THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LL 981] NOVEMBER 2017 **Sub. Code: 2981**

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-I
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262981

Time : Three hours **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) Explain the construction and working principle of Time of flight of mass analyzer.
   b) Explain in detail with examples the fragmentation pattern of organic compounds in mass spectroscopy.

2. a) Describe the principle and instrumentation of double beam Infrared Spectrophotometer.
   b) i) Mass spectrum of pentane produced a molecular ion peak at m/e 72. It also showed peaks at m/e 57, 43 and 29. Identify these possible fragments of pentane.
   ii) Mass spectrum of a molecule showed molecular ion peak and its isotopic peak in 1:1 ratio. What is the possibility of the atom present in the molecule?
   iii) The molar absorption co-efficient of tyrosine in water is 1280 M^{-1} cm^{-1} at 280nm. Calculate the concentration of tyrosine solution in water if the absorbance of the solution is 0.34 measured in a 1 cm path length cell.

II. Write notes on: **(7 x 5 = 35)**

1. Explain the different types of electronic transitions involved in UV Spectroscopy.
2. Discuss the principle and applications of X-ray diffraction method.
3. Write the principle and interferences of Flame Emission spectroscopy.
4. With examples, explain the relationship of chemical structure to fluorescence spectra.
5. Describe the principle and application of zone electrophoresis.
6. Discuss briefly about FAB and chemical ionization mass spectroscopy.
7. Explain the principle and instrumentation DSC.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LM 981] MAY 2018 **Sub. Code: 2981**

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-I
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

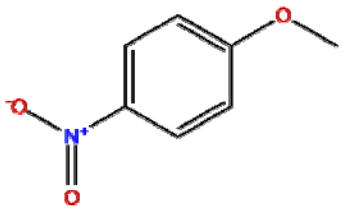
Q.P. Code : 262981

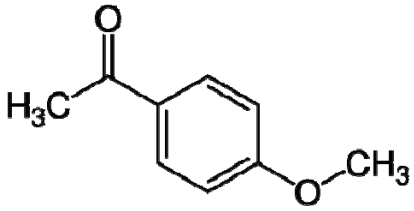
Time : Three hours **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) With a neat labeled diagram, explain the construction and working of double beam UV-Vis Spectrophotometer.
   b) Explain the principle and instrumentation of Nuclear magnetic spectroscopy.

2. a) Describe the principle and any two types of ionization methods of mass spectroscopy.
   b) i) Predict the approximate chemical shift positions of the protons of the following structures.





ii) Draw the possible structure for the compound (molecular formula C_3H_7Cl) that shows one doublet and one septet in proton NMR spectrum.

II. Write notes on: **(7 x 5 = 35)**

1. Write a note on ^{13}C-NMR and coupling constant.
2. Explain the application and various interferences occurring in Flame emission spectroscopy.
3. Classify Ion exchange, Ion exchangers used in Ion exchange chromatography. Enumerate the mechanism and factors affecting Ion exchange process.
4. Explain the sample handling techniques used in IR spectra.
5. Discuss the principle and factors affecting separation of paper electrophoresis.
6. Describe the theory of fluorescence with Jablonski diagram.
7. Write short notes on the principle and applications of potentiometry.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LN 981] NOVEMBER 2018 **Sub. Code: 2981**

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-I
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

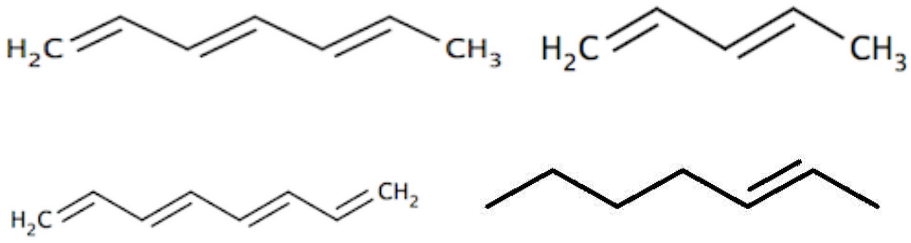
Q.P. Code : 262981

Time : Three hours **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) Describe the theory and factors affecting the measurement of fluorescence.
   b) With a neat diagram describe the instrumentation and applications of spectrofluorimeter.

2. a) i) Which of the following molecules would absorb the longest wavelength and why?



   ii) How many number of vibrational modes possible for carbon dioxide molecule?
   b) Discuss Bragg's law, types of crystals and applications of X-ray diffraction.

II. Write notes on: **(7 x 5 = 35)**

1. State and explain Beer-Lambert Law. Write briefly about the deviations of the absorption laws.
2. Write short notes on chemical shift and spin-spin coupling.
3. With a neat diagram explain the construction and working of Hollow cathode lamp and photomultiplier tube.
4. Explain the fundamental vibrations of the molecules in IR spectrophotometry.
5. Discuss McLafferty rearrangement and its significance in structural diagnosis.
6. Write a note on detectors used in HPLC.
7. Discuss the principle and applications of DTA.

******

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LO 981] MAY 2019 **Sub. Code: 2981**

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-I
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262981

Time : Three hours **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) Give the principle and working of Flame emission spectrophotometer.
   b) Explain the general Fragmentation Patterns for the Interpretation of organic compounds in Mass Spectrometry.
   c) Explain the theory of Electronic Spectroscopy and the different types of Electronic transitions encountered in UV Spectroscopy.

2. a) State Bragg's Law. Explain the X-Ray Powder Diffraction method.
   b) Explain the principle and working procedure of the GLC with its Limitations.
   c) Briefly explain the proton exchange reaction in NMR spectroscopy.

II. Write notes on: **(7 x 5 = 35)**

1. Write a note on the theory & applications of IR.
2. Explain briefly about Gel Electrophoresis.
3. Write a note on Chromophore and Auxochrome.
4. Discus the important factors affecting Differential Thermal Analysis (DTA).
5. Write a note on ^{13}C-NMR and coupling constant.
6. List out the applications of Atomic Absorption Spectroscopy.
7. Enumerate various Pharmaceutical applications of NMR Spectroscopy.

******

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LP 981] NOVEMBER 2019 **Sub. Code: 2981**

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-I
BRANCH VI – PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262981

Time : Three hours **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) Discuss the theory and applications of UV-Visible Spectroscopy.
   b) What are the different factors affecting Fluorescence?
   c) Explain the principle and instrument of an IR Spectrometer with a neat diagram.

2. a) Elaborate about High Performance Thin Layer Chromatography (HPTLC).
   b) Describe the working principle, instrumentation and applications of NMR Spectroscopy.

II. Write notes on: **(7 x 5 = 35)**

1. Discuss the principle and instrumentation of Capillary Electrophoresis.
2. Write a brief note on Thermogravimetric Analysis (TGA).
3. With neat labeled diagram, explain the instrumentation of Flame Emission Spectroscopy.
4. Discuss in detail about Column Chromatography.
5. Write short notes on Coupling Constant.
6. What are the various detectors used in Gas Chromatography?
7. Describe the working principle of Quadrupole and Time of Flight Mass Analysers.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LQ 0121] JANUARY 2021 Sub. Code: 2981

(APRIL 2020 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION

SEMESTER-I (PCI New regulations 2016)

PHARMACOLOGY – MPL

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262981

Time : Three hours **Answer ALL Questions** **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) Discuss the principle, instrumentation and applications of Spectrofluorimeter.
   b) Explain Beer-Lambert's Law and describe about the deviations.
   c) Write short notes on FT-IR.

2. a) Describe the working principle, instrumentation and applications of Differential Scanning Calorimetry (DSC).

   b) Explain in detail about the different types of ionization techniques in Mass Spectroscopy.

II. Write notes on: **(7 x 5 = 35)**

1. Write a note on Gel Chromatography.
2. Discuss the principle and working of Moving Boundary Electrophoresis.
3. What are the various factors influencing Chemical Shift?
4. Discuss in detail about X-Ray Diffraction Methods.
5. Describe the principle and instrumentation of Ion Exchange Chromatography.
6. Elaborate the Fragmentation Patterns and its Rule of organic compounds by Mass Spectrometry.
7. Explain the principle and instrument of Paper Electrophoresis with a neat labelled diagram.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MPHARM 0921] SEPTEMBER 2021 Sub. Code: 2981
(OCTOBER 2020 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
SEMESTER-I (PCI New regulations 2016)
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
Q.P. Code : 262981

Time : Three hours **Answer ALL Questions** **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) Discuss about the modes of molecular vibrations and factors affecting vibrational frequencies in IR Spectroscopy.
   b) Write a note on types of ion exchangers and the mechanism involved in ion exchange chromatography.

2. Explain the principle, instrumentation and applications of the HPLC.

II. Write notes on: **(7 x 5 = 35)**

1. Write a note on Bragg's law.
2. Write a note on chemical shift and spin-spin coupling.
3. Describe the principle and applications of isoelectric focusing and zone electrophoresis.
4. Write the instrumentation of atomic absorption spectroscopy.
5. Discuss about the factors affecting chemical shift.
6. Write about the solvent requirement in NMR Spectroscopy.
7. Calculate the concentration in mcg/ml of a solution of tryptophan (molecular weight 204.2) in 0.1M Hydrochloric acid, giving an absorbance at its wavelength maxima, 277nm, of 0.613 in a 4cm cell. The molecular absorptivity at 277 nm is 5432.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MPHARM 0122] JANUARY 2022 Sub. Code: 2981
(APRIL 2021 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
SEMESTER-I (PCI New regulations 2016)
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
Q.P. Code : 262981

Time : Three hours Answer ALL Questions Maximum : 75 Marks

I. Elaborate on: (2 x 20 = 40)

1. a) Draw a neat labeled diagram of Double beam UV Spectrophotometer and explain construction and working.
   b) Discuss the solvent requirement and relaxation process in NMR Spectroscopy.

2. Explain the principle, instrumentation and applications of the Gas chromatography.

II. Write notes on: (7 x 5 = 35)

1. Write the applications of Mass Spectroscopy.
2. Write the principle and different types of ion exchangers used in ion Exchange chromatography.
3. Write a note on Chromophore and Auxochrome.
4. Discuss on Iso electric focusing.
5. Write the theory of fluorescence with Jablonski diagram.
6. Explain about rotating crystal techniuque.
7. Explain the fundamental vibrations of the molecules in IR Spectrophotometry.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MPHARM 0422] APRIL 2022 Sub. Code: 2981
(OCTOBER 2021 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
SEMESTER-I (PCI New regulations 2016)
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
Q.P. Code : 262981

Time : Three hours **Answer ALL Questions** **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) Explain the construction and working of double beam UV Spectrophotometer.
   b) Explain the theory of electronic spectroscopy and types of electronic transitions in UV Spectroscopy.

2. a) Elaborate on principles, instrumentations used in Gas chromatography.
   b) Give the IR Interpretation for i) C_6H_5CHO ii) 2 – butanone.

II. Write notes on: **(7 x 5 = 35)**

1. Explain the different types of vibrations in IR Spectroscopy.
2. Describe the stationary phases used in HPLC and GLC.
3. Differentiate the dispersive IR and FT IR.
4. Write a note on Bragg's law.
5. Explain about (i) Capacity factor (ii) Asymmetry factor.
6. Explain the applications of potentiometry.
7. Explain about rotating crystal technique.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 0922] SEPTEMBER 2022 Sub. Code: 2981
(APRIL 2022 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
SEMESTER - I (PCI New regulations 2016)
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262981

Time : Three hours **Answer ALL Questions** **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a. Write a note on ^{13}C-NMR coupling constant.
   b. Discuss the solvent requirement and relaxation process in NMR Spectroscopy.
   c. Explain different analysers used in Mass Spectroscopy.

2. a. Draw a neat labeled diagram of Double beam UV Spectrophotometer and explain construction and working.
   b. Discuss the applications of Mass Spectroscopy.

II. Write notes on: **(7 x 5 = 35)**

1. Principle and applications of potentiometry.
2. Principle and working of zone electrophoresis.
3. Sample handling techniques in IR spectroscopy.
4. Discuss the various interferences in flame emission spectroscopy.
5. Detectors used in HPLC.
6. Principle involved in Differential Scanning Calorimetry.
7. Quenching.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[M.PHARM 0423] APRIL 2023 Sub. Code: 2981
(OCTOBER 2022 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
SEMESTER - I (PCI New regulations 2016)
PHARMACOLOGY – MPL
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code: 262981

Time : Three hours **Answer ALL Questions** **Maximum : 75 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a. Write the principle and instrumentation involved in HPLC.
   b. Discuss in detail about the developmental techniques and detection techniques in TLC.

2. a. Discuss about the modes of molecular vibrations and factors affecting vibrational frequencies in IR Spectroscopy.
   b. Discuss the applications of Mass Spectroscopy.

II. Write notes on: **(7 x 5 = 35)**

1. Advantages and disadvantages of Differential Thermal Analysis.
2. Chemical shift in NMR with examples.
3. Theory of fluorescence.
4. Principle involved in column chromatography.
5. Explain the instrumentation of Double beam UV Spectrophotometer.
6. Principle involved in electrophoresis.
7. Applications of potentiometry.

****