

Code No: H-8232/PCI

FACULTY OF PHARMACY

M. Pharmacy (PCI) (Pharmacy Practice) II-Semester (Backlog)

Examination, June- 2026

Subject: Principles of Quality use of medicines

Time: 3 Hours

Max Marks: 75

Note: Answer any five Questions.

(5 X 15 =75 Marks)

1. (a) Explain the building blocks that support Quality use of medicines.
(b) Describe the strategies used to promote QUM.
2. Write notes on
 - (a) Communication in QUM
 - (b) Cost-effective prescribing
3. Discuss the concept of Evidence-based medicine. Add a note on National essential drug list.
4. Briefly explain the Quality use of medicine in the following special population
 - (a) Pediatrics
 - (b) Geriatrics
 - (c) Pregnant women
5. (a) Discuss the regulation of OTC and complementary medicines in India.
(b) Discuss the role of industry in QUM in medicine development.
6. Explain the methods of causality assessment for a suspected adverse drug event. Add a note on role of pharmacist in pharmacovigilance.
7. Explain the methods of detection of medication errors. Suggest strategies to prevent medication errors.
8. (a) Define Adverse drug reaction and describe the predisposing factors of ADRs.
(b) Briefly explain how will you report a suspected adverse drug event through pharmacovigilance program of India.

FACULTY OF PHARMACY

M. Pharmacy (PCI) (Pharmacy Practice) II-Semester (Backlog) Examination June 2026

Subject: PHARMACOEPIDEMIOLOGY & PHARMACOECONOMICS

Time: 3 Hours

Max. Marks: 75

Note: Answer any five following questions.

(5x15=75 Marks)

1. a) Write the history of pharmacoepidemiology.
b) Write about the prevalence and incidence rate.
2. a) Explain spontaneous reporting and Odds' ratio calculation.
b) Write about prescription event monitoring.
3. a) Write in brief about the Indirect costs. Intangible costs.
b) Explain about the outcomes and Measurements of Pharmacoeconomics
4. a) Write the advantages and disadvantages of Cost Minimization Analysis.
b) Write the significance of cost Utility Analysis and cost of Illness.
5. a) Write a note on Markov Modelling.
b) Write a note on Decision Analysis and Sensitivity analysis.
6. a) Write a note on outcome measures and drug use measures.
b) Explain about the diagnosis and therapy surveys.
7. a) Describe about case reports and case series.
b) Write a note on time trade off and direct costs.
8. a) Describe Incremental Cost Effective Ratio and Average Cost Effective Ratio.
b) Explain the significance of Pharmacoeconomic models:

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FACULTY OF PHARMACY

M. Pharmacy (PCI) (Pharmacy Practice) II Semester (Backlog) Examination, June 2026

Subject: Clinical Pharmacokinetics and Therapeutic Drug Monitoring

Time: 3 hours

Max Marks: 75

Note: Answer any five questions.

(5x15=75Marks)

1. a) Explain different methods used to design a dosage regimen.
b) Describe Noncompartmental analysis with its advantages and disadvantages.
2. a) Explain determination of loading dose and maintenance dose.
b) Give an account of the determinants of bioavailability and importance of extraction ratio.
3. Explain different pharmacokinetic drug interactions in detail with suitable examples.
4. a) Discuss genetic variations in cytochrome P-450 isoenzymes with relevant examples.
b) Briefly explain the concept of Bayesian theory.
5. Explain the following
 - a) Protocol for TDM
 - b) Covariate relationships
 - c) Modelling random effects
6. a) Explain the dosage adjustment methods used in dosing paediatric population.
b) What are the pharmacokinetic alterations in pregnancy
7. a) Explain the Nonlinear mixed effect modelling method of population PK data analysis.
b) Explain the effect of hepatic diseases on pharmacokinetics.
8. Explain the therapeutic drug monitoring method for the following drugs
 - a) Phenytoin
 - b) Gentamicin
 - c) Digoxin

FACULTY OF PHARMACY

M. Pharmacy (PCI) (Pharmacy Practice) II-Semester (Backlog) Examination, June 2026

Subject: Pharmacotherapeutics – II

Time: 3 Hours

Max Marks: 75

Note: Answer any five Questions.

(5 x 15= 75Marks)

1. Explain the general principles of treatment of epilepsy. Add a note on management of status epilepticus.
2. Discuss the pathophysiology, risk factors and treatment of acute ischemic stroke.
3. Define and classify chronic kidney disease. Explain the pharmacological and nonpharmacological therapy of chronic renal failure.
4. Explain the clinical features, pathophysiology and treatment of Major depressive disorder.
5. Explain the following
 - (a) Rational use of antibiotics
 - (b) Management of malaria
6. Discuss the etiology, clinical features and management of Bacterial Endocarditis and urinary tract infections.
7. Explain the general principles of cancer chemotherapy. Discuss the chemotherapeutic regimen used in management of breast cancer.
8.
 - (a) Explain the management of acute myeloid leukemia.
 - (b) Discuss the anti-tuberculosis treatment regimen.

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) II-Semester (PCI) (Main & Backlog) Examination,
December 2025**

Subject: Principles of Quality use of medicines

Time: 3 Hours

Max Marks: 75

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

1. (a) Define and explain the principles of Quality use of medicines. [7+8]
(b) Explain the different levels in QUM pyramid.
2. (a) Explain the concept of Essential drugs. [6+9]
(b) Discuss the steps involved in Practice of evidence-based medicine in clinical Setting.
3. (a) Explain the need and importance of rational drug use in QUM. Discuss the role of pharmacist in rational drug use. [8+7]
(b) Describe the role of health care professionals in QUM.
4. (a) Explain the regulatory aspects of QUM in India. [7+8]
(b) Explain the quality use of medicine in organ failure and immunocompromised patients.
5. Define and Classify medication errors. Explain the role of pharmacist in monitoring and management of medication errors. [8+7]
6. Define and discuss the aims of pharmacovigilance. Explain different methods of monitoring ADRs. [5+10]
7. Discuss the following [5+5+5]
(a) Mechanisms of ADRs
(b) Management of ADRs
(c) Reporting of ADRs
8. (a) Enumerate the responsibilities of partners for QUM. [7+8]
(b) What is the role and responsibility of pharmacist in regulation of QUM?

FACULTY OF PHARMACY
M.Pharmacy (Pharmacy Practice)- II Semester(PCI) (Main & Backlog)
Examination, December 2025

Subject: Pharmacoepidemiology & Pharmacoeconomics

Time: 3 Hours

Max.Marks:75

Note: Answer any Five questions.

(5 X 15=75 Marks)

1. a) Write the significance of pharmacoepidemiology. (6)
b) Describe in detail about outcome measures. (9)
2. a) Write the importance of case report and case series in pharmacoepidemiology. (7)
b) Write a note on post marketing surveillance. (8)
3. a) Explain the significance of pharmacoeconomic studies in health care system. (7)
b) Write the history of pharmacoeconomics. (8)
4. a) Write the advantages and disadvantages of cost effective analysis. (7)
b) Write a note on cost benefit analysis and cost utility analysis. (8)
5. a) write the applications of pharmacoeconomics. (7)
b) Write a note on sensitivity analysis and markov modeling. (8)
6. a) Explain the software used in pharmacoeconomic analysis. (8)
b) Write the concept health related quality of life. (7)
7. a) Describe the concept of incidence and prevalence. (8)
b) Write a note on medications adherence measurements. (7)
8. a) Explain about the record linkage system. (7)
b) Write a note on direct cost and intangible cost. (8)

FACULTY OF PHARMACY

M. Pharmacy- II SEM (PCI) (Pharmacy Practice) (Main & Backlog) Examination, Dec 2025

Subject: Clinical Pharmacokinetics and Therapeutics Drug Monitoring

Time: 3 Hours

Max. Marks: 75

Note: Answer any five following questions.

(5 x 15 = 75 Marks)

1. (a) Explain different methods used in conversion from intravenous to oral dosing.
(b) Give a detailed account of nomograms and tabulations in designing a dosage regimen.
2. Discuss the following
 - a) Renal and non-renal clearance
 - b) Estimation of bioavailability
3. Give a detailed account of pharmacokinetic drug interactions with suitable examples. Briefly discuss the concept of Bayesian theory.
4. Discuss the genetic polymorphisms in cytochrome P-450 isoenzymes and drug targets.
5. Explain the following
 - a) Pharmacometrics software
 - b) Modeling random effects
 - c) Model validation
6. Discuss various methods used in extracorporeal removal of drugs. Add a note on dosing in paediatric patients.
7. a) Explain the pharmacokinetic alteration and dosing in elderly patients.
b) Discuss the TDM of sodium valproate and vancomycin.
8. Briefly discuss the following
 - a) Individualization of drug dosage regimen
 - b) PK/PD correlation in drug therapy

FACULTY OF PHARMACY
M. Pharmacy (Pharmacy Practice) (PCI) II-Semester (Main & Backlog)

Examination, December 2025

Subject: Pharmacotherapeutics – II

Time: 3 Hours

Max Marks: 75

Note: Answer any five Questions.

(5X15=75 Marks)

1. Discuss the pathophysiology, clinical features and management of Parkinson's disease.
2. Discuss the following
 - (a) Antiepileptic drugs for different seizure types
 - (b) Pain pathways
3.
 - (a) Discuss the management of generalized anxiety disorder.
 - (b) Briefly explain different sleep disorders.
4. Explain the following
 - (a) Surgical prophylaxis
 - (b) Therapy of dengue fever
5.
 - (a) Discuss the etiology and management of meningitis.
 - (b) Briefly explain hormonal replacement therapy.
6. Explain the management of head and neck cancer. Add a note on management of chemotherapy induced nausea and vomiting.
7.
 - (a) Explain the role of dialysis in the management of renal failure.
 - (b) Write a note on drug induced psychiatric disorders.
8.
 - (a) Discuss in detail the pharmacotherapy of urinary tract infections.
 - (b) Explain about drug induced renal disease.

FACULTY OF PHARMACY
M. Pharmacy II - Semester (PCI) (Pharmacy Practice) (Backlog) Examination,
June 2025
Subject: Principles of Quality use of Medicines

Time: 3 Hours

Max. Marks: 75

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

1. Explain the responsibilities of each partner involved in QUM. Add a note on the five principles underlying the quality use of medicines. (15)
2. a) Explain the steps involved in the process of evidence-based medicine. (10)
b) Write a short note on QUM evaluation strategy. (5)
3. Explain the consequences of irrational use of medicines. What is the role of pharmacist in rational drug use? (15)
4. Define essential drugs and briefly elucidate its concept. Write short notes on (5+5+5)
a) National essential drug policy
b) Essential drugs list
5. a) Describe the quality use of medicine in ambulatory and hospital settings. (8)
b) Explain the special prescribing consideration for geriatrics and pediatrics. (7)
6. (a) Explain the regulatory aspects of QUM for complementary and OTC medicines. (10)
(b) Write a brief note on cost-effective prescribing. (5)
7. a) Explain the WHO-UMC causality assessment scale. (7)
b) Discuss the mechanisms involved in different types of adverse drug reactions. (8)
8. Define and classify medication errors. Explain the causes, detection and prevention of medication errors. (15)

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FACULTY OF PHARMACY

M. Pharmacy (PCI) II - Semester (Pharmacy Practice) (Backlog) Examination, June 2025

Subject: Pharmacoepidemiology & Pharmacoeconomics

Time: 3 Hours

Max. Marks: 75

Note: Answer any five questions. All questions carry equal marks. (5 x 15 = 75 Marks)

1. (a) Write the history of pharmacoepidemiology. (6 Marks)
(b) Describe in detail about concept of risk. (9 Marks)
2. (a) Write the importance of post marketing surveillance in pharmacoepidemiology. (7 Marks)
(b) Write advantages of spontaneous reporting and prescription event monitoring. (8 Marks)
3. (a) Explain the significance of pharmacoeconomic studies in health care system. (7 Marks)
(b) Write a note on quality adjusted life years and disability adjusted life years. (8 Marks)
4. (a) Describe the advantages of cost minimization analysis. (5 Marks)
(b) Write the significances of cost benefit analysis and cost effective analysis. (10 Marks)
5. (a) Write the applications of pharmacoeconomics. (7 Marks)
(b) Write a note on sensitivity analysis and markov modeling. (8 Marks)
6. (a) Explain the software used in pharmacoeconomic analysis. (8 Marks)
(b) Write the concepts of health related quality of life. (7 Marks)
7. (a) Describe the concept of incidence and prevalence. (8 Marks)
(b) Write a note on medication adherence measurements. (7 Marks)
8. (a) Explain about the case reports and case series. (8 Marks)
(b) Write a note on history of pharmacoeconomics. (7 Marks)

FACULTY OF PHARMACY

**M. Pharmacy (PCI) II - Semester (Pharmacy Practice) (Backlog) Examination,
June 2025**

Subject: Clinical Pharmacokinetics & Therapeutic Drug Monitoring

Time: 3 Hours

Max. Marks: 75

Note: Answer any five questions. All questions carry equal marks. (5 x 15 = 75 Marks)

1. (a) Explain noncompartmental analysis of pharmacokinetic data. Discuss the merits and demerits of this approach. Define and explain extraction ratio. (10)
(b) Briefly discuss the role of Nomograms and tabulations in designing dosage regimen. (5)
2. (a) Explain different methods used to design a dosage regimen. (7)
(b) Explain the following (8)
 - (i) Determination of dose
 - (ii) Determination of frequency of drug administration
3. (a) Give a detailed description of induction and inhibition of drug metabolizing enzymes with suitable examples. (10)
(b) Write a short note on autoinduction. (5)
4. (a) Explain the Nonlinear mixed effect modelling method of population PK data analysis. (7)
(b) Briefly discuss different software's used in Pharmacometrics and dosing with feedback. (8)
5. (a) Give a detailed account of extracorporeal removal of drugs (8)
(b) Explain the genetic polymorphism in drug targets with examples. (7)
6. Briefly explain the following
(i) Drug dosing in elderly (8)
(ii) Pharmacokinetic alterations in pregnancy (7)
7. (a) Explain the influence of variability in age, weight and diseases on individualization of drug dosage regimen. (5)
(b) Discuss the TDM of any two cardiovascular drugs. (10)
8. (a) Discuss the genetic polymorphisms in Cytochrome P- 450 Isoenzymes with examples. (9)
(b) Explain the TDM of Sodium valproate. (6)

FACULTY OF PHARMACY

M. Pharmacy (PCI) II - Semester (Pharmacy Practice) (Backlog) Examination, June 2025

Subject: Pharmacotherapeutics – II

Time: 3 Hours

Max. Marks: 75

Note: Answer any five questions. All questions carry equal marks. (5 x 15 = 75 Marks)

1. (a) Discuss the clinical features and general approach to management of Parkinson's disease. (10)
(b) Explain the recommendations for managing seizures in women of child-bearing age and pregnant. (5)
2. Discuss the clinical presentation and pharmacological management of schizophrenia with a note on adverse effects of first-generation antipsychotics. (10+5)
3. (a) Discuss the goals, nonpharmacological and pharmacological management of Generalized anxiety disorder. (8)
(b) Discuss risk factors and treatment of acute ischemic stroke. (7)
4. (a) Discuss different categories, causes and management of acute renal failure. (9)
(b) Briefly explain rational use of antibiotics. (6)
5. Explain the therapeutic approach for management of HIV and related opportunistic infections. Add a note on dysmenorrhea. (10+5)
6. (a) Explain the therapeutic approach for the treatment of septicaemia. (9)
(b) Add a note on management of chemotherapy induced nausea and vomiting. (6)
7. Give a detailed account of the following
(a) Management of different types of Pneumonia. (10)
(b) Hormone replacement therapy (5)
8. Discuss the basic principles involved in the management of
(a) Breast cancer (8)
(b) Lung cancer (7)

FACULTY OF PHARMACY

**M. Pharmacy II - Semester (PCI) (Pharmacy Practice) (Main & Backlog) Examination,
December 2024**

Subject: Principles of Quality use of Medicines

Time: 3 Hours

Max. Marks: 75

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

1. Describe the following (8+7)
 - a) Strategies to promote QUM
 - b) QUM in a hospital setting
2. a) Define essential medicines list. What are the criteria for inclusion and deletion of a medicine in NLEM in India? (10)
b) Write notes on National essential drug policy (5)
3. a) What are the strategies to promote Rational use of medicines (7)
b) Describe QUM in pregnancy and lactation prescribing. (8)
4. a) Define and enumerate the goals of QUM service. write the importance of communication in QUM? (7)
b) Explain the five step EBM model. (8)
5. Explain the role of pharmacist in the following (5+5+5)
 - a) Promoting the quality use of medicine
 - b) Pharmacovigilance
 - c) Management of medication errors
6. Discuss the regulatory aspects of QUM for the OTC medications and complementary medicines in India. (15)
7. Define and classify medication errors. Explain the methods of detection of medication errors. (15)
8. a) Define Pharmacovigilance. Explain the process of spontaneous reporting of adverse drug reactions in India. (7)
b) Explain the Naranjo's algorithm for assessment of ADRs. (8)

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FACULTY OF PHARMACY

**M. Pharmacy (PCI) II - Semester (Pharmacy Practice) (Main & Backlog) Examination,
December 2024**

Subject: Clinical Pharmacokinetics & Therapeutic Drug Monitoring

Time: 3 Hours

Max. Marks: 75

Note: Answer any five questions. All questions carry equal marks. (5 x 15 = 75 Marks)

1. (a) Discuss compartment modelling approach and different categories of compartment models with their advantages and disadvantages. (8)
(b) Define and explain renal clearance. Explain the factors effecting renal clearance. (7)
2. (a) Discuss various Methods for conversion from intravenous infusion to oral dosing. (8)
(b) Discuss nomograms used in designing dosage regimen with one example. (7)
3. (a) Discuss different pharmacokinetic drug interactions with suitable examples. (10)
(b) Discuss genetic polymorphism in drug transporters. (5)
4. Discuss the following
(a) Concept of Bayesian theory (7)
(b) Pharmacogenetics and PK/PD considerations (8)
5. (a) What are the different methods of Analysis of Population Pharmacokinetic data. (7)
(b) Discuss the following (8)
(i) Modeling random effects
(ii) Simulation of dosage regimens
6. Discuss the pharmacokinetic alterations and different methods for drug dosing in pediatric patients. Add a note on peritoneal dialysis. (10+5)
7. (a) Explain general approaches for dose adjustment in renal impairment. (8)
(b) Explain the effect of hepatic disease on pharmacokinetics. (7)
8. Give a detailed account of the following
(a) Protocol for TDM (5)
(b) TDM of Phenytoin and Cyclosporine (10)

FACULTY OF PHARMACY

**M. Pharmacy (PCI) II - Semester (Pharmacy Practice) (Main & Backlog) Examination,
December 2024**

Subject: Pharmacotherapeutics - II

Time: 3 Hours

Max. Marks: 75

Note: Answer any five questions. All questions carry equal marks. (5 x 15 = 75 Marks)

1. (a) Explain the selection of antiepileptic drugs based on seizure type. Add a note on complications of antiepileptics. (10)
(b) Briefly describe pharmacological management of neuropathic pain. (5)
2. (a) Discuss the pathophysiology and explain the treatment of cognitive and behavioural symptoms of Alzheimer's disease. (9)
(b) Write a brief note on migraine triggers and medications for prophylaxis of migraine. (6)
3. Briefly explain the following
(a) Therapy of obstructive sleep apnea. (7)
(b) Drug induced psychiatric disorders (8)
4. (a) Discuss the classification, assessment, and complications of CKD in detail. (8)
(b) Explain the management of anemia of CKD. (7)
5. Explain the etiology and empirical therapy of the following infections
(a) Dengue fever (5)
(b) H1N1 (5)
(c) Malaria (5)
6. (a) Explain the etiology and management of Meningitis. (10)
(b) Briefly describe the therapy of any one upper respiratory tract infection. (5)
7. Briefly discuss the following
(a) General principles of cancer chemotherapy (7)
(b) Pharmacotherapy of head and neck cancer (8)
8. (a) Explain the pharmacotherapy of chronic myeloid leukemia. (7)
(b) Explain the principle, complications, advantages and disadvantages of hemodialysis. (8)

FACULTY OF PHARMACY

**M. Pharmacy (PCI) II - Semester (Pharmacy Practice) (Main & Backlog) Examination,
December 2024**

Subject: Pharmacoepidemiology & Pharmacoeconomics

Time: 3 Hours

Max. Marks: 75

Note: Answer any five questions. All questions carry equal marks. (5 x 15 = 75 Marks)

1. (a) Write the role of diagnosis and therapy surveys in pharmacoepidemiology. (6)
(b) Describe about the defined daily doses and prescribed daily doses. (9)
2. (a) Write the importance of post marketing surveillance in pharmacoepidemiology. (7)
(b) Write a note on retrospective and prospective cohort studies. (8)
3. (a) Explain the resources of cost estimation in pharmacoeconomics. (7)
(b) Write a note on incremental cost effective ratio and average cost effective ratio. (8)
4. (a) Describe the advantages of cost of illness. (5)
(b) Write a note on cost utility analysis and cost consequences analysis. (10)
5. (a) Write the applications of pharmacoeconomics. (7)
(b) Write a note on decision analysis and decision tree. (8)
6. (a) Explain the software used in pharmacoeconomic analysis. (8)
(b) Write the concept time trade off and discounting. (7)
7. (a) Describe the importance of record linkage systems in pharmacoepidemiology. (8)
(b) Write a note on odds ratio and prescription event monitoring. (7)
8. (a) Explain about the need and aims of pharmacoepidemiology. (8)
(b) Write a note on direct cost and intangible cost. (7)

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) II - Semester (PCI) (Backlog) Examination,
June 2024**

Subject: Pharmacotherapeutics – II

Time: 3 Hours

Max. Marks: 75

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

1. Discuss long-term management of epilepsy.
Explain the thrombolytic therapy used in the management of Stroke.
2. Explain the role of Carbidopa/L-Dopa in the management of Parkinson's disease.
Add a note on motor complications of L-Dopa.
What are the strategies to be used for prevention of acute ischemic stroke?
3. Discuss drug induced psychiatric disorders.
Explain the management of schizophrenias with the help of pharmacotherapeutic algorithm.
4. Discuss the process of hemodialysis and peritoneal dialysis.
Discuss the general guidelines for the rational use of antibiotics.
5. Explain the pathogenesis of Endocarditis. Add a note on the pharmacotherapy for native and prosthetic valve Endocarditis. Define Sepsis and enumerate the goals for its management.
6. Discuss Hormone Replacement Therapy.
Explain the management of opportunistic infections related to HIV.
7. Explain the pharmacotherapy of Urinary tract infection in detail.
Write a short note on chemoprophylaxis of malaria.
8. Explain in detail the therapies available for treatment for breast cancer.
Give an account of therapy for CML.

FACULTY OF PHARMACY

**M. Pharmacy (Pharm. Analysis) II-Semester (PCI) (Backlog) Examination,
June 2024**

Subject: Modern Bio Analytical Techniques

Time: 3 Hours

Max. Marks: 75

Note: Answer any five questions. All questions carry equal marks. (5 x 15 = 75 Marks)

1. (a) Write about the following sample preparation techniques. [6]
(i) Solid phase extraction
(ii) Liquid liquid extraction
(b) Explain the Bioanalytical method validation as per USFDA guidelines. [9]
2. (a) Discuss Biopharmaceutical factors affecting drug bioavailability. [10]
(b) Write the Biopharmaceutics classification system defined by FDA. [5]
3. (a) What is enzyme inhibition? Discuss drug interactions due to enzyme inhibition with examples. [7]
(b) Discuss drug-protein binding interaction with examples. [8]
4. (a) Write about principles, instruments, and applications of flow cytometry. [9]
(b) Write about cryopreservation and storage of cells. [6]
5. (a) Explain different study designs in bioequivalence studies. [10]
(b) Differentiate absolute and relative bioavailability with illustrative examples and equations. [5]
6. (a) Discuss the importance and applications of Toxicokinetic studies. [8]
(b) Write about the basic equipment used in the cell culture lab. [7]
7. (a) Discuss different approaches for the identification of metabolites. [10]
(b) Write a short note on the clinical significance of bioequivalence studies. [5]
8. (a) Describe the compendial methods of dissolution testing. [7]
(b) Write about in-vivo and in-vitro methods for checking the cellular permeability of new drug products. [8]

FACULTY OF PHARMACY
M. Pharmacy (Pharma. Analysis) II-Semester (PCI) (Backlog) Examination,
June 2024

Subject: Advanced Instrumental Analysis

Time: 3 Hours

Max. Marks: 75

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

1. (a) Explain about method development and trouble shooting in HPLC.
(b) Write about Chiral analysis of Pharmaceuticals using HPLC
2. (a) Discuss about Ion-exchange chromatography?
(b) Explain about head space sampling and columns used in Gas chromatography
3. (a) Write the principle and applications of Super critical fluid chromatography
(b) Explain about characteristics and methods of capillary electrophoresis?
4. Explain about fragmentation modes in mass spectrometry?
5. (a) Write about a) spin-spin coupling and b) relaxation process in NMR?
(b) Write in detail about COSY?
6. (a) Write about Nano Liquid Chromatography?
(b) Discuss in detail about detectors used in Gas chromatography?
7. (a) Explain about various parameters used in HPLC.
(b) Discuss about 2D NMR.
8. (a) Explain about Quadrupole and Time of flight in MS analysis.
(b) Write about ^{13}C -NMR?

FACULTY OF PHARMACY

M. Pharmacy (Pharm Analysis) II - Semester (PCI) (Backlog) Examination, June 2024

Subject: Herbal and Cosmetic Analysis

Time: 3 Hours

Max. Marks: 75

Note: Answer any five questions.

(75 Marks)

1. (a) How Herbal medicines are differentiated from Conventional Drugs?
(b) Discuss about Standardization of Herbal drugs as per WHO guidelines.
2. (a) What is Adulteration? Write about different types of Adulteration with suitable examples.
(b) Explain the procedure involved in determination of foreign matter pesticide residue in Herbal drugs.
3. (a) Discuss on Adulterant screening using advanced Analytical Techniques.
(b) Give the protocol for Stability Testing of natural products.
4. (a) Explain bio-drug drug interactions with suitable examples.
(b) Write notes on challenges in monitoring the safety of Herbal Medicines.
5. Write the procedure involved in determination of
(a) Acid value
(b) Moisture Content
6. Write short notes on
(a) Validation of Herbal Therapies.
(b) Global Marketing Management of Herbal Drugs
7. (a) Compare the monographs of Herbal Dugs mentioned in different Pharmacopoeia.
(b) Explain the determination of Saponification Value.
8. (a) Explain the general methods of analysis of raw materials used in cosmetics manufacturing as per BIS.
(b) Brief out the testing of baby care products.

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) - II Semester (PCI) (Main & Backlog) Examination,
October 2023**

Subject: Principles of Quality use of medicines

Time: 3 Hours

Max. Marks: 75

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

1. Define quality use of medicines. Explain the responsibilities of key partners involved in QUM. Add a note on the cost effective prescribing.
2. Discuss the evaluation strategy for QUM and mention the indicators for evaluation. Explain the concept of evidence based medicine and its practice in clinical settings.
3. Explain the consequences of irrational use of medicines. What is the role of pharmacist in rational drug use.
4. Explain the following
 - (a) Impact of QUM on E-health
 - (b) Strategies to promote QUM
5. Explain the special prescribing guidelines in pregnancy and immune-compromised patients. Discuss the role of pharmacist in QUM in special population.
6. Discuss the regulatory aspects of QUM for the OTC medications and complementary medicines in India. Add a note on role of industry in QUM while medicine development.
7. Explain different methods of causality assessment for adverse drug events. Discuss the mechanisms involved in different types of adverse drug reactions.
8. Briefly describe the detection and prevention of medication errors. Explain the role of pharmacist in monitoring and management of medication errors.

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) II-Semester (PCI) (Main & Backlog) Examination,
November 2023**

Subject: Pharmacoepidemiology & Pharmacoeconomics

Time: 3 Hours

Max. Marks: 75

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

1. (a) Write the scope and applications of pharmacoepidemiology. [6]
(b) Describe in detail about drug use measures. [9]
2. (a) Write the importance of case reports and case series. [7]
(b) Write a note on cross sectional study and case control study. [8]
3. (a) Explain the significance of pharmacoeconomic studies in health care system. [7]
(b) Write a note on cross sectional study and case control study. [8]
4. (a) Describe the advantages of cost minimization analysis. [5]
(b) Write the significance of cost benefit analysis and cost effective analysis. [10]
5. (a) Write the applications of pharmacoeconomics. [7]
(b) Write a note on sensitivity analysis and markov modeling. [8]
6. (a) Explain the software used in pharmacoeconomic analysis. [8]
(b) Write the concept health related quality of life. [7]
7. (a) Describe the concept of incidence and prevalence. [8]
(b) Write a note on medications adherence measurements. [7]
8. (a) Explain about the meta analysis. [8]
(b) Write a note on history of pharmacoeconomics. [7]

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Main & Backlog) Examination,
November 2023**

Subject: Clinical Pharmacokinetics and Therapeutic Drug Monitoring

Time: 3 Hours

Max. Marks: 75

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

1. Explain the importance of tabulations in designing dosage regimen. Add a note on compartment models.
Discuss various methods used for conversion of intravenous dosing to oral dosing.
2. Give an account of the relationship between pharmacogenetics and PK considerations. Discuss the drug interactions related to pharmacokinetics of a drug. What is the role of a pharmacist in managing such drug interactions.
3. Discuss the analysis of population pharmacokinetic data.
Explain the genetic polymorphism in drug targets.
4. Briefly explain the following
 - (a) Modeling covariate relationships
 - (b) Precision of the parameter estimates and confidence interval
5. Explain the following
 - (a) Drug dosing in geriatrics.
 - (b) General approach for dosage adjustment in renal failure
6. Explain the components of the protocol for therapeutic drug monitoring.
Describe the procedure of therapeutic drug monitoring for Sodium valproate and Gentamicin.
7. Discuss the advantages and disadvantages of hemodialysis and peritoneal dialysis. What are the pharmacokinetic changes that occur in patients with obesity?
8. Discuss the effects of genetic polymorphism in Cytochrome P-450 isoenzymes on drug response. Write a short note on adaptive method of dosing.

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Main & Backlog) Examination,
November 2023**

Subject: Pharmacotherapeutics - II

Time: 3 Hours

Max. Marks: 75

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

1. Explain pain pathways. Discuss the management of acute pain with the help of an algorithm. What are the commonly reported triggers and diagnostic criteria for migraine headache?
2. Describe the clinical presentation and general approach to management of early to advanced Parkinson's disease. What are the modifiable risk factors of Ischemic Stroke?
3. Explain the non-pharmacological therapy and pharmacotherapy for cognitive symptoms of Alzheimer's disease. Write a short note on treatment of Obstructive sleep apnea.
4. Discuss the renal disorders induced by drugs in detail. Explain the management of tuberculosis.
5. Give an outline of management of HIV infection. Briefly discuss the treatment of Meningitis.
6. Explain the pharmacotherapy of Dengue fever and Helminthiasis. What are the pathogens involved in etiopathogenesis of gastroenteritis.
7. Briefly explain the management of Lung cancer. Write a short note on chemotherapy induced nausea and vomiting.
8. What are the general principles of cancer chemotherapy? Explain the treatment strategies and management of Acute Leukemias with the help of an algorithm.

FACULTY OF PHARMACY

M. Pharmacy (Pharma Practice) II-Semester (PCI) (Backlog) Examination, April / May 2023
SUBJECT: Principles of Quality use of Medicines

Time: 3 Hours

Max Marks: 75

Note: Answer Any Five Questions. ALL Questions carry Equal Marks.

1. Define rational use of medicines. Discuss the core policies to promote rational drug use. Add a note on role of pharmacist in rational drug use. [15]
2. a) Define Adverse Drug Reaction. Discuss different types of ADRs and their mechanisms. [10]
b) Discuss the aims of Pharmacovigilance. [5]
3. a) Explain the factors that influence the medication errors. [7]
b) Discuss the Strategies to be employed to detect and prevent medication errors. [8]
4. Explain the following [8+7]
a) Regulation of OTC medicines
b) Role of industry in quality use of medicine
5. Discuss quality use of medicine in [8+7]
a) Pregnancy and lactation
b) Ambulatory care
6. a) Discuss the principles of quality use of medicine. [5]
b) Explain the QUM building blocks. Add a note on values and ideas on which each of the building blocks is based. [10]
7. a) What is the purpose of national list of essential medicines? [5]
b) Discuss the steps to practice evidence based medicine. [10]
8. a) Explain the various methods of causality assessment of ADRs. [8]
b) Discuss the role of pharmacist in monitoring and management of medication errors. [7]

Code No: E-12254/PCI

FACULTY OF PHARMACY

M. Pharmacy (Pharma Practice) II-Semester (PCI) (Backlog) Examination, May 2023
SUBJECT: Clinical Pharmacokinetics and Therapeutic Drug Monitoring

Time: 3 Hours

Max Marks: 75

Note: Answer Any Five Questions. ALL Questions carry Equal Marks.

1. a) Explain the pharmacokinetic parameters of a noncompartment model. Add a note on its advantages and disadvantages [6]
b) Discuss the concept of organ clearance. Define extraction ratio. [4]
c) What are the advantage and disadvantages of nomograms. Discuss the applications of nomograms in designing dosage regimens with examples. [5]
2. a) Briefly explain enzyme inducers and enzyme inhibitors. Write a short note on autoinduction with examples. [8]
b) Explain the genetic polymorphisms in CYP2D6 with examples [7]
3. a) What are the advantages and disadvantages of Nonlinear Mixed Effects Modeling. Add a note on Mixed effect model. [7]
b) Briefly describe the Estimation methods and Simulation of dosing regimen. [8]
4. a) Describe the components of a Hemodialysis circuit. Add a note on indications of renal replacement therapy. [8]
b) Discuss the effect of age on pharmacokinetics in elderly. [7]
5. a) Discuss the factors affecting drug dosage regimen. [5]
b) Explain the TDM procedure for Vancomycin and Lithium. [10]
6. a) Discuss PK/PD models used in drug dosing. [8]
b) Explain the basic methods used for drug dosing in renal failure. [7]
7. a) Briefly describe the analysis of population PK data. [9]
b) Discuss the method to estimate dosage regimens in paediatric population. [6]
8. a) Write a short note on drugs to be avoided during lactation. [5]
b) Briefly discuss the genetic polymorphism in drug transporters. [10]

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**M. Pharmacy (Pharma Practice) II-Semester (PCI) (Backlog) Examination,
April / May 2023**

SUBJECT: Pharmacotherapeutics-II

Time: 3 Hours

Max Marks: 75

Note: Answer Any Five Questions. ALL Questions carry Equal Marks.

1. a) Give a detailed account of general approach to the management of early to advanced Parkinson's disease. [8]
b) Explain the pharmacological treatment of epilepsy with the help of an algorithm. [7]
2. a) Discuss the clinical presentation and pharmacological management of migraine. [8]
b) Briefly discuss the pathophysiological theories of Alzheimer's disease. [7]
3. a) Explain the clinical presentation of anxiety disorders and outline the management of Generalized Anxiety Disorder. [9]
b) Classify sleep disorders. Outline the treatment of Obstructive Sleep Apnea. [6]
4. a) Briefly explain the clinical manifestations of CKD. Add a note on management of anemia and fluid retention in CKD. [9]
b) Write a note on drug induced psychiatric disorders. [6]
5. a) Discuss the etiologies of Bacterial Pneumonia. Explain the empirical antimicrobial therapy for Community Acquired Pneumonia. [10]
b) Briefly explain the treatment of Pharyngitis [5]
6. a) Explain the therapy of Infective Endocarditis in detail. [10]
b) Briefly explain the management of Pulmonary Tuberculosis. [5]
7. a) Write a short note on management of chemotherapy induced nausea and vomiting. [8]
b) Explain the general principles of cancer chemotherapy. [7]
8. a) Explain the treatment of uncomplicated major depression with the help of an algorithm. [7]
b) Discuss the principles of antibiotic therapy. [8]

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Code No: E-12255/PCI

FACULTY OF PHARMACY

**M. Pharmacy (Pharma Practice) II-Semester (PCI) (Backlog) Examination,
May 2023**

SUBJECT: Pharmacoepidemiology and Pharmacoeconomics

Time: 3 Hours

Max Marks: 75

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

(5 x 15 = 75 Marks)

1. a) Write a the history of pharmacoepidemiology. [6]
b) Describe in detail about concept of risk. [9]
2. a) Write the importance of Post marketing surveillance in pharmacoepidemiology. [7]
b) Write advantages spontaneous reporting and prescription event monitoring. [8]
3. a) Explain the significance of pharmacoeconomic studies in health care system. [7]
b) Write a note on quality adjusted life years and disability adjusted life years. [8]
4. a) Describe the advantages of cost minimization analysis. [5]
b) Write the significance cost benefit analysis and cost effective analysis. [10]
5. a) Write the applications of pharmacoeconomics. [7]
b) Write a note on sensitivity analysis and markov modeling. [8]
6. a) Explain the software used in pharmacoeconomic analysis. [8]
b) Write the concept health related quality of life. [7]
7. a) Describe the concept of incidence and prevalence. [8]
b) Write a note on medications adherence measurements. [7]
8. a) Explain about the case reports and case series. [8]
b) Write a note on history of pharmacoeconomics. [7]

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FACULTY OF PHARMACY

M. Pharmacy (Pharma Practice) II Semester (PCI) (Main & Backlog)

Examination, December 2022

SUBJECT: Principles of Quality use of Medicines

Time: 3 Hours

Max Marks: 75

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

1. Define medication errors. Explain the categories of medication errors according to National Coordinating Council for Medication Error Reporting and Prevention. [15]
2. a) What are the steps in the process ADR monitoring? Discuss various methods of identification of ADRs. [10]
b) Discuss the role pharmacist in the Pharmacovigilance. [5]
3. Discuss the regulation of complementary medicines and OTC products in India. [15]
4. a) Explain the importance of multidisciplinary care in QUM in hospital and ambulatory settings. [7]
b) Discuss quality use of medicine in immunocompromized and organ failure patients. [8]
5. a) Define essential medicines list. What are the criteria for inclusion and deletion of a medicine in NLEM in India? [10+5]
b) Define evidence based medicine. Discuss the dimensions of evidence based medicine.
6. Explain the role of pharmacist in the following [8+7]
a) Promoting rational drug use
b) Regulatory aspects
7. a) Discuss the strategies to promote QUM [7]
b) Explain the importance of communication in QUM [8]
8. a) Discuss the responsibilities of partners involved in QUM. [6]
b) Explain the QUM pyramid. Discuss the strategies to be taken at each level of pyramid. [9]

FACULTY OF PHARMACY

M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Main & Backlog)

Examination, December 2022

Subject: Clinical Pharmacokinetics and Therapeutic Drug Monitoring

Time: 3 Hours

Max Marks: 75

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

1. a) Discuss renal clearance with suitable equations. Explain the methods to determine renal clearance. [7]
b) Discuss the advantages of oral route over intravenous route. Explain the types of IV to PO therapy conversions. [8]
2. a) Define a drug target. Discuss the polymorphisms occurring in genes that encode for direct targets of a drug. [8]
b) Explain inhibition of drug metabolism with examples. [7]
3. a) Discuss various Pharmacometric softwares and random effect modelling. [9]
b) Explain model building techniques. [6]
4. a) Write a note on physiologic and pharmacokinetic changes in pregnancy. [9]
b) Define Teratogenesis. Give five examples of known teratogenic drugs and their effects. [6]
5. a) Explain the dosage consideration in hepatic disease [8]
b) Give a detailed account of Continuous Renal Replacement Therapy. [7]
6. a) Discuss how variability in age and genetics affect drug dosage regimen. [7]
b) Explain the TEM of any one cardiovascular drug and an immunosuppressant. [8]
7. a) What is relative and absolute bioavailability? Discuss the determinants of bioavailability. [7]
b) Describe the pharmacokinetic and pharmacodynamic sources of pharmacogenetic variations. [8]
8. a) Briefly explain the dosing considerations in obese patients. [7]
b) Discuss the appropriate indication for TDM. Add a note on TDM of phenytoin [8]

Code No: E-12147/PCI

FACULTY OF PHARMACY

M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Main & Backlog)

Examination, December 2022

SUBJECT: Pharmacoepidemiology and Pharmacoeconomics

Time: 3 Hours

Max Marks: 75

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

1. a) Write the role of diagnosis and therapy surveys in pharmacoepidemiology. [6]
b) Discuss about the defined daily doses and prescribed daily doses. [9]
2. a) Write the importance of post marketing surveillance in pharmacoepidemiology. [7]
b) Write a note on retrospective and prospective cohort studies. [8]
3. a) Explain the resources of cost estimation in pharmacoeconomics. [7]
b) Write a note on incremental cost effective ratio and average cost effective ratio. [8]
4. a) Describe the advantages of cost of illness. [5]
b) Write a note on cost utility analysis and cost consequences analysis. [10]
5. a) Write the applications of pharmacoeconomics. [7]
b) Write a note on decision analysis and decision tree. [8]
6. a) Explain the software used in pharmacoeconomic analysis. [8]
b) Write the concept time trade off and discounting. [7]
7. a) Describe the importance of record linkage systems in pharmacoepidemiology. [8]
b) Write a note on odds ratio and prescription event monitoring. [7]
8. a) Explain about the need and aims of pharmacoepidemiology. [8]
b) Write a note on direct cost and intangible cost. [7]

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FACULTY OF PHARMACY

M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Main & Backlog)

Examination, December 2022

Subject: Pharmacotherapeutics - II

Time: 3 Hours

Max Marks: 75

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

1. a) Write a detailed note on etiology of Parkinson's disease. Explain the motor complications of L-Dopa. [9+6]
b) Define an epileptic seizure and explain the classification of seizures based on clinical features.
2. a) Classify Pain and explain the pathophysiology of nociceptive pain. [9]
b) Explain different hypotheses explaining pathophysiology of depressive disorders. [6]
3. a) Classify Acute Kidney Injury and explain the types. Add a note on non-dialysis management of AKI. [10]
b) Give a detailed account of drug induced renal diseases. [5]
4. a) Discuss the clinical presentation of acute meningitis. Briefly explain the etiology and management of meningitis. [10]
b) Give an outline of the management of chronic bronchitis. [5]
5. a) Explain the clinical presentation and management of diarrhea. [8]
b) Discuss the etiology and pharmacotherapy of Urinary tract infections. [7]
6. a) Explain the Antimicrobial Prophylaxis used in Specific Surgical Procedure. [7+8]
b) What are the common opportunistic infections in a HIV patients? Explain their management.
7. a) Give an outline of treatment strategy in Acute leukemia with the help of an algorithm. [9]
b) Explain the Tumor lysis syndrome. [6]
8. a) Write a detailed note on hormone replacement therapy. [7]
b) Explain the treatment of stage I and II of non-small cell lung cancer. [8]

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Supply) Examination,
May 2022**

Subject: Clinical Pharmacokinetics & Therapeutic Drug Monitoring

Time: 3 Hours

Max. Marks: 75

Note: Answer any five of the following questions.

- 1 (a) Discuss the factors affecting dosage regimen.
(b) Explain the methods used to design a dosage regimen.
- 2 (a) Define extraction ratio. Give a detailed account on hepatic clearance of drugs.
(b) Explain the drug-drug interactions related to absorption with suitable examples.
- 3 Explain the following:
(a) Pharmacogenetics and PK/PD considerations
(b) Inhibition of biliary excretion.
- 4 Explain the following:
(a) Covariate screening methods
(b) Simulation of dosing regimens and dosing recommendations.
- 5 (a) What are the clinical implications of obesity? Explain the PK of drugs in obese patients.
(b) Explain the methods currently available to estimate the first drug dose for an infant.
- 6 Define Therapeutic drug monitoring. Explain in detail the procedure for TDM of Cyclosporine and Amiodarone.
- 7 (a) What are the assumptions of a basic PK/PD model?
(b) Explain the following models
(i) E_{max} Drug-Concentration Effect Model.
(ii) Effect Compartment of Link Model.
- 8 Discuss genetic polymorphism in drug transport with examples. Add a note Bayesian theory.

FACULTY OF PHARMACY

M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Supply) Examination, May 2022
Subject: Pharmacoepidemiology & Pharmacoeconomics

Time: 3 Hours

Max. Marks: 75

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

- 1 (a) Write the role of diagnosis and therapy surveys in pharmacoepidemiology.
(b) Describe about the defined daily doses and prescribed daily doses.
- 2 (a) Write the importance of post marketing surveillance in pharmacoepidemiology.
(b) Write a note on retrospective and prospective cohort studies.
- 3 (a) Explain the resources of cost estimation in pharmacoeconomics.
(b) Write a note on incremental cost effective ratio and average cost effective ratio.
- 4 (a) Describe the advantages of cost of illness.
(b) Write a note on cost utility analysis and cost consequences analysis.
- 5 (a) Write the applications of pharmacoeconomics.
(b) Write a note on decision analysis and decision tree.
- 6 (a) Explain the software used in pharmacoeconomic analysis.
(b) Write the concept time trade off and discounting.
- 7 (a) Describe the importance of record linkage systems in pharmacoepidemiology.
(b) Write a note on odds ratio and prescription event monitoring.
- 8 (a) Explain about the need and aims of pharmacoepidemiology.
(b) Write a note on direct cost and intangible cost.

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Supply) Examination,
May 2022**

Subject: Principles of Quality Use of Medicines

Time: 3 Hours

Max. Marks: 75

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

- 1 Explain the responsibilities of each partner involved in QUM. Add a note on the five principles underlying the quality use of medicines.
- 2 (a) What are the strategies to promote Rational use of medicines? Write a note on National essential drug policy.
(b) What is the purpose and development of National list of essential medicines?
- 3 (a) What are the different types of evidences available in clinical practice? Explain with the help of a pyramid.
(b) Describe QUM in pregnancy and lactation prescribing.
- 4 (a) Discuss the QUM evaluation strategy and explain the types of indicators used in evaluation of QUM.
(b) Define Pharmacovigilance. Explain the types of ADRs.
- 5 (a) What if the role of health care professionals in promoting QUM.
(b) Explain the application of QUM in Pediatric prescribing.
- 6 (a) What is the role of industry in QUM in medicine development?
(b) Discuss the responsibilities of pharmacist in regulatory aspects of QUM.
- 7 (a) Explain the WHO-UMC causality assessment scale.
(b) Explain the process of reporting ADRs in India.
- 8 Define and Classify medication errors. Explain the causes, detection and prevention of medication errors.

FACULTY OF PHARMACY

**M. Pharmacy (Pharmacy Practice) II Semester (PCI) (Supply) Examination,
May 2022**

Subject: Pharmacotherapeutics -II

Time: 3 Hours

Max. Marks: 75

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

- 1 Classify seizures depending on clinical presentation and explain the pharmacological management for each type.
- 2 (a) Briefly explain the Clinical presentation of Alzheimer's disease.
(b) Explain the treatment options for cognitive symptoms on Alzheimer's disease.
- 3 (a) What are the non-drug treatment options available for the treatment of depression?
(b) Explain the management of GAD in detail with the help of an algorithm.
- 4 (a) Explain the empirical antimicrobial therapy for pneumonia in adults.
(b) Discuss the management of otitis media and sinusitis.
- 5 (a) Discuss the management of Dengue.
(b) What is SIRS? Explain the antimicrobial therapy and hemodynamic support in sepsis.
- 6 Give an outline of the management of the following:
(a) Rheumatic fever
(b) Meningitis.
- 7 (a) Explain the prevention and antiviral therapy for management of HIV.
(b) Add a note on the palliative care in metastatic Breast cancer.
- 8 (a) Discuss the treatment strategy for Acute Leukemia.
(b) Write a short note on tumor lysis syndrome.
