with a labelled diagram.  
b) Explain the factors affecting resolution & peak symmetry. (8+7)
8. a) Explain the principle and applications of capillary electrophoresis  
b) Classify the types of crystals and add a note on the applications of X-ray diffraction. (8+7)

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I Semester (PCI) (Backlog) Examination,  
November 2023**

**Subject: Industrial Pharmacognostical Technology**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

1. Describe the location; layout, infrastructure and regulatory requirements for establishing herbal drug industry. [15]
2. Discuss about Exim and Trips policy with reference to herbal drugs. [15]
3. Write in detail about good laboratory practice in Herbal Industry. [15]
4. Write a note on [5+5+5]
  - (a) Ayurvedic Pharmacopoeia
  - (b) British Herbal Pharmacopoeia
  - (c) Siddha Pharmacopoeia.
5. Define the term evaluation of crude drugs. Describe in detail about WHO guidelines in standardization of Herbal drugs. [15]
6. Describe the monographs of following drugs. [5+5+5]
  - (a) Withania (b) Digitalis (c) Artemisia
7. Write the importance of stability studies. Describe the various methods of stability testing. [15]
8. Write about [5+5+5]
  - (a) Geographical indication
  - (b) Copy rights
  - (c) Patent filling.

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**FACULTY OF PHARMACY**  
**M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Backlog) Examination,**  
**November 2023**  
**Subject: Phytochemistry**

**Time: 3 Hours**

**Max.Marks:75**

**Note: Answer any five questions. All questions carry equal marks.**

1. a) Discuss the importance of drug discovery process and methods of drug discovery techniques. [7+8]  
b) Write the role of plants in drug discovery process using suitable examples.
2. Write the chemistry, isolation and biosynthesis of Sennosides and Digitoxin [15]
3. Describe the biological source, chemistry and isolation of [5+5+5]  
a) Ephedrine b) Piperine c) Quercitin
4. Discuss the principle and applications of LC/MS and GC/MS in elucidation of phytoconstituents. [15]
5. Elucidate the structure of following compounds using spectroscopic techniques [5+5+5]  
a) Carvone b) Citral c) Menthol
4. Define and classify the extractions techniques. Write the principle, merits and Demerits any four extraction techniques. [15]
7. Define and classify the chromatography techniques. Give the principle, Instrumentation and applications of HPLC. [15]
8. a) Write about protocol design of lead molecule [8+7]  
b) Flash chromatography

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I Semester (PCI) (Backlog) Examination, November 2023**

**Subject: Advanced Pharmacognosy- I**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

1. (a) Write the importance of Pharmacognosy in herbal drug industry. [5]  
(b) Discuss about current good cultivation and collection practices of medicinal Plants. [10]
2. (a) Explain recent advances in marine drugs research. [10]  
(b) Write notes on marine toxins. [5]
3. Give biological source, marker compounds, medicinal uses and health benefits of  
(a) Soya bean [7.5]  
(b) Garlic. [7.5]
4. What are Phytopharmaceuticals? Write informative notes on [3+6+6]  
(a) Flavonoids (b) Vitamins
5. (a) WHO guidelines for safety monitoring of natural medicines . [7]  
(b) Write notes on bio-drug drug interactions with suitable examples. [8]
6. Write notes on  
(a) In-situ conservation of medicinal plants. [7.5]  
(b) Formulation of nutraceuticals [7.5]
7. Write notes on  
(a) Dietary fibres [7.5]  
(b) FSSAI guidelines [7.5]
8. Write notes on occurrence and characteristic features of  
(a) Withanolides [7.5]  
(b) Taxol. [7.5]

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Code No: E-12297/PCI

**FACULTY OF PHARMACY**

**M. Pharmacy I Semester (PCI) (Common to all) (Main & Backlog) Examination,  
May 2023**

**Subject: Modern Pharmaceutical Analytical Techniques**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any Five Questions. All Questions carry Equal marks.**

1. a) With a neat labelled diagram explain UV/Visible instrumentation.  
b) What are the criteria in the solvent selection for UV spectroscopy? Give examples for solvents. What is meant by solvent effect? (9+6)
2. a) Explain the Principle, advantages and instrumentation of FTIR with a neat labelled diagram.  
b) Explain the molecular vibrations in IR spectroscopy. (10+5)
3. a) Explain the principle of fluorescence. Add a note on quenching effect  
b) With a diagram explain the instrumentation for AAS. (8+7)
4. a) Explain the principle of proton NMR spectroscopy.  
b) Explain the spin-spin coupling in NMR spectroscopy with suitable example. (7+8)
5. a) Explain the principle of mass spectroscopy.  
b) Explain any two mass analysers used in MS in detail. (7+8)
6. a) Explain GC instrumentation with a labelled diagram.  
b) Explain the applications of XRD technique. (9+6)
7. a) Explain the instrumentation & working of HPLC. (8+7)  
b) Explain the factors affecting resolution & Peak symmetry.
8. Define and classify the electrophoretic techniques. Explain the principle and applications of gel electrophoresis. (15)

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G.Pulla Reddy College of Pharmacy  
Hyderabad

Code No: E-12307/PCI

**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I Semester (PCI) (Main & Backlog) Examination,  
May 2023**

**Subject: Advanced Pharmacognosy- I**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

1. (a) Write the importance of Pharmacognosy in herbal drug industry. [7]  
(b) Discuss about current good agricultural practices in cultivation of medicinal plants. [8]
2. Explain general methods of isolation and purification of marine drugs. [15]
3. Give biological source, marker compounds, medicinal uses and health benefits of  
(a) Spirulina [7.5]  
(b) Garlic. [7.5]
4. What are Phytopharmaceuticals? Write informative notes on [3+6+6]  
(a) Carotenoids (b) Flavonoids
5. Discuss on spontaneous reporting schemes for biodrug adverse reactions. [15]
6. Write notes on  
(a) In-situ conservation of medicinal plants. [7.5]  
(b) Marine toxins [7.5]
7. Write notes on  
(a) Dietary fibres [5]  
(b) Antioxidants [5]  
(c) Polyunsaturated fatty acids [5]
8. Write notes on occurrence and characteristic features of  
(a) Andrographolides [7.5]  
(b) Gugulipids. [7.5]

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Code No: E-12308/PCI

**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Main & Backlog) Examination,  
May 2023**

**Subject: Phytochemistry**

**Time: 3 Hours**

**Max.Marks:75**

**Note: Answer any FIVE questions. All Questions carry Equal Marks.**

1. Discuss the role of Herbs in drugs discovery process. Write the selection and optimization of lead compound using suitable examples. [15]
2. Give the biological source, chemistry, isolation and biosynthesis of Digitoxin [15]
3. Describe the chemistry and isolation of [5+5+5]  
a) Quinine b) Sennosides c) Withanolides
4. Define and classify the extractions techniques. Write the principle, merits and demerits any four extraction techniques. [15]
5. a) Write about protocol design of lead molecule [7+8]  
b) Flash chromatography
6. Write the principle, instrumentation and applications of HPTLC [15]
7. Elucidate the structure of following compounds using spectroscopic techniques [5+5+5]  
a) Carvone b) Citral c) Menthol
8. Discuss the principle and applications of LC/MS and GC/MS in elucidation of phytoconstituents. [15]

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Code No: E-12309/PCI

**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I - Semester (PCI) (Main & Backlog) Examination,  
May 2023**

**Subject: Industrial Pharmacognostical Technology**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

**(5 x 15 = 75 Marks)**

1. Discuss in detail about Good manufacturing practices in Herbal drug industry. [15]
2. Give monograph of following drugs. [5+5+5]  
(i) Cinchona (ii) Ephedra (iii) Turmeric
3. Define the term evaluation of crud drugs. Describe in detail about WHO guidelines in standardization of Herbal drugs. [15]
4. Write the importance of stability studies. Describe the various methods of stability testing. [15]
5. Define terms IPR and Patent. Write the objectives and process of patenting India. [15]
6. Write about [5+5+5]  
(a) Geographical Indications.  
(b) Opposition and revocation patent  
(c) Patent search and literature search.
7. Write note on [5+5+5]  
(a) Clinical laboratory testing  
(b) Exim policy  
(c) TRIPS
8. Discuss about [5+5+5]  
(a) Copy rights  
(b) Total Quality Management  
(c) Entrepreneurship development

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**FACULTY OF PHARMACY**

**M. Pharmacy (Common to All) I - Semester (PCI) (Backlog) Examination,  
December 2022**

**Subject: Modern Pharmaceutical Analytical Techniques**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) With a neat labelled diagram explain UV/Visible spectrophotometer instrumentation.  
(b) What are the applications of UV spectroscopy?
- 2 (a) Explain the molecular vibrations in IR.  
(b) Write the sampling methods in IR spectroscopy.
- 3 (a) Explain the principle of fluorescence.  
(b) With a diagram explain the instrumentation for flame photometry.
- 4 (a) Explain the principle of proton NMR spectroscopy.  
(b) Explain the following in NMR spectroscopy: Shielding and deshielding, chemical shift.
- 5 (a) Explain the principle of mass spectroscopy.  
(b) Explain any two mass analysers used in MS in detail.
- 6 (a) Explain GC instrumentation with a labelled diagram. Add a note on the different types of GC columns.  
(b) List and explain any 2 GC detectors.
- 7 (a) Explain Braggs equation and derive the equation.  
(b) Explain the principle and types of Paper electrophoresis.
- 8 (a) Explain the principle and applications of ELISA?  
(b) Explain the principle and applications of capillary electrophoresis.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I Semester (PCI) (Backlog) Examination,  
December 2022**

**Subject: Advanced Pharmacognosy – I**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Write about good cultivation practices for medicinal and aromatic plants.  
(b) In situ conservation of medicinal plants.
- 2 (a) Discuss the problems encountered in marine products research  
(b) Marine toxins
- 3 (a) Define and classify dietary fibres with examples and explain how dietary fibres are useful for prevention and treatment of diseases.  
(b) Write a note on omega 3 fatty acids.
- 4 (a) What are phytoestrogens and give the examples. Write the source, chemical constituents and medical uses and health benefits any two phytoestrogens.  
(b) Functions of ginseng.
- 5 What are carotenoids and flavonoids and write the source, structure, method of isolation and medical uses and health benefits of beta carotene and rutin.
- 6 Write about  
(a) Isolation of Guggul lipids  
(b) Spirulina
- 7 Define and classify antioxidants and explain the role of antioxidants in prevention of different diseases.
- 8 Write about WHO and AYUSH guidelines for safety monitoring of herbal drugs.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I - Semester (PCI) (Backlog) Examination,  
December 2022**

**Subject: Industrial Pharmacognostical Technology**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- 1 Describe the WHO guidelines in standardization of Herbal drugs.
- 2 Write about  
(a) Rights of patentee (b) Patent search and literature  
(c) Opposition and revocation of patent.
- 3 Describe the importance of stability testing and write about the methods of stability testing.
- 4 Give an informative note on  
(a) Geographical indications  
(b) Copyrights
- 5 Write in detail about GMP practices in Herbal drug Industry.
- 6 Discuss about (a) EXIM policy (b) TRIPS
- 7 (a) What are the regulatory requirements for herbal drug Industry.  
(b) Give an informative note on Ayurvedic pharmacopoeia.
- 8 Explain the procedure of patent filling and processing in India.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I Semester (PCI) (Backlog) Examination,  
December 2022**

**Subject: Phytochemistry**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) What are basic metabolic Pathways and write their importance.  
(b) Write an informative note on radio tracer technique.
- 2 Write the sources, chemistry, isolation, uses and mechanisms of action of  
(a) Sennosides  
(b) Quinine
- 3 (a) Briefly describe the methods of drug discovery process.  
(b) What is lead and discuss the selection of lead compounds.
- 4 Write about  
(a) Selections of solvent system for extraction.  
(b) Successive extraction technique  
(c) Super critical extraction technique
- 5 Elucidate the structure by spectroscopic technique  
(a) Caffeine (b) Citral (c) Carvone
- 6 Explain the chemistry and biosynthesis of Digitoxin and Ephedrine.
- 7 Describe the importance of clinical studies and explain the Phases of clinical trials.
- 8 Discuss the principle, instrumentation and applications of HPLC.

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**FACULTY OF PHARMACY**

**M. Pharmacy I - Semester (Common to All) (PCI) (Main & Backlog)  
Examination, May 2022**

**Subject: Modern Pharmaceutical Analytical Techniques**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions.**

**(5 x 15 = 75 Marks)**

- 1 (a) State and explain Beer-Lambert's Law. Add a note on the deviations from Beer's law.  
(b) Explain the concept of chromophore, auxochrome and bathochromic shift with suitable examples.
- 2 (a) Explain the instrumentation of FTIR with a neat labelled diagram. Add a note on the advantages of FTIR.  
(b) Explain the molecular vibrations in IR.
- 3 (a) What is the principle AAS? Explain the instrumentation.  
(b) List the differences between AAS and flame photometry.
- 4 What is the significance of chemical shift? What are the factors affecting chemical shift? Name the internal standard and justify its selection as internal standard in NMR spectroscopy.
- 5 What is the principle of Mass Spectrometry? With a neat labelled diagram briefly explain the components of MS instrumentation.
- 6 (a) Classify the ionization techniques in MS. Explain any three methods in detail.  
(b) Define Base peak, molecular ion peak and metastable ion.
- 7 (a) Explain the principle of X-ray diffraction.  
(b) Explain HPLC instrumentation with a labelled diagram.
- 8 (a) Explain the experimental set up required for gel electrophoresis.  
(b) Describe the principle and applications of RIA.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Main & Backlog) Examination,  
May 2022**

**Subject: Industrial Pharmacognostical Technology**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions.**

**(5 x 15 = 75 Marks)**

- 1 Describe the problems in standardization of Herbal drugs. Discuss the infrastructure for production of herbal dosage forms.
- 2 Write about
  - (a) EXIM policy
  - (b) TRIPS
- 3
  - (a) Write the regulatory requirements for herbal drug industry.
  - (b) Describe the concepts of TQM.
- 4
  - (a) Write an informative note on Ayurvedic Pharmacopoeia.
  - (b) Describe the GLP aspects in Herbal drug Industry.
- 5 Write about the WHO guidelines in quality assessment of herbal drugs.
- 6 Describe the importance of stability testing and write about the methods of stability testing.
- 7 Write a note on
  - (a) Geographical indications
  - (b) Copy rights
  - (c) Rights of patentee.
- 8 Explain the procedure of patent filling and processing in India.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I - Semester (PCI) (Main & Backlog) Examination,  
May 2022**

**Subject: Phytochemistry**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions.**

**(5 x 15 = 75 Marks)**

- 1 (a) Write the importance of tracer techniques and give its applications.  
(b) Describe the biosynthesis, and isolation of quinine.
- 2 Write the sources, chemical structure and isolation of Dogoxin, sennosides and Piperine.
- 3 (a) Briefly describe the methods of drug discovery process.  
(b) What is lead and discuss the selection of lead compounds.
- 4 Describe the importance of clinical studies and explain the Phases of clinical trials.
- 5 Write the principles of extraction. List the methods of extraction techniques and write the merits and demerits.
- 6 Write about  
(a) Preparative HPLC  
(b) Flash Column chromatography.
- 7 Write the principle, instrumentation and application of HPTLC.
- 8 Elucidate the structure by spectroscopic technique  
(a) Menthol (b) Caffeine (c) Nicotine.

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**FACULTY OF PHARMACY**  
**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Main & Backlog)**  
**Examination,**  
**May 2022**

**Subject: Advanced Pharmacognosy – I**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions.**

**(5 x 15 = 75 Marks)**

- 1 Discuss the role of pharmacognosy in herbal drug industry.
- 2 (a) General method for isolation of marine compounds.  
(b) Marine toxins.
- 3 Write the source, chemical marker and medical uses and health benefits of  
(a) Ginseng  
(b) Flax seed
- 4 Write about  
(a) Digestive enzymes  
(b) Health drinks of natural source
- 5 What are resins and flavonoids and write the source, structure, method of isolation and medical uses and health benefits of Guggul lipids and Rutin.
- 6 Write the spontaneous reporting scheme for bio drug adverse reactions.
- 7 Write a note on  
(a) Dietary fibres  
(b) Taxol
- 8 Write about WHO and AYUSH guidelines for safety monitoring of herbal drugs.

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**FACULTY OF PHARMACY**  
**M. Pharmacy I Semester (PCI) (Suppl) Examination, December 2021**  
**(COMMON TO ALL)**

**Subject: Modern Pharmaceutical Analytical Techniques**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any three questions. All questions carry equal marks.**  
**(3 x 25 = 75 Marks)**

- 1 (a) State and explain Beer-Lambert's law. Add a note on the deviations from Beer's law.  
(b) Explain the electronic transitions in UV spectroscopy.
- 2 (a) Explain the principle and instrumentation of FTIR with a neat labelled diagram.  
(b) Explain the named advantages of FTIR.  
(c) What are the major differences between Dispersive instruments and FTIR?
- 3 (a) What is the principle of Fluorescence? Explain the radiative and non radiative pathways of relaxation.  
(b) Add a note on the factors affecting fluorescence.
- 4 (a) Explain NMR instrumentation with a diagram.  
(b) Briefly explain shielding and deshielding with suitable example.
- 5 (a) What is the principle of MS? With a neat labelled diagram briefly explain the components of MS instrumentation.
- 6 (a) Classify the ionization techniques in MS. Explain any three methods in detail.  
(b) Define Base Peak, molecular ion peak and metastable ion.
- 7 (a) Explain GC instrumentation with a labelled diagram.  
(b) What are the applications of HPLC?
- 8 (a) Explain the experimental set up required for capillary electrophoresis.  
(b) Describe the principle and application of ELISA.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Suppl.) Examination,  
December 2021**

**Subject: Phytochemistry**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any three questions. All questions carry equal marks.**

**(3 x 25 = 75 Marks)**

- 1 Discuss the chemistry of cardiac glycosides and describe the biosynthesis of Digitoxin.
- 2
  - a) Explain the selection and optimization of lead compounds.
  - b) Give an informative note on vinca alkaloids
- 3 Write about
  - a) Principle and applications of HPTLC
  - b) Instrumentation and applications of Flash chromatography
- 4 What are alkaloids? Classify. Give the sources, chemistry, chemical test, mechanism of action and biosynthesis of Quinine.
- 5 Give an informative note on
  - a) Artemisinin and analogs of Artemisinin
  - b) phases of clinical trials.
- 6 What is extraction and describe the types of extracts. Write the principle and applications of extraction techniques in phytochemical studies
7. Give the chemical structure, sources and elucidate the structure based on spectral data
  - a) Menthol                      b) Caffeine                      c) Citral
8.
  - a) Discuss the stages of drug discovery process
  - b) Write about the importance of Radio tracer techniques

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Suppl.) Examination,  
December 2021**

**Subject: Advanced Pharmacognosy – I**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any three questions. All questions carry equal marks.  
(3 x 25 = 75 Marks)**

- 1 Write about current good cultivation practices for medicinal plants.
- 2 Write a note on recent advances in research on marine drugs.
- 3 Write the source, name of the marker, chemistry, medical uses and health benefits of (a) Ginseng (b) Flax seed.
- 4 Write a note on (a) Dietary fibers (b) Soya bean
- 5 What is pharmacovigilance and add a note on pharmacovigilance of herbal drugs.
- 6 Write short notes on (a) Garlic (b) FSSAI guide lines on nutraceuticals.
- 7 Write the source, isolation, chemical nature, medical uses and health benefits of (a) Taxol (b) Quercetin.
- 8 Discuss about Ex-situ methods for conservation of medicinal plants.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I - Semester (PCI)(Suppl.) Examination,  
December 2021**

**Subject: Industrial Pharmacognostical Technology**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any three questions.**

**(3 x 25 = 75 Marks)**

- 1 Explain the regulatory requirements and infrastructural facilities to establish the herbal drug industry of various dosage forms
- 2 a) Discuss the challenges in manufacturing and standardisation of herbal formulations.  
b) Give an informative note on EXIM policy
- 3 Write about  
a) India Pharmacopoeia    b) Ayurvedic Pharmacopoeia    c) TRIPS
- 4 Discuss in detail about the WHO guidelines in assessment of quality of herbal drugs
- 5 Write the importance of stability studies. Describe the methods of stability testing of natural products.
- 6 Define the terms IPR and Patent. Explain the procedure of Indian patent filling, processing and grant of patent
- 7 Give an informative note on  
a) Patent search and literature  
b) Geographical indication  
c) Rights and gains of patentee
- 8 a) Define the terms Quality assurance, quality control, TQM  
b) Describe the Good laboratory practices of Herbal industry.

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**FACULTY OF PHARMACY**  
**M.Pharmacy I Semester (PCI) (Main & Backlog) Examination, July 2021**  
**(COMMON TO ALL)**

**Subject: Modern Pharmaceutical Analytical Techniques**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any three from the following questions.**

**(3 x 25 = 75 Marks)**

- 1 (a) With a neat labelled diagram explain UV/Visible instrumentation.  
(b) Briefly explain the electronic transitions with examples.
- 2 (a) Explain the molecular vibrations in IR.  
(b) Write the sampling methods in IR spectroscopy.
- 3 (a) Explain the principle of flame photometry.  
(b) With a diagram explain the instrumentation for flame photometry.  
(c) List some metals that can be analysed by flame photometry.
- 4 (a) Explain the principle of proton NMR spectroscopy.  
(b) What is the significance of chemical shift? What are the factors affecting chemical shift?  
(c) What is the internal standard used in NMR spectroscopy? Why it is selected as internal standard?
- 5 (a) List and explain the steps in MS.  
(b) What are the mass analysers used in MS? Explain any two in detail.
- 6 (a) Explain HPLC instrumentation with a labelled diagram.  
(b) List and explain any 2 GC detectors.
- 7 (a) Explain Bragg's equation and derive the equation.  
(b) Explain the principle and the materials required for Paper electrophoresis.
- 8 (a) Explain the principle and types of RIA?  
(b) Briefly explain Zone electrophoresis and Moving boundary electrophoresis.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Semester (Main & Backlog)**

**Examination, July 2021**

**Subject: Phytochemistry**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any Three Questions.**

**(3 x 25 = 75 Marks)**

- 1 a) What is chromatography? Describe the principle, instrumentation and application of HPLC  
b) Write the applications of GCMS
- 2 a) What are the basic metabolic pathways? Describe the role of tracer techniques in biosynthetic investigations  
b) Give an informative note on Taxol.
3. Discuss the stages of drug discovery. Describe the selection and optimization of lead molecule
- 4 a) What is extraction? Describe the types of extracts. Describe the applications of extraction techniques.  
b) Write a note on selection of solvent extraction technique.
- 5 Give the biological source, chemical structure and elucidate the structure by spectral data  
a) Menthol                      b) Nicotine                      c) Caffeine
- 6 What are alkaloids? Classify. Give the sources, chemistry, and chemical test, mechanism of action and biosynthesis of quinine
- 7 Give an informative note on  
a) Application of HPTLC  
b) LC/MS  
c) Flash chromatography
- 8 a) What are the regulatory requirements of clinical studies? Discuss the phases of clinical trials.  
b) Write the chemistry and mechanism action of Artemesin.

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**FACULTY OF PHARMACY**  
**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Main & Backlog)**  
**Examination, July 2021**

**Subject: Advanced Pharmacognosy – I**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any three questions.**

**(3 x 25 = 75 Marks)**

- 1 Write a note on good agricultural practices on medicinal plants.
- 2 Explain the following:  
(a) General methods for isolation of marine natural products.  
(b) Marine toxins
- 3 Write the source, isolation, chemical nature, medical uses and health benefits of (a) Vascine (b) Shatavarins.
- 4 Write the source, name of the marker, chemistry, medical uses and health benefits of (A) Garlic (b) Ginseng.
- 5 Write the protocol for spontaneous reporting scheme on Bio drug adverse reactions.
- 6 Explain the following:  
(a) Isolation of Beta carotene.  
(b) Dietary fibers
- 7 Give a detailed note on the following:  
(a) FSSAI guidelines  
(b) Antioxidants
- 8 Write the source, structure, medical uses and health benefits of  
(a) Omega 3 fatty acids  
(b) Tocopherol

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Semester (PCI)(Main & Backlog)**

**Examination, August 2021**

**Subject : Industrial Pharmacognostical Technology**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any Three Questions.**

**(3 x 25 = 75 Marks)**

- 1 a) Define the terms Patent and IPR. Describe the objectives of patent act  
b) Write the rights and gains of patentee  
c) Write a note on geographical indication
- 2 Discuss in detail about the objectives, concepts and advantages of Good manufacturing practices.
- 3 a) Write the infrastructural facilities required for production of tablets and herbal extracts  
b) Write about the challenges in upgrading modernization of herbal formulation
- 4 Write the problems in standardization of herbal medicines and discuss in detail about the WHO guidelines in quality assessment of herbal drugs.
- 5 Write about  
a) Clinical laboratory testing  
b) Ayurvedic Pharmacopoeia  
c) Patent laws applicable to herbal drugs
- 6 Give an informative note on  
a) EXIM policy  
b) TRIPS
- 7 What is the importance and objective of stability studies? Explain the methods of stability testing of natural products.
- 8 a) Give an informative note on Copyright  
b) Explain the procedure of Indian patent filling

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognocny) I – Semester (PCI) (Suppl.) Examination,  
October 2020**

**Subject: Advanced Pharmacognosy – I**

**Time: 2 Hours**

**Max.Marks:75**

**Note: Answer any three questions.**

**(3x25=75 Marks)**

1. Discuss in detail about different methods for conservation of Medicinal plants.
2. Write a note on
  - a) Marine toxins
  - b) General methods for isolation of marine natural products.
3. Write the source, name of the marker, chemistry, health benefits and uses of
  - a) Ginseng
  - b) Flax seed
4. Write the source, isolation, chemistry, health benefits and medical uses of
  - a) Taxol
  - b) Guggul Lipids
5. Write the spontaneous reporting scheme for Biodrug adverse reactions.
6. Write about good cultivation and collection practices for medicinal plants.
7.
  - a) Write the source, structure, isolation and uses of vascine.
  - b) Health drinks of natural origin.
8. Write short notes on
  - a) Poly unsaturated fatty acids.
  - b) Formulation of Naturaceuticals.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Suppl.) Examination,**

**October 2020**

**Subject: Advanced Pharmaceutical Analysis**

**Time: 2 hours**

**Max. Marks: 75**

**Note: Answer any three questions.**

**(3x25=75 Marks)**

1. a) Define impurity and give the classification of impurities in new drug substances.  
b) Explain the guidelines for reporting and control of elemental impurities in new drug products.
2. Describe accelerated stability studies and shelf life calculation of drug products.
3. a) Explain the factors affecting stability of drug substances and drug products.  
b) How do you perform photo stability of formulations?
4. a) Describe different analytical techniques used in characterization of degradants.  
b) What is impurity profiling and give its importance in testing of pharmaceuticals.
5. a) Write short notes on HPTLC finger printing in stability testing of phytopharmaceuticals.  
b) Give the regulatory requirements for stability testing of phytopharmaceuticals.
6. Write about the following  
a) Enzyme immunoassay  
b) Optical Immunoassay
7. a) Describe the principle and procedure involved in the biological assay of oxytocin.  
b) What are antitoxins? Give biological assay of Tetanus antitoxin.
8. Write the principle, procedure and applications of PCR studies.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmaceutical Chemistry) I-Semester (PCI) (Suppl.) Examination,**

**October 2020**

**Subject: Advanced Chemistry of Natural Products**

**Time: 2 hours**

**Max. Marks: 75**

**Note: Answer any three questions.**

**(3x25=75 Marks)**

- 1 (a) Discuss the development of CNS drugs using the natural products as lead compounds.  
(b) Explain the structural modifications of Reserpine with their therapeutic uses.
- 2 (a) Discuss the general methods for the structure elucidation of alkaloids.  
(b) Write a note on morphine antagonists.
- 3 (a) Write in brief the structural elucidation of cholesterol.  
(b) Write a note on nomenclature and stereochemistry of steroids.
- 4 (a) Discuss chemistry of insulin.  
(b) Discuss the general methods for the synthesis of peptides.
- 5 (a) Describe the structures and therapeutic uses of antifertility agents. Mention their mechanism of action.  
(b) Give the mechanism of action, synthetic analogues and therapeutic uses of Taxol.
- 6 (a) Write in brief the structural elucidation of morphine.  
(b) Discuss the development of morphine analogues.
- 7 (a) Explain the general analysis of peptides and proteins  
(b) Write the structures and therapeutic uses of synthetic analogues of vinca alkaloids.
- 8 (a) Discuss the development of antibiotics from natural products lead compounds.  
(b) Explain the primary, secondary, tertiary and quaternary structure of proteins.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmaceutical Chemistry) I Semester (PCI) (Suppl.)**

**Examination, November 2020**

**Subject : Chemistry of Natural Products**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any Three questions.**

**(3 x25=75 Marks)**

1. Write how the natural products acts as a leads in the following classes of drugs
  - a) Anticancer drugs
  - b) Macrolide &  $\beta$  - lactam antibiotics
2.
  - a) Discuss the structural elucidation and stereochemistry of Ephedrine.
  - b) What are the alkaloids and classify alkaloids with one example for each class.
3.
  - a) Write the general methods for the structural elucidation of flavonoids.
  - b) Write the structural elucidation of quercetin.
4.
  - a) Write the classification, general methods of structural elucidation of Terpenoids.
  - b) Write the structural elucidation of camphor.
5.
  - a) Discuss the chemistry & physiological significance of following vitamins
    - i) Vitamin - A
    - ii) Vitamin - C
    - iii) Vitamin - E
  - b) Discuss about r DNA technology
6. Write a note on
  - a) Chemistry of cardiac glycosides
  - b) Chemistry of Contraceptive agents
  - c) Isoprene rule and Special isoprene rule
7. Write down the active constituents (minimum three from each crude drug) present in the following crude drugs with structures.
  - i) Curcuma longa
  - ii) Pterocarpus marsupium
  - iii) Gymnema sylvestre
  - iv) Phyllanthus niruri
  - v) Swertia chirata
8. Write the structural characterization of following compounds using IR,  $H^1NMR$ ,  $C^{13}NMR$  and Mass spectral data (Write approximate values)
  - i) Quercetin
  - ii) Vitamin D
  - iii) Digoxin
  - iv) Camphor
  - v) Pencillin G

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Suppl.)**

**Examination, November 2020**

**Subject : Industrial Pharmacognostical Technology**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any Three questions.**

**(3 x25=75 Marks)**

1. a) Write the licensing procedure for herbal industry.  
b) Discuss the layout, infrastructure for the production and standardization of herbal products
2. a) Give an informative note of EXIM policy  
b) Write about TRIPS.
3. a) Write the monograph of Ashwagandha and digitalis  
b) Write the features of Indian Pharmacopoeia.
4. Explain the WHO guidelines in quality assessment of herbal drugs.
5. a) Write a note on Total quality management  
b) Discuss the clinical laboratory testing of Herbal drugs.
6. a) What is patent? Describe the objective of patent act  
b) Explain the stages of patent filling, processing and grant of patent.
7. a) Write about the process of opposition and revocation of patent.  
b) Discuss about the copy right act.
8. Write the importance of stability studies. Discuss the various methods of stability studies.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I- Sem. (PCI) (Suppl.)**

**Examination, November 2020**

**Subject: Phytochemistry**

**Time: 2 Hours**

**Max. Marks: 75**

**Note: Answer any Three questions.**

**(3 x25=75 Marks)**

1. a) Discuss the various stages of clinical trials.  
b) Explain the principle and technique of SCFE.
2. a) What are steroids and describe the structural features and color tests steroids.  
b) Give the source and biosynthesis scheme of Digitoxin.
3. a) Describe the methods of drug discovery.  
b) Write about the selection and optimization of lead compounds.
4. a) Discuss the sources, chemistry and mechanism action of artemesin.  
b) Write the chemical structure and isolation process of quinine and sennosides.
5. Describe the types of extracts and discuss the principles and methods of extractive techniques.
6. Write about
  - i) Bioguided extraction technique.
  - ii) Flash chromatography
  - iii) Vinca alkaloids.
7. Write the sources and elucidate the structures using spectroscopic characters.  
a)Menthol      b) Nicotine    c) Caffeine
8. a) Give an informative note on Radio tracing technique.  
b) What are alkaloids? Write the properties, color reactions and general methods of extraction of alkaloids.

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**FACULTY OF PHARMACY**

**M. Pharmacy I – Semester (Main & Backlog) Examination, January 2020**  
**(Common Paper for all Except Pharmacy Practice)**

**Subject : Modern Pharmaceutical Analytical Techniques**

**Time: 3 Hours**

**Max. Marks: 75**

**Note:** Answer any Five Questions. All Questions Carry Equal Marks.

1. (a) State and explain Beer- Lambert's law. Add a note on the deviations from Beer's law. 8  
 (b) Explain solvents and the selection criteria for UV/Visible spectroscopy. 4  
 (c) What is solvent shift? 3
2. (a) Explain the principle and instrumentation of FTIR with a neat labelled diagram. 8  
 (b) Explain about the sampling techniques and applications of FR spectroscopy 7
3. (a) What is the principle of Fluorescence? Explain the radiative and non radiative pathways of relaxation. 7  
 (b) Add a note on the factors affecting fluorescence and quenchers in fluorescence. 6  
 (c) What are the criteria for a molecule to exhibit the phenomena of fluorescence 2
4. (a) Explain the principle of proton NMR spectroscopy. 5  
 (b) What is the significance of chemical shift. What are the factors affecting chemical shift ? 6  
 (c) Explain about spin-spin crippling and it's importance in NMR 4
5. (a) Classify the ionization techniques in MS. Explain any three methods in detail. 12  
 (b) Differentiate between Base peak and molecular ion peak. 3
6. (a) Explain HPLC instrumentation. 10  
 (b) What are the applications of HPLC? 5
7. (a) Explain Braggs equation and derive the equation. 8  
 (b) What is the principle involved in rotating crystal technique? 7
8. Explain the principle, working and applications of  
 (a) Capillary electrophoresis 7<sup>1/2</sup>  
 (b) Gel electrophoresis 7<sup>1/2</sup>

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**FACULTY OF PHARMACY****M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Main & Backlog) Examination,  
February 2020****Subject: Advanced Pharmacognosy – I****Time: 3 Hours****Max.Marks:75****Note: Answer any five questions. All questions carry equal marks.**

- 1 Write short notes on :
  - a) Indian Council of Agricultural Research . 8
  - b) Importance of Pharmacognosy in Herbal drug industry. 7
- 2 Write about
  - a) General methods for isolation of marine natural products and their problems in taxonomical identification. 10
  - b) Marine toxins 5
- 3 Write a note on
  - a) Antioxidants 10
  - b) Cereals and Grains 5
- 4 Write the source, name of the marker, chemistry, health benefits and uses of
  - a) Ginseng                      b) Flax seed 8+7
- 5 Write the source, isolation, chemistry, health benefits and uses of
  - a)  $\beta$ -Carotene                      b) Taxol 9+6
- 6 Write about WHO and AYUSH guidelines for safety monitoring of herbal drugs. 15
- 7 Write short notes on
  - a) Dietary fibers 9
  - b) Digestive enzymes 6
- 8
  - a) Write the source, structure, isolation, health benefits and users of RESVERATROL. 10
  - b) Write the source, structure and function omega-3-fatty acids. 5

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Sem. (PCI) (Main & Backlog) Examination,  
January 2020**

**Subject: Industrial Pharmacognostical Technology**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five Questions. All Questions carry Equal Marks**

- 1 a) What is patent? Describe the objective of patent act. 5+10  
b) Explain the stages of patent filling, processing and grant of patent.
- 2 Write about 5+5+5  
a) Geographical indication  
b) Opposition and revocation of patents.  
c) EXIM policy
- 3 Discuss the problems in standardization of herbal drugs and discuss the WHO guidelines in Quality assessment of herbal drugs 15
- 4 Write the importance of stability studies. Discuss the various methods of stability studies. 15
- 5 Give an informative note on  
a) TRIPS 7  
b) Copy rights 8
- 6 a) Discuss the scope of herbal drug research and manufacturing of herbal drugs in India. 10  
b) Write about the general features of Indian Pharmacopoeia. 5
- 7 Discuss in detail about Good laboratory practices in Herbal Industry. 15
- 8 a) Write the licensing procedure for herbal industry. 3  
b) Discuss the layout, infrastructure for the production and standardization of herbal products. 12

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Main & Backlog) Examination,  
January 2020**

**Subject: Phytochemistry**

**Time: 3 hours**

**Max. Marks: 75**

**Note: Answer any five Questions. All Questions carry equal marks.**

- 1 a) Explain the concept of Radio tracing technique and methods to detect the radioactive tracers in biosynthetic studies.  
b) Give the isolation and structural features of quinine. 10+5
- 2 a) Describe the methods of drug discovery and explain the lead optimization.  
b) Write a note on artemesin. 10+5
- 3 Give an informative note on 5+5+5  
a) Andrographolides b) Withanolides c) Guggulsterone
- 4 Describe the types of extracts and discuss the principles and methods of extractive technique. 15
- 5 a) Discuss the phases of clinical trials. 8+7  
b) Explain the principles, instrument and application of flash chromatography.
- 6 Describe the structural features and elucidate the structures using spectroscopic characters for 7+8  
a) Menthol b) Nicotine
- 7 Discuss the principle, techniques and application of HPTLC technique. 15
- 8 Give the source, structural features and Biosynthesis of Digitoxin. 15

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**FACULTY OF PHARMACY**

**M. Pharmacy (Common paper for all Specialization) I-Semester (PCI) (Suppl.)**  
**Examination, August 2019**

**Subject : Modern Pharmaceutical Analytical Techniques**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- |  |    |
|--|----|
| 1. a) Write Beer-Lambert's law and derive the expression   | 5  |
| b) Mention the different methods of quantitative analysis by uv-visible spectroscopy. Explain any one method in detail.                                      | 10 |
| 2. a) Explain the interpretation procedure of IR spectra of different organic compounds in detail. With examples of schematic IR spectra.                    |    |
| b) What is fluorescence? Write the factors affecting fluorescence.   | 5  |
| 3. a) What is chemical shift? Write the factors influencing chemical shift?  | 8  |
| b) Write a note on FT-NMR  | 7  |
| 4. a) Explain the instrumentations and working of mass spectrometer with schematic diagram.  | 8  |
| b) Write the fragmentation patterns of different organic compounds observed in mass spectroscopy. With the help of schematic mass spectra of a few compounds | 7  |
| 5. Describe the components and working procedure of HPLC with a neat labeled block diagram.  | 15 |
| 6. a) Write the principle, instrumentation and working of zone electrophoresis.  | 8  |
| b) Write the principle and theory of X-ray diffraction study using Brag's law  | 7  |
| 7. a) Write the principle and instrumentation of flame photometry  | 7  |
| b) Write notes on any two GC detectors   | 8  |
| 8. Explain the principle, equipment, procedure, advantages and applications of IR Spectrophotometer  | 15 |

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Suppl.) Examination, August 2019**

**Subject: Industrial Pharmacognostical Technology**

**Time: 3 Hours**

**Max.Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- 1 Write the importance of stability studies and describe the methods to determine the stability testing of natural products. 15
- 2 a) Write objectives and advantages of EXIM policy and TRIPS. 10+5  
b) Give an informative note on Indian Pharmacopeia.
- 3 a) Define the terms Quality assurance, Quality control and TQM. 5+10  
b) Describe the GMP concepts in Herbal industry.
- 4 a) Discuss the regulatory requirements of Herbal Industry. 5+10  
b) Write the challenges in standardization and manufacturing of herbal drugs.
- 5 List the phases of clinical trials and describe each step. 15
- 6 a) Discuss the definition, objective and benefits of patent act. 5+10  
b) Explain the process of patent filling in India.
- 7 Describe in detail about WHO guideline in quality assessment of herbal drugs. 15
- 8 a) Give an informative note on geographical indication. 7+8  
b) Copyright act.

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Suppl.) Examination,  
Aug. 2019**

**Subject: Advanced Pharmacognosy – I**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

1. Discuss the role of Pharmacognosy in Herbal drug industry
2. a) Write General method for isolation of marine natural products  
b) Discuss the pharmacovigilance of herbal drugs
3. Write the source, name of the marker, chemistry, medical uses and health benefits of
  - a) Soya bean
  - b) Green tea
4. Write the source, isolation, chemical nature, medical uses and health benefits of
  - a) Taxol
  - b) Beta carotene
5. Write the protocol for spontaneous reporting scheme on Bio drug adverse reactions
6. a) Write a note on Isolation of Vaccine    b) Dietary fibers
7. Write the formulation and evaluation of any three popularly used nutraceutical products
8. Write the source, structure, medical uses and health benefits of
  - a) Hesperidins
  - b) Curcumin

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacology) - I Semester (PCI) (Suppl.) Examination Aug. 2019**

**Subject: Advanced Pharmacology-I**

**Time: 3 Hours**

**Max.Marks:75**

Note: Answer any **five** questions. All questions carry equal marks.

1. a) Write a note on drug distribution.  
b) Describe the role of G-Proteins in drug action.
2. a) Discuss the steps involved in neurotransmission.  
b) Explain in brief about role of histamine transmission in CNS.
3. a) Classify anti-psychotic agents. Write in brief about atypical anti-psychotics.  
b) Write a note on d-Tubocurarine.
4. a) Classify anti-ischemic agents. Write the pharmacology of organic nitrates.  
b) Write a note on calcium channel blockers.
5. a) Write a note on thromboxane-A<sub>2</sub> and cetirizine.  
b) Write a note on serotonin.
6. a) Explain in brief about elimination and concept of linear pharmacokinetic.  
b) Write the physiological role of nuclear receptors.
7. a) Describe the pharmacology of adrenaline.  
b) Write a note on sodium valproate and lithium carbonate.
8. a) Explain about the haematinics  
b) Write a note on 5-HT antagonists.

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**FACULTY OF PHARMACY****M. Pharmacy (Common Paper for all Specialization) I – Semester****(Main & Backlog) Examination, January 2019****Subject : Modern Pharmaceutical Analytical Techniques****Time: 3 Hours****Max. Marks: 75****Note:** Answer any Five Questions. All Questions Carry Equal Marks.

- |  |     |
|--|-----|
| 1) a) With a neat labeled diagram explain UV/Visible instrumentation.  | 8   |
| b) Briefly explain the electronic transitions with examples  | 8   |
| 2) a) Explain the factors affecting vibrational frequencies in IR.   | 8   |
| (b) Write the sampling methods in IR spectroscopy.   | 7   |
| 3 (a) Briefly explain the source of AAS.   | 8   |
| (b) List and explain the interferences.  | 5   |
| (c) List some metals that can be analysed by AAS.  | 2   |
| 4 (a) Explain NMR instrumentation.   | 8   |
| (b) Briefly explain spin-spin coupling with a suitable example.  | 7   |
| 5 (a) What is the principle of MS. With a neat labelled diagram briefly explain the components of MS instrumentation.                        | 8   |
| (b) Explain Quadrupole and time of flight analysers in detail.   | 7   |
| 6. (a) What are the column efficiency parameters?  | 7   |
| (b) List and explain any 2 GC detectors.   | 8   |
| 7. Explain the principle and application of capillary electrophoresis. Give a labelled diagram to indicate the components of the instrument. |     |
| 8 (a) Discuss the principle, instrumentation working and application of  |     |
| a. Paper electrophoresis   |     |
| b. Gel electrophoresis   | 7+8 |

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Main & Backlog) Examination,  
February 2019**

**Subject: Industrial Pharmacognostical Technology**

**Time: 3 Hours**

**Max.Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- 1 Describe the problems in standardization of herbal drugs. Explain the WHO guidelines in quality assessment of herbal drugs. 15
- 2 Give an informative note on: 7+8
  - a) EXIM policy
  - b) Stability testing of natural products
- 3
  - a) Describe the definition, objective and benefits of patent act. 5+10
  - b) Explain the process of patent filling in India.
- 4
  - a) Write the objective, advantages, and procedures of copyright act. 10+5
  - b) Give an informative note on Ayurvedic Pharmacopoeia.
- 5 Write a note on
  - a) Patent search and literature
  - b) TRIPS
  - c) Challenges in manufacturing of herbal drugs. 5+5+5
- 6 Explain the concepts of Quality assurance in herbal industry and describe the GLP aspects in herbal industry. 15
- 7
  - a) Write the monographs of Ergot.
  - b) Discuss the process of opposition and revocation of a patent. 10+5
- 8
  - a) Write about the regulatory requirements for Herbal Industry.
  - b) Discuss the infrastructure requirements for the production and standardization of herbal tablets and Ointment. 5+10

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Main & Backlog) Examination,  
February 2019**

**Subject: Phytochemistry**

**Time: 3 Hours**

**Max.Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- 1 a) Explain the concept of Bioguided extraction technique.  
b) Describe the Super critical extraction technique with advantage and disadvantages.  
c) Explain the spectral characters of Menthol. 5+5+5
- 2 a) Write the applications of HPTLC, LCMS and GCMS.  
b) Discuss the chemistry of Artemesin. 10+5
- 3 Give the sources, structures and isolation of Sennosides and piperine. 15
- 4 a) Discuss the role of herbs as a source of drugs in drug discovery process.  
b) Explain the selection and optimization of lead compounds. 7+8
- 5 a) Define the extraction and types of extracts.  
b) Write the principle of extraction and discuss the methods of various extraction Techniques. 5+10
- 6 a) List the basic metabolic pathways and explain the shikmic acid pathway.  
b) Define and classify the steroids. 10+5
- 7 Give an informative note on  
a) Phases of clinical trials.  
b) HPTLC 8+7
- 8 Describe the structural features and spectral characters of Nicotine, Citral and luteolin. 15

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**FACULTY OF PHARMACY**

**M. Pharmacy (Pharmacognosy) I – Semester (PCI) (Main & Backlog) Examination,  
January 2019**

**Subject: Advanced Pharmacognosy-I**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

1. Write about current good agricultural practices for medicinal plants. 15
2. Write short notes on : 8+7
  - a) Marine toxins
  - b) Isolation of marine natural products
3. Write the source, name of the marker, chemistry, medical uses and health benefits of : 7+8
  - a) Green Tea
  - b) Flax seed
4. Write a note on : 10+5
  - a) Digestive enzymes
  - b) Soya bean
5. What is pharmaco vigilance and add a note on pharmaco vigilance of herbal drugs. 15
6. Write shot notes on: 9+6
  - a) Antioxidants
  - b) FSSAI guide lines on nutraceuticals
7. Write the source, isolation, chemical nature, medical uses and health benefits of 9+6
  - a) Vaccine
  - b) Rutin
8. Discuss about In-situ and Ex-situ conservation of medicinal plants 15

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**FACULTY OF PHARMACY****M. Pharmacy (Common to All) I-Semester (PCI) (Suppl.) Examination,****August 2018****Subject: Modern Pharmaceutical Analytical Techniques****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Discuss the instrumentation of double beam UV visible spectrophotometer with a neat labeled diagram. (10)  
(b) What is Isobestic point? Explain with a labeled UV spectrum giving two examples. (5)
- 2 (a) Compare the instrumentation and working of a dispersive and Fourier transform IR spectrometers. Write the advantages and disadvantages of the two techniques. (10)  
(b) Draw a schematic IR spectrum for any one compound and indicate the absorption wave number regions for any four functional groups in the compound. (5)
- 3 (a) Explain  
(i) Chemical shift and factors influencing chemical shift. (6)  
(ii) Spin-spin coupling and coupling constant. (6)  
(b) Draw a schematic <sup>1</sup>H NMR spectrum for any one compound and explain the following:  
(i) Chemical shift values (ii) Nature of protons (iii) Number of protons (3)
- 4 (a) Discuss the theory and principle of mass spectroscopy and explain the instrumentation and working of mass spectrometer with a neat labeled diagram. (10)  
(b) What is fragmentation? Explain the following by taking a simple example  
(i) Fragmentation peaks (ii) Molecular ion peak (iii) Base peak (5)
- 5 (a) Discuss the theory of HPLC. Describe the instrumentation and working of HPLC with a neat labeled diagram. (10)  
(b) Draw a schematic HPLC chromatogram and explain  
(i) Retention time (ii) Resolution (iii) Peak Asymmetry (5)
- 6 (a) Discuss the theory and principle of electrophoresis. Explain the method of capillary electrophoresis and its applications with examples. (12)  
(b) What is isoelectric focusing? (3)
- 7 (a) Discuss the theory and principle of Gas chromatography. Explain the instrumentation and working of Gas chromatography and explain various stationary and mobile phases used in GC. (11)  
(b) How non-volatile compounds can be analysed by GC. Explain the technique with few examples? (4)
- 8 Write a note on :  
(a) Flame emission spectroscopy. (6)  
(b) Instrumentation and application of Fluorescence spectroscopy (9)

**FACULTY OF PHARMACY**  
**M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Suupl.) Examination,**  
**August 2018**

**Subject: Advanced Pharmacognosy-I**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

- 1 Discuss about In-Situ & Ex-Situ methods for conservation of medicinal plants. 15
- 2 Discuss about general method of isolation of marine natural products and add a short note on marine toxins. 7+8
- 3 Write the protocol for spontaneous reporting scheme on Bio-drug adverse reactions. 15
- 4 Write the source, name of the marker, chemistry, medical and health benefits of
  - a) Ginseng
  - b) Spirulina7+8
- 5 Write the source, method of isolation, chemical nature, medical and health benefits of
  - a) Resveratrol
  - b) Guggul lipids7+8
- 6
  - a) Write a note on Pharmacovigilance of herbal drugs. 8+7
  - b) Polyunsaturated fatty acids
- 7
  - a) Write the source, method of isolation, chemical nature, medical and health benefits of Taxol
  - b) Dietary fibers 8+7
- 8
  - a) Discuss the importance of Pharmacognosy in herbal drug industry
  - b) Regulatory aspects of Nutraceuticals 10+5

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**FACULTY OF PHARMACY****M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Suppl.) Examination, August 2018****Subject: Phytochemistry****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 Write the definition and principles of extraction and types of extracts. Describe various extraction techniques with principles, merits and demerits. 15
- 2 Explain the instrumental technique and applications of 7+7
  - (i) Super critical Fluid extraction technique.
  - (ii) HPTLC
- 3 (a) Describe the concept of tracer technique and discuss the methods of detectors used in tracer technique. 10+5
  - (b) Write the chemistry of Glycyrrhizin.
- 4 (a) Discuss the importance of natural products in discovery of drugs. 7+7
  - (b) Explain the selection of lead structure and optimization.
- 5 Give the source, spectral characters and structural elucidation of Caffeine. 15
- 6 Write about 5+5+5
  - (i) Biosynthesis of sennosides.
  - (ii) Phases of clinical studies
  - (iii) Chemistry of artemesin.
- 7 Give the source, Chemical structure and isolation of 5+5+5
  - (i) Piperine (ii) Quinine (iii) Caffeine
- 8 Write the sources, chemistry and mechanism of action of 5+5+5
  - (i) Digitoxin (ii) Vinca alkaloids (iii) Taxol

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**FACULTY OF PHARMACY****M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Suuple.) Examination, August 2018****Subject: Industrial Pharmacognostical Technology****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Define the term Quality assurance, Quality analysis and Quality management.  
(b) Write in detail about the Good manufacturing practices in Herbal Industry. 7+7
- 2 Explain the WHO guidelines in quality assessment of herbal drugs. 15
- 3 (a) Explain the importance of stability and stability studies.  
(b) Describe the different methods of stability studies. 5+10
- 4 Write the definition, objective and procedure of patent filling India. Write note rights of patentee. 15
- 5 Give informative note on  
(i) Copyrights  
(ii) Good storage practices. 7+7
- 6 (a) Write the objectives, functions and benefits of TRIPS.  
(b) Write detailed note on EXIM policy. 7+7
- 7 Write about  
(a) Indian pharmacopoeia.  
(b) Pilot plant scale up technique.  
(c) Geographical indication. 5+5+5
- 8 Write the IP monograph of  
(a) Degitalis (b) Ergot. 7+7

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**FACULTY OF PHARMACY**

**M. Pharmacy (Common to All) I-Semester (PCI) (Main) Examination,  
February 2018**

**Subject: Modern Pharmaceutical Analytical Techniques****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Derive the expression for Beer-Lambert law and explain the deviations with examples. (9)  
(b) Explain the solvent effect with examples. (3)  
(c) Discuss about the principle and functions of monochromators in UV spectrophotometer. (3)
- 2 (a) Draw schematic IR spectrum for any one compound and indicate the absorption wave numbers regions for any four functional group in the compound. (5)  
(b) Explain various kinds of IR vibrational modes and their energy levels. (5)  
(c) Explain the sampling methods for liquids and solid samples for taking IR spectra. (5)
- 3 (a) Explain the principle and instrumentation of NMR spectroscopy. (10)  
(b) Draw a schematic HNMR spectrum for any one simple compound and explain the following (5)  
(i) Chemical shift values (ii) Nature of protons (iii) Number of protons
- 4 (a) Explain about the ionisation techniques – electron impact, chemical ionisation, FAB and MALDI and their advantages and disadvantages. (12)  
(b) What are isotopic peaks and how they are identified. What is the importance of isotopic peaks? (3)
- 5 (a) Discuss the theory of HPLC. Describe the instrumentation and working of HPLC with the help of a neat labeled diagram. (10)  
(b) Draw a schematic HPLC chromatogram and explain (i) Resolution, (ii) tailing (iii) peak symmetry (5)
- 6 (a) Discuss the theory and principle of electrophoresis. Explain the method of gel electrophoresis and its applications with examples. (12)  
(b) What is isoelectric focusing? (3)
- 7 (a) Discuss about various types of detectors used in gas chromatography. (11)  
(b) Explain about moving boundary electrophoresis with required labeled diagram. (4)
- 8 Write a note on : (6)  
(a) Emission spectroscopy (9)  
(b) Instrumentation and application of fluorescence spectroscopy

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**FACULTY OF PHARMACY****M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Main) Examination, February 2018****Subject: Phytochemistry****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Write the chemistry, biosynthesis, mechanism of action and chemical tests for Digitoxin.  
(b) Write the chemistry and analogs of artemesin. 10+5
- 2 Write about the chemistry of  
(i) Quinine  
(ii) Withanolides  
(iii) Sennosides 5+5+5
- 3 (a) Define and write the selection and optimization of lead compounds in Drug Discovery with suitable examples. 10+5
- 4 Discuss spectral characters to elucidate the chemical structure of Menthol. 15
- 5 Write the source, chemical structure and method of isolation of  
i) Quinine ii) Sennosides iii) Piperine. 5+5+5
- 6 Write a note  
(i) Phases of clinical trials (7½)  
(ii) Applications of HPTLC (7½)
- 7 Define and describe different types of extraction and extract techniques with advantages and disadvantages of each technique. 15
- 8 Explain the principle, instrumentation, detectors and applications of HPTLC. 15

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**FACULTY OF PHARMACY****M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Main) Examination, February 2018****Subject: Advanced Pharmacognosy - I****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 Write the protocol for spontaneous reporting scheme on Bio-drug adverse reactions. 15
- 2 Discuss about current good cultivation practices for medicinal plants. 15
- 3 Write a note on:  
a) Anti-oxidants  
b) Dietary fibers 8+7
- 4 Write the source, name of the marker, chemistry, medical and health benefits of  
a) Soya  
b) Ginseng 8+7
- 5 Write the source, method of isolation, chemical nature, medical and health benefits of  
a) Flavanoids  
b)  $\beta$ -Carotene 8+7
- 6 a) Discuss about general method of isolation of marine natural products. 10+5  
b) Discuss the uncertainty about Taxonomical identification of marine drugs
- 7 Write a note on pharmacovigilance of herbal drugs. 15
- 8 a) Discuss the importance of Pharmacognosy in herbal drug industry. 9+6  
b) Discuss about Ex-Situ methods for conservation of medicinal plants

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**FACULTY OF PHARMACY****M. Pharmacy (Pharmacognosy) I-Semester (PCI) (Main) Examination, February 2018****Subject: Industrial Pharmacognostical Technology****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Describe the Regulatory requirements of Herbal drug Industry.  
(b) Write an informative note on Good laboratory practices in Herbal Industry. 7+7
- 2 (a) Explain the importance of stability and stability studies.  
(b) Describe the different methods of stability studies. 5+10
- 3 (a) Define the terms Quality assurance, Quality management and Quality control.  
(b) Give an informative note on TQM and GMP. 5+10
- 4 Write the definition, objective and procedure of patent filling in India. Write a note rights of patentee. 15
- 5 Write about  
(a) Indian pharmacopoeia.  
(b) Ayurvedic pharmacopoeia  
(c) Herbal Pharmacopoeia 5+5+5
- 6 Describe the problems in standardization of herbal drugs. Explain the methods of WHO guidelines in quality assessment of herbal drugs. 15
- 7 (a) Write the objectives, functions and benefits of TRIPS.  
(b) Geographical indications. 7+7
- 8 Write the advantages and scope of Intellectual Property Rights. Describe in detail about Copyright. 15

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