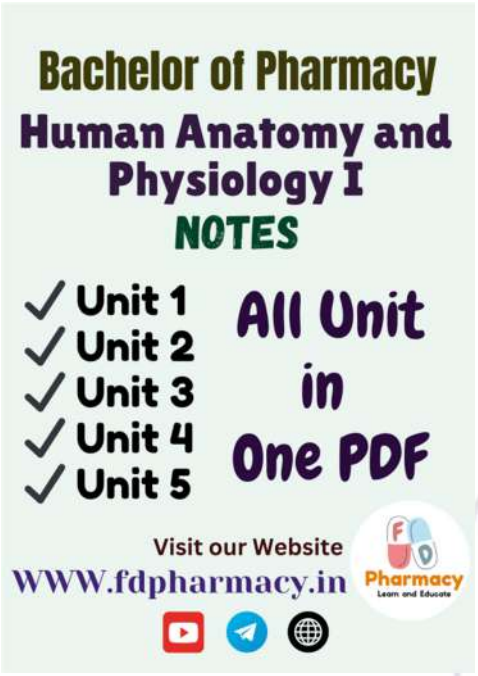
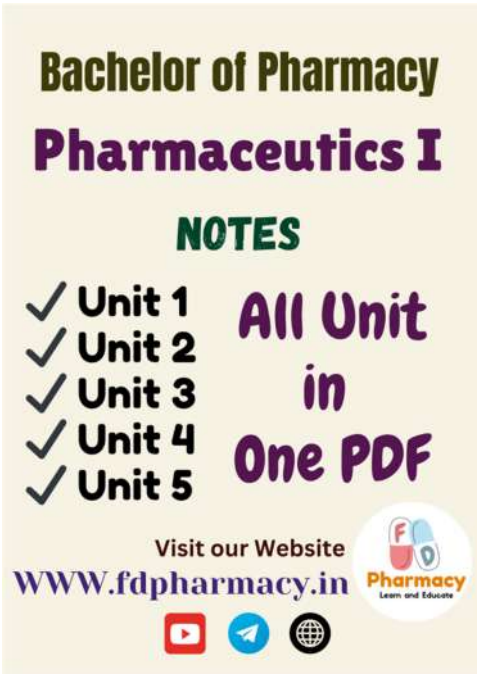
WELCOME

TO

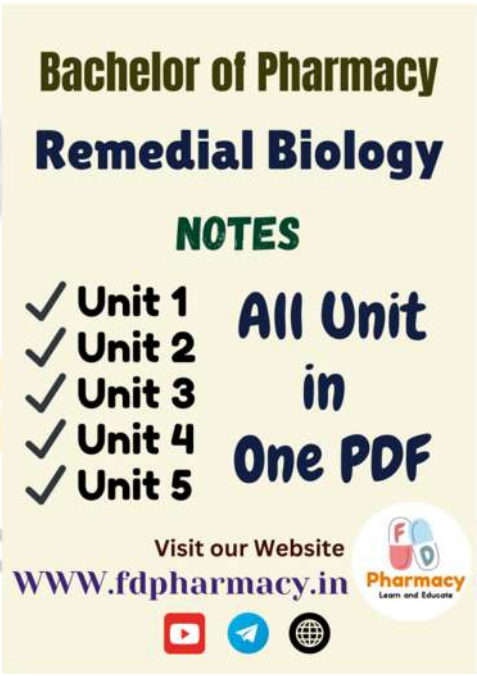

Bachelor of Pharmacy
Human Anatomy and Physiology I
NOTES
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
All Unit in One PDF
Visit our Website
WWW.fdpharmacy.in
Pharmacy
Learn and Educate


Bachelor of Pharmacy
Pharmaceutical Analysis I
NOTES
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
All Unit in One PDF
Visit our Website
WWW.fdpharmacy.in
Pharmacy
Learn and Educate


Bachelor of Pharmacy
Pharmaceutics I
NOTES
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
All Unit in One PDF
Visit our Website
WWW.fdpharmacy.in
Pharmacy
Learn and Educate


Bachelor of Pharmacy
Pharmaceutical Inorganic Chemistry
NOTES
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
All Unit in One PDF
Visit our Website
WWW.fdpharmacy.in
Pharmacy
Learn and Educate


Bachelor of Pharmacy
Communication skills
NOTES
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
All Unit in One PDF
Visit our Website
WWW.fdpharmacy.in
Pharmacy
Learn and Educate


Bachelor of Pharmacy
Remedial Biology
NOTES
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
All Unit in One PDF
Visit our Website
WWW.fdpharmacy.in
Pharmacy
Learn and Educate

PHARMACEUTICAL INORGANIC CHEMISTRY

UNIT 4

TOPIC :

- **Astringents :** Zinc Sulphate, Potash Alum

ASTRINGENTS

→ Astringents are chemical substances that cause the contraction or shrinkage of body tissues, especially the mucous membranes and skin, by precipitating proteins on the surface.
→ They reduce secretions, inflammation, and bleeding, and are often used for local application.

Mechanism of Action

→ Astringents precipitate proteins present on the surface of tissues.
→ This results in the formation of a protective layer that:
- Reduces inflammation
- Protects underlying tissue
- Contracts blood vessels (vasoconstriction)
- Decreases capillary permeability
- Reduces local secretions and bleeding

Classification of Astringents

1. Metallic Astringents

- Contain metal ions like aluminium or zinc that bind with proteins.
- Eg : Zinc Oxide, Potash Alum, etc

2. Vegetable Astringents

- Contain tannins or phenolic compounds that precipitate proteins.
- Eg : Tannic Acid, Catechu, etc

3. Miscellaneous Astringents

- Used in various pharmaceutical and cosmetic products.
- Eg : Alcohol (70%), Saline Water, etc

Uses of Astringents

1. To Stop Minor Bleeding
    - After shaving, small cuts, or dental procedures
    - Example: Alum sticks
2. As Anti-inflammatory Agents
    - In treatment of skin inflammations, eczema, or dermatitis
3. In Mouth and Throat Preparations
    - For gargles, lozenges, and mouthwashes
    - Relieves sore throat and swollen gums
4. In Eye Drops and Lotions
    - Reduces conjunctival swelling
    - Example: Zinc sulphate eye drops
5. In Cosmetics and Skin Care
    - Tightens pores, removes excess oil
    - Found in toners, face masks, and aftershave lotions
6. In Diarrhea Treatment
    - Some vegetable astringents (like tannic acid) reduce intestinal secretions

ZINC SULPHATE

- Chemical Formula : $ZnSO_4 \cdot 7H_2O$ (Heptahydrate form)
- Molecular Weight : 287.5 g/mol
- Synonyms : White Vitriol, Zincum Sulfuricum

Method of Preparation

- Zinc sulphate can be prepared by the reaction of zinc metal or zinc oxide with dilute sulphuric acid (H_2SO_4):

$$Zn+H2SO4 \rightarrow ZnSO4+H2\uparrow$$

Physical Properties

- Appears as white crystalline powder or transparent colorless crystals
- Odourless
- Has astringent and metallic taste
- Soluble in water
- Insoluble in alcohol
- Efflorescent on exposure to air (loses water of crystallization)

Chemical Properties

Decomposition :

On strong heating, zinc sulphate decomposes to zinc oxide, sulphur dioxide (SO_2) and oxygen.

$$ZnSO4 \rightarrow ZnO+SO2+½O2$$

Uses

1. As an Emetic (in older practice):
   - Induces vomiting in emergency poisoning cases *(Note: now rarely used due to better alternatives)*
2. As an Astringent and Mild Antiseptic:
   - Used in eye drops, lotions, and ointments
3. In Nutritional Supplements:
   - Provides zinc in deficiency disorders
   - Used in diarrhea management in children
4. In Manufacturing and Industry:
   - Used in electroplating, dyeing, and as a preservative for leather and wood

POTASH ALUM

- Chemical Name : Potassium Aluminium Sulphate
- Chemical Formula : $KAl(SO_4)_2 \cdot 12H_2O$
- Molecular Weight : 474.39 g/mol
- Synonyms : Alum, Fitkari (commonly in India), Potassium alum

Method of Preparation

- Potash alum is prepared by mixing aluminium sulphate and potassium sulphate in equimolar quantities in hot water and allowing the solution to crystallize:

$$K2SO4+Al2(SO4)3+24H2O \rightarrow 2KAl(SO4)2 \cdot 12H2O$$

Physical Properties

- Appears as large, colorless, transparent crystals
- Odourless
- Has astringent and sweetish taste
- Soluble in water, insoluble in alcohol
- On heating, it loses water of crystallization and swells up
- Turns powdery white on exposure to air (efflorescence)

Chemical Properties

Astringent Action:

- Causes contraction of body tissues, reduces bleeding and secretions.

Uses:

1. As an Astringent:
   - Used in minor cuts and shaving to stop bleeding
   - Used in gargles and mouthwashes for sore throat
2. As an Antiseptic:
   - Used in dusting powders and lotions to prevent infections
3. Water Purification:
   - Acts as a coagulant, removes suspended particles by flocculation
4. In Dyeing and Tanning:
   - Used as a mordant in fabric dyeing
   - Used in leather tanning