

Pharmaceutical Chemistry Most Important Questions

D.Pharma 1st year

Syllabus & Questions

Pharmaceutical Chemistry-1st Most Important Questions

Chapter-1

Introduction to Pharmaceutical chemistry: Scope and objectives Sources and types of errors: Accuracy, precision, significant figures Impurities in Pharmaceuticals: Source and effect of impurities in Pharmacopoeial substances, importance of limit test, Principle and procedures of Limit tests for chlorides, sulphates, iron, heavy metals and arsenic.

Questions:

- Why is limit testing important in pharmaceutical analysis?
- Differentiate between qualitative and quantitative limit tests. Provide examples of each.
- Write definition of types of errors, Accuracy, Precision, Significant figures.
- What are the various sources of impurities?
- Write any 2 Limit test of Chloride, heavy metal. arsenic

Chapter-2

- **Volumetric analysis: Fundamentals of volumetric analysis, Acid-base titration, non-aqueous titration, precipitation titration, complex metric titration, redox titration**
- **Gravimetric analysis: Principle and method**

Questions:

- What are the fundamentals of volumetric analysis?
- What is volumetric analysis acid-base titration?

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- What is Neutralization Indicators?
- Explain Redox titration.
- Write details note on Gravimetric Analysis.

Chapter-3

Inorganic Pharmaceuticals: Pharmaceutical formulations, market preparations, storage conditions and uses of

- **Haematinics:** Ferrous sulphate, Ferrous fumarate, Ferric ammonium citrate, Ferrous ascorbate, Carbonyl iron
- **Antacids:** Aluminium hydroxide gel, Magnesium hydroxide, Magaldrate, Sodium bicarbonate, Calcium Carbonate
- **Anti-microbial agents:** Silver Nitrate, Ionic Silver, Chlorhexidine Gluconate, Hydrogen peroxide, Boric acid, Bleaching powder, Potassium permanganate
- **Dental products:** Calcium carbonate, Sodium fluoride, Denture cleaners, Denture adhesives, Mouth washes
- **Medicinal gases:** Carbon dioxide, nitrous oxide, oxygen

Questions:

- Discuss the uses of ferrous sulphate in pharmaceuticals and its mechanism of action as a haematinic.
- What is an advantage of ferric ammonium citrate compared to ferrous iron salts?
- Distinguish between adsorbents and protectives used in GI distress.
- Explain the medical uses of carbon dioxide and nitrous oxide.
- What is dental products with example?
- What is an example of an antimicrobial agent?
- Write the Pharmaceutical formulations, market preparations, storage conditions and uses of
 - a) Ferrous sulphate
 - b) Silver Nitrate
 - c) Boric acid
 - d) Sodium fluoride
 - e) Calcium Carbonate
 - f) Nitrous oxide

Chapter-4

Introduction to nomenclature of organic chemical systems with particular reference to heterocyclic compounds containing up to Three rings

Questions:

- What is the nomenclature system of heterocyclic compounds?

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- What heterocyclic compound has a three membered ring?

Chapter-5

Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names

Drugs Acting on Central Nervous System

- Anaesthetics: Thiopental Sodium*, Ketamine Hydrochloride*, Propofol
- Sedatives and Hypnotics: Diazepam*, Alprazolam*, Nitrazepam, Phenobarbital*
- Antipsychotics: Chlorpromazine Hydrochloride*, Haloperidol*, Risperidone*, Sulpiride*, Olanzapine, Quetiapine, Lurasidone
- Anticonvulsants: Phenytoin*, Carbamazepine*, Clonazepam, Valproic Acid*, Gabapentin*, Topiramate, Vigabatrin, Lamotrigine
- Anti-Depressants: Amitriptyline Hydrochloride*, Imipramine Hydrochloride*, Fluoxetine*, Venlafaxine, Duloxetine, Sertraline, Citalopram, Escitalopram, Fluvoxamine, Paroxetine

Questions:

- Explain the mechanism of action of Ketamine Hydrochloride as an anesthetic?
- What are the primary medical uses of Thiopental Sodium?
- Explain the mechanism of action of Nitrazepam in inducing sedation and hypnosis?
- What are the common side effects of Nitrazepam, Diazepam and Phenobarbital
- How do antipsychotics work?
- Write the brand name of Diazepam, Alprazolam, Phenytoin, Carbamazepine, Chlorpromazine Hydrochloride, Imipramine Hydrochloride.
- Classify any three
 - a. Anaesthetics
 - b. Sedatives and Hypnotics
 - c. Antipsychotics
 - d. Anticonvulsants
 - e. Anti-Depressants.

Chapter-6

Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names

Drugs Acting on Autonomic Nervous System

Sympathomimetic Agents (Adrenergic Agonists)

Direct Acting Agents :

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- Nor-epinephrine, *
- Phenylephrine,
- Terbutaline,
- Naphazoline, *
- Epinephrine,
- Dopamine, *
- Salbutamol,
- Tetrahydrozoline

Indirect Acting Agents :

- Hydroxyamphetamine,
- Pseudoephedrine

Sympathomimetic Agents (Adrenergic Agonists)

Mixed Acting Agents :

- Ephedrine,
- Metaraminol

Adrenergic Antagonists (Sympatholytic Agents)

Alpha Adrenergic Blockers :

- Tolazoline,
- Phentolamine,
- Phenoxybenzamine,

Adrenergic Antagonists (Sympatholytic Agents)

Beta Adrenergic Blockers :

- Propranolol, *
- Ateolol, *
- Carvedilol

Cholinergic Drugs And Related Agents (PARASYMPATHOMIMETRIC)

Direct Acting Agents

- Acetylcholine, *
- Carbachol,

Cholinesterase Inhibitors (Indirect Acting Agents)

- Neostigmine, *
- Edrophonium chloride,
- Tacrine hydrochloride,
- Echothiophate iodide.

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Cholinergic Blocking Agents (Cholinergic Antagonists)

- Atropine sulphate, *
- Ipratropium bromide.

Synthetic Cholinergic Blocking Agents

- Tropicamide,
- Cyclopentolate hydrochloride,
- Clidinium bromide, and
- Dicyclomine hydrochloride. *

Questions:

- Draw the chemical structure of Phenylephrine, Naphazoline, Dopamine, Propranolol, Acetylcholine, Neostigmine, Dicyclomine hydrochloride.
- Classify the Adrenergic Agonists, Cholinergic Drugs.
- Write the chemical name uses, stability and storage conditions, different types of formulations and brand names of Propranolol, Neostigmine, Atropine sulphate, Propranolol, Terbutaline.

Chapter-7

Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names

Drugs Acting on Cardiovascular System

- **Anti-Arrhythmic Drugs: Quinidine Sulphate, Procainamide Hydrochloride, Verapamil, Phenytoin Sodium*, Lidocaine Hydrochloride, Lorcainide Hydrochloride, Amiodarone and Sotalol**
- **Anti-Hypertensive Agents: Propranolol*, Captopril*, Ramipril, Methyldopate Hydrochloride, Clonidine Hydrochloride, Hydralazine Hydrochloride, Nifedipine,**
- **Antianginal Agents: Isosorbide Dinitrate**

Questions:

- What are the uses and storage conditions for Verapamil, an anti-arrhythmic agent?
- Explain the chemical structure of Phenytoin Sodium and its application in cardiovascular medicine?
- What are the different types of formulations available for Amiodarone, and what are some popular brand names associated with them?
- Explain the mechanism of action of Nifedipine as an anti-hypertensive agent and its formulations available in the market?
- Write the any 2 classification of Anti-Arrhythmic Drugs, Anti-Hypertensive Agents, Antianginal Agents.

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- Write the chemical name uses, stability and storage conditions, different types of formulations and brand names of Quinidine Sulphate, Captopril, Propranolol, Isosorbide Dinitrate.

Chapter-8

Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names

Diuretics

- Acetazolamide, Frusemide*, Bumetanide, Chlorthalidone, Benzthiazide, Metolazone, Xipamide, Spironolactone

Questions:

- What are the classification and chemical names of diuretics such as Acetazolamide, Frusemide, and Chlorthalidone?
- What are the primary uses of Metolazone as a diuretic?
- What are the side effects of Acetazolamide?
- What are the different types of diuretics?
- What are diuretics, and how do they work?
- Write the details notes on Frusemide and Bumetanide.

Chapter-9

Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names

Hypoglycemic Agents:

- Insulin and Its Preparations, Metformin*, Glibenclamide*, Glimepiride, Pioglitazone, Repaglinide, Gliflozins, Gliptins

Questions:

- Classify the Insulin and there uses.
- What are the potential side effects and contraindications associated with the use of Glibenclamide?
- Explain the mechanism of action of Pioglitazone and its potential benefits in the treatment of type 2 diabetes mellitus?
- Write the chemical name uses, stability and storage conditions, different types of formulations and brand names of Glibenclamide, Pioglitazone.
- What are the different types of insulin preparations available, and how do they differ in onset, peak, and duration of action?

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- What is Hypoglycemic Agents and its classified.

Chapter-10

Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names

Analgesic And Anti-Inflammatory Agents

- Analgesic And Anti-Inflammatory Agents: Morphine Analogues, Narcotic Antagonists; Nonsteroidal AntiInflammatory Agents (NSAIDs) – Aspirin*, Diclofenac, Ibuprofen*, oPiroxicam, Celecoxib, Mefenamic Acid, Paracetamol*, Aceclofenac

Question:

- What is Opioid Analgesics?
- What is Morphine Analogues?
- Write Short note on Nonsteroidal AntiInflammatory Agents (NSAIDs).
- Draw the chemical structure of Aspirin, Ibuprofen, Paracetamol.
- Write the chemical name uses, stability and storage conditions, different types of formulations and brand names of Aspirin, Ibuprofen, Paracetamol, Mefenamic Acid.

Chapter-11

Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names

Anti-Infective Agents

- Antifungal Agents: Amphotericin-B, Griseofulvin, Miconazole, Ketoconazole*, Itraconazole, Fluconazole*, Naftifine Hydrochloride
- Urinary Tract Anti-Infective Agents: Norfloxacin, Ciprofloxacin, Ofloxacin*, Moxifloxacin,
- Anti-Tubercular Agents: INH*, Ethambutol, Para Amino Salicylic Acid, Pyrazinamide, Rifampicin, Bedaquiline, Delamanid, Pretomanid*
- Antiviral Agents: Amantadine Hydrochloride, Idoxuridine, Acyclovir*, Foscarnet, Zidovudine, Ribavirin, Remdesivir, Favipiravir
- Antimalarials: Quinine Sulphate, Chloroquine Phosphate*, Primaquine Phosphate, Mefloquine*, Cycloguanil, Pyrimethamine, Artemisinin
- Sulfonamides: Sulfanilamide, Sulfadiazine, Sulfamethoxazole, Sulfacetamide*, Mafenide Acetate, Cotrimoxazole, Dapsone*

Questions:

- Write the chemical name, structure, uses, stability and storage conditions, different types of formulations and brand names of Fluconazole, Ofloxacin, INH,

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Ketoconazole, Rifampicin, Pretomanid, Acyclovir, Quinine Sulphate, Chloroquine Phosphate, Mefloquine, Sulfacetamide.

- Draw the chemical structure of Ketoconazole, Fluconazole, Ofloxacin, Sulfacetamide.
- Classify any 2 Anti-Tubercular Agents, Antimalarials, Antifungal Agents with Example.

Chapter-12

Antibiotics

- Antibiotics: Penicillin G, Amoxicillin*, Cloxacillin, Streptomycin, Tetracyclines: Doxycycline, Minocycline, Macrolides: Erythromycin, Azithromycin, Miscellaneous: Chloramphenicol* Clindamycin

Questions:

- Write the short note on Penicillin-G.
- Draw the chemical structure of Amoxicillin, Chloramphenicol.
- Write the chemical name, structure, uses, stability and storage conditions, different types of formulations and brand names of Amoxicillin, Cloxacillin, Streptomycin, Erythromycin, Azithromycin.
- Write the short note on Antineoplastic Agents.
- Write the uses and chemical name of Fluorouracil, Cisplatin.

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