YOU TUBE VIDEO LECTURES

S. NO	SUBJECT CODE	SUBJECT TITLE	TOPIC	ICT TOOLS USED	LINK
1.	BP204T	Pathophysiology – Theory	GERD	Youtube – Video Lecture	https://youtu.be/bzW_Z__jvsQ
2.	BP102T	Pharmaceutical Analysis I – Theory	Spectroscopy	Youtube – Video Lecture	https://youtu.be/5j07YdMJE9k
3.	BP103T	Pharmaceutics I – Theory	Tablet	Youtube – Video Lecture	https://youtu.be/0TMIve7GGc0
4.	BP503T	Pharmacology II – Theory	Anatomy and Physiology	Youtube – Video Lecture	https://youtu.be/K8ulEpNbdjk

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COMPUTER AND IT FACILITIES

Year	Quantity	Processor	Ram	Storage	Cabinet	Wi-Fi Bandwidth	CCTV Cameras Installed	Key Highlights
2018	15	Intel i3-7th Gen (7100)	2GB	500GB HDD	ATX	100 Mbps	-	Initial IT upgradation
2019	15	Intel Core 2 Duo @ 2.80 GHz	2GB DDR 3	320GB HDD	ATX	100 Mbps	-	System expansion
2020	10	Intel Core i3-1st Gen	2GB	500GB HDD	ATX	100 Mbps	10	Storage upgrade + CCTV installation
2021	10	Intel Core i3-7th Gen	4GB	500GB HDD	ATX	100 Mbps	5	RAM upgrade + Additional CCTV cameras
2022	12	Intel Core i6-6th Gen	Not specified	128GB SSD	ATX	100 Mbps	-	Shift to SSDs
2023	10	Intel Core i5-4th Gen	8GB	500GB HDD	ATX	100 Mbps	10	Major RAM boost + CCTV installation
2024	-	Continuous upgrades	-	-	-	100 Mbps	-	IT infrastructure strengthening

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LIST OF TEACHING METHODS

S.NO	TEACHING METHOD	DESCRIPTION
1	**Lectures**	Traditional method to deliver theoretical concepts in subjects like pharmacology and pharmaceutics. 
2	**PowerPoint-Based Presentations**	Widely used for delivering organized, visual, and engaging content in classrooms, business meetings, and conferences, helping presenters communicate ideas clearly and effectively using slides and multimedia. 

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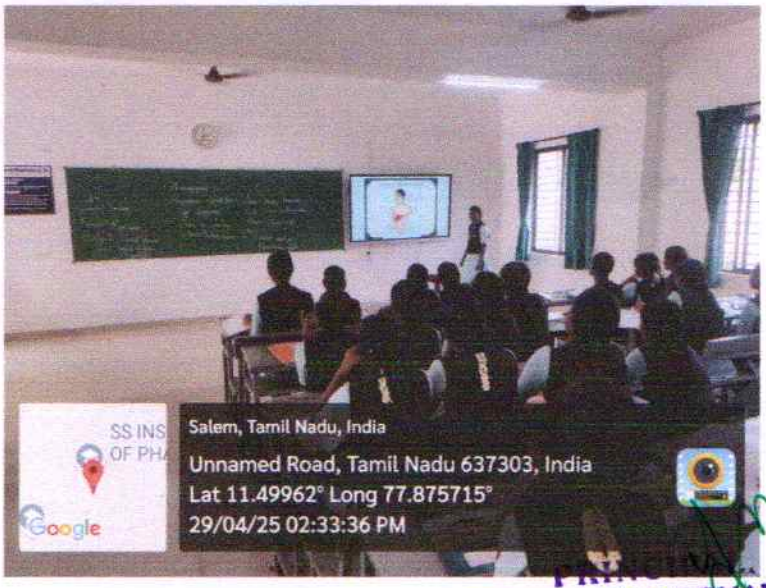
3	**Laboratory Practical's**	Hands-on sessions for compounding, formulation, drug analysis, and experimental pharmacology. 
4	**Case-Based Learning**	Students analyze and discuss real or simulated patient cases to apply clinical knowledge. 
5	**Team-Based**	Structured group work that involves preparation, reading, assurance, and

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	Learning (TBL)	application exercises. 
6	**Flipped Classroom**	Students study material at home (videos/readings) and engage in active learning during class. 
7	**Seminars and Presentations**	Oral presentations by students or experts on current topics or research in pharmacy. 

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POWER POINT PRESENTATION

S.No	Semester	Subject Code	Subject Title	ICT Tools Used	Title
1	VI	BP604T	Biopharmaceutics and Pharmacokinetics – Theory	Power Point Presentation	Absorption
2	VI	BP601T	Medicinal Chemistry III – Theory	Power Point Presentation	Anti-Fungal Drugs
3	V	BP501T	Medicinal Chemistry II – Theory	Power Point Presentation	Antihistamines Agents
4	V	BP507P	Pharmacology II – Practical	Power Point Presentation	Anti-Hypertensive Drugs
5	IV	BP402T	Medicinal Chemistry I – Theory	Power Point Presentation	Bioisosterism
6	V	BP502T	Industrial PharmacyI– Theory	Power Point Presentation	Cosmetics
7	III	BP301T	Pharmaceutical Organic Chemistry II – Theory	Power Point Presentation	Cyclo Alkanes
8	I	BP104T	Pharmaceutical Inorganic Chemistry – Theory	Power Point Presentation	Dental Products
9	II	BP203T	Biochemistry – Theory	Power Point Presentation	Enzymes
10	III	BP304T	Pharmaceutical Engineering – Theory	Power Point Presentation	Evaporation
11	VI	BP605T	Pharmaceutical Biotechnology – Theory	Power Point Presentation	Gel Electrophoresis
12	V	BP504T	Pharmacognosy and Phytochemistry II– Theory	Power Point Presentation	Metabolic Pathway
13	II	BP202T	Pharmaceutical Organic Chemistry I – Theory	Power Point Presentation	Nomenclature
14	VIII	BP809ET	Cosmetic Science	Power Point Presentation	Oily And Dry Skin
15	I	BP102T	Pharmaceutical Analysis I – Theory	Power Point Presentation	Pharmaceutical Analysis
16	VI	BP606T	Quality Assurance –Theory	Power Point Presentation	Premises
17	III	BP302T	Physical Pharmaceutics I – Theory	Power Point Presentation	Protein Binding
18	IV	BP401T	Pharmaceutical Organic Chemistry III– Theory	Power Point Presentation	Stereoisomerism
19	IV	BP407P	Physical Pharmaceutics II – Practical	Power Point Presentation	Surfactants

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COSMETIC SCIENCE

VIII Semester Unit V

Syallabus (unit V)

Oily and dry skin, causes leading to dry skin, skin moisturisation . Basic understanding of the terms Comedogenic , dermatitis.

Cosmetic problems associated with Hair and scalp: Dandruff, Hair fall causes

Cosmetic problems associated with skin: blemishes, wrinkles, acne, prickly heat and body odor.

Antiperspirants and Deodorants- Actives and mechanism of action

Oily Skin

Definition: Skin producing excess sebum, leading to a shiny appearance.

Characteristics:

- Enlarged pores
- Prone to acne and blackheads

Causes:

- Genetics
- Hormonal changes (e.g., puberty, pregnancy)
- Overuse of harsh skincare products

Dry Skin

Definition: Skin lacking sufficient moisture, appearing rough or flaky.

Characteristics:

- Tightness, especially after washing
- Itchiness, scaling, or cracking

Impact:

- Increased sensitivity
- Risk of eczema or dermatitis

Causes of Dry Skin

Environmental Factors:
- Cold weather, low humidity
- Excessive sun exposure

Lifestyle Factors:
- Hot showers, harsh soaps
- Dehydration, poor diet

Medical Conditions:
- Eczema, psoriasis, hypothyroidism

Term - Comedogenic

Definition: Refers to ingredients or products that clog pores, leading to comedones (blackheads/whiteheads).

Examples:
- Comedogenic: Coconut oil, isopropyl myristate
- Non-Comedogenic: Squalane, mineral oil

Importance: Choose non-comedogenic products for oily/acne-prone skin.

Skin Moisturization

Purpose: Restores hydration, strengthens skin barrier.

Key Ingredients:
- Humectants: Glycerin, hyaluronic acid
- Occlusives: Petrolatum, lanolin
- Emollients: Ceramides, fatty acids

Application Tips:
- Apply after bathing
- Use products suited to skin type

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Term - Dermatitis

Definition: Inflammation of the skin causing redness, itching, or swelling.

Types:
- Atopic Dermatitis: Chronic, linked to allergies
- Contact Dermatitis: Triggered by irritants/allergens

Management:
- Avoid triggers
- Use corticosteroids or moisturizers

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Hair and Scalp Issues - Overview

Common cosmetic concerns:
- Dandruff
- Hair fall

Impact:
- Aesthetic concerns
- Potential underlying health issues

Hair Fall Causes

Common Causes:
- Hormonal: Androgenetic alopecia, postpartum
- Nutritional: Deficiencies in iron, biotin, or protein
- Stress: Telogen effluvium
- Medical: Thyroid issues, alopecia areata

Management:
- Address underlying cause
- Minoxidil, supplements

Dandruff

Definition: Flaky, itchy scalp caused by excess skin cell turnover.

Causes:
- Seborrheic dermatitis
- Dry scalp, fungal overgrowth (Malassezia)

Management:
- Anti-dandruff shampoos (zinc pyrithione, ketoconazole)
- Regular scalp hygiene

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Skin Cosmetic Problems - Overview

Common issues:
- Blemishes
- Wrinkles
- Acne
- Prickly Heat
- Body Odor

Impact: Aesthetic, psychological, and social

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Blemishes

Definition: Marks or discolorations on skin (e.g., scars, dark spots).

Causes:

- Acne scars
- Hyperpigmentation
- Sun damage

Management:

- Exfoliation (AHAs, BHAs)
- Brightening agents (vitamin C, niacinamide)

Acne

Definition: Inflammatory condition with pimples, blackheads, or cysts.

Causes:

- Excess sebum
- Clogged pores, bacteria (Propionibacterium acnes)
- Hormonal fluctuations

Management:

- Benzoyl peroxide, salicylic acid
- Prescription retinoids

Wrinkles

Definition: Creases or lines on skin due to aging or environmental factors.

Causes:

- Loss of collagen/elastin
- UV exposure, smoking
- Repetitive facial expressions

Management:

- Retinoids, peptides
- Sunscreen, hydration

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Prickly Heat

Definition: Rash caused by blocked sweat ducts, leading to itching or stinging.

Causes:

- Hot, humid weather
- Tight clothing

Management:

- Loose clothing
- Calamine lotion, cooling showers

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Body Odor

Definition: Unpleasant smell due to bacterial breakdown of sweat.

Causes:

- Apocrine gland sweat (armpits, groin)
- Poor hygiene, diet

Management:

- Regular bathing
- Deodorants/antiperspirants

Antiperspirants - Actives

Active Ingredients:

- Aluminum compounds (e.g., aluminum chlorohydrate)

Purpose:

- Block sweat ducts temporarily
- Reduce moisture, inhibit bacterial growth

Forms: Roll-on, stick, spray

Antiperspirants and Deodorants - Overview

Antiperspirants: Reduce sweat production.

Deodorants: Neutralize or mask odor.

Common Use: Armpits, sometimes feet.

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Antiperspirants - Mechanism of Action

How It Works:

- Aluminum salts form a plug in sweat ducts.
- Reduces sweat release on skin surface.

Effectiveness:

- Lasts 12-24 hours
- Varies by individual and product strength

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Deodorants - Actives

Active Ingredients:
- Antibacterial agents (triclosan, alcohol)
- Fragrances
- Odor absorbers (baking soda, charcoal)

Purpose:
- Kill odor-causing bacteria
- Mask or neutralize smell

Choosing Products

For Oily Skin/Acne:
- Non-comedogenic, oil-free products

For Dry Skin:
- Hydrating, fragrance-free products

For Hair/Scalp:
- Targeted shampoos, avoid harsh sulfates

For Odor/Sweat:
- Combine antiperspirant and deodorant for best results

Deodorants - Mechanism of Action

How It Works:
- Antibacterial agents reduce bacterial population.
- Fragrances cover odor.
- Absorbers bind odor molecules.

Effectiveness:
- Temporary, requires reapplication
- Does not reduce sweat

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Prevention Tips

Skincare:
- Daily cleansing, moisturizing, sunscreen
- Avoid over-exfoliation

Haircare:
- Regular washing, avoid heat damage
- Balanced diet

Odor/Sweat:
- Good hygiene, breathable fabrics

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INDUSTRIAL PHARMACY

UNIT-5

- COSMETICS
- PHARMACEUTICAL AEROSOLS
- PACKING MATERIALS SCIENCE

UNIT V

Cosmetics: Formulation and preparation of the following cosmetic preparations: lipsticks, shampoos, cold cream and vanishing cream, tooth pastes, hair dyes and sunscreens.

Pharmaceutical Aerosols: Definition, propellants, containers, valves, types of aerosol systems; formulation and manufacture of aerosols; Evaluation of aerosols; Quality control and stability studies.

Packaging Materials Science: Materials used for packaging of pharmaceutical products, factors influencing choice of containers, legal and official requirements for containers,

COSMETIC PREPARATIONS

- **Cosmetics** are defined as the Preparations intended to be rubbed or sprinkled or applied to any part of the external surfaces of the human body (Face, lips, nails) for cleansing, beautifying, promoting attractiveness or perfuming or protecting or altering the appearance or masking the body odour.
- Generally Cosmetic preparations are not used to prevent or treat any disease
- **Cosmetology** is defined as the science that deals with the laws governing the production, storage and application of cosmetic products

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Classification of Cosmetic preparations/ Different types of Cosmetics

On the basis of Physical form, It is classified into

- Oils - Eg: Hair oils
- Emulsions - Eg: Cold Cream, Vanishing cream, Cleansing cream
- Suspensions - Eg: Calamine Lotion
- Pastes - Eg: Tooth paste
- Sticks - Eg: Lipstick
- Jellies - Eg: Brilliantine jelly
- Cakes - Rouge compacts, makeup compacts
- Powders - Face powder, Tooth powder
- Solutions - After shave lotions, Astringent lotions

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- **On the basis of ap ication in the organ** t is classified into
- Cosmetics for Skin Eg: Powders, Cream Lotions, Suntan pre rations
- Cosmetics for hairs Eg: Shampoos, hair onics, Shaving cream Depilatories
- Cosmetics for nails Eg: Nail polishes an polish removers, Ma icure preparations
- Cosmetics for teetl and mouth - Eg: Der ifices and Mouth w hes
- For baby preparati Eg: Baby powders, aby oils, Baby sham os
- Other cosmetics Eg Eye preparations, Fc t powders etc

LIPST KS

- It is the cosmetic p paration prepared b disperion of colour g matter in a base consisting of ixture of oils, fats ar waxes which are m lded into sticks.

Uses:

- To give attractive c our and appearance o the lips
- To prevent crackin and chapping of lips
- For emollient actio (Soft and prevent d ing)

deal Characteristics

- Free from grittines
- Should have unifor color
- Stable through out ne shelf life
- Should be safe der otologically
- Should be easily ar ly

ormulation of Lipstic or Ingredients used ir psticks

Colouring agents:

Colour is imparted tc ne lips in two ways

a) By staining th skin in which dye to b enetrate into the outi surface of lips

b) By covering l with dye which hide ughness of lips

Soluble dyes like met lene blue, Brilliant gre n, Erythrosine red

Insoluble dyes like irc oxide colours, calcium Barium, Strontium lake of red

Bases:

These are used to giv proper consistency to e preparations.

Oils, fats and waxes used as bases in lipst s.

It produces greasy emollient action whic keep the lips soft and ist in appearance.

Dye stuff Solvents

- For dissolving the louring agents
- To give plasticity tc he lipsticks
- Eg: Tetra hydro fur ryl esters, Polyethyl e glycols

Wetting agents:

- Used to soubilize t dyestuff and impro e the staining powe
- Eg: Loramine wax, olyethylene glycols

Preservatives:

- Prevents the micro al growth
- Eg: Methyl paraben Propyl paraben

Fragrance:

- Mask the fatty odc of the base
- Eg: Rose oil, Jasmin oil

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Method of Preparation of Lipsticks

Formula

Color	%	Wax & Oils &	%	Other ingredients	%
Eosin	2%	Beeswax	20%	Methyl paraben	0.8%
Eosol	22%	Lanolin	10%	Propyl paraben	0.2%
Titanium dioxide	8%	Ozokerite	6%		
Solvent		Cetyl alcohol	2%		
Polyethylene Glyco	10%	Liquid Paraffin	10%		
		Castor Oil	10%		

- Colouring agent is **dissolved** in Solvent. Then add other ingredients in solution and mix well.
- Wax and fats are **melted** separately. The melted base added to the dye stuffs.
- The whole contents are **milled** for several times to get smooth appearance
- Vaccum is applied to remove air.
- Perfume is added to the mass and **poured** into the moulds
- Moulds are chilled. By this sticks are formed.

DEFECTS IN LIPSTICKS

Formulation related

- **Sweating:** Due to high oil content or inferior oil blending capacity
- **Bleeding:** Separation of color from waxy base
- **Blooming:** Dull appearance instead of glossy appearance
- **Streaking:** Thin line of different color appears to the surface of finished products

Mould related

- **Laddering:** Ladder like appearance after congealing and setting due to uneven melting and cooling
- **Deformation:** Deformed structure appear on sides of lipsticks
- **Catering:** Dimples or spots appeared on the surface of lipstikcs.
- **Mushy failure:** Central core of stick are not strong enough to hold the base.

EVALUATION OF FINISHED PRODUCTS

- **Color Control:** Dispersion of pigment is checked stringently. It is checked by Calorimetric equipment. This provides the numerical reading of color shades. Matching the colour shades visually.
- **Melting Point:** Lipstick base should have melting point 55 C to 75C. It is measured by capillary tube temperature method.
- **Softening Point:** Lipstick should be resistant to varying temp both hot and cold weather. It is measured by Ring and Ball method.
- **Microbial testing:** Known amount of mass is placed in two culture media and analysed for suitable growth of bacteria and fungi. Limit is NMT 100 microorganism per gram.
- **Rancidity:** Rancidity is due to decomposition of fats, oils and lipids by hydrolysis or oxidation. It leads to color change, bad odour and taste. It is determined by its peroxide number
- **Breaking Load Test:** To find out the value of maximum load that a lipstick can withstand before it breaks.
- Rupture test: Breaking or rupturing of lipstick is measured when it is placed

SHAMPOOS

- Shampoos are cleansing agents containing synthetic detergents with various additives. After shampooing, it leaves the hair soft, nonsticky and free from oils, dirt, dandruff, pollutants and contaminant particles.

Functions of Shampoo:

- Cleaning agent - Removes dust and excess oils from the hair.
- Anitseborrhoeic agent - Agents used to prevent excessive secretion of sebum
- Antidandruff agents - This will treat dandruff and pruritis which are associated with fungal infections.
- Keratolytic agents - They remove the hard scales from the scalp.

Ideal properties

- Easily soluble even in hard water
- Easy spreading; no damage to hair, low toxicity, minimum eye irritation
- Good foaming ability
- Slightly acidic. Since basic environment weakens the hair by breaking disulfide

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FORMULATION OR COMPOSITION OF SHAMPOO:

- **Detergents:** Used to clean the hair. Surfactants like Anionic surfactants (Sodium Lauryl sulphate, Alkyl polyethylene glycol sulphates, alpha olefin sulphate), Non ionic surfactant (Amineoxides, Fatty acid alkanolamides), Cationic surfactants (Alkyl amines, Ethoxylated amines, Alkyl betains), Amphoteric surfactants.
- **Foam Boosters:** Stabilize the foam produced by surfactants Eg. Fatty acid alkanolamides, amine oxides.
- **Disinfectants and Germicides:** Used to prevent itching caused by bacteria. Eg: Hexachlorphene, Dichlorophene
- **Antidandruff agents:** To prevent formation of scaly scurf on skin under the hair Eg: Benzalkonium chloride, Cetrimide, Hyamines
- **Conditioning agents:** Gives smoothness and softness to the hair. Also known as pearlescent agents. Eg: Lanolin, Mineral oils, aminoacids
- **Preservatives:** Prevent microbial growth Eg: Parabens, PMN, PMA
- **Sequestering agent:** Prevent the calcium and magnesium like salts present in water which deposit on the hair Eg: EDTA, Pyrophosphates
- **Coloring agent:** Give attractive appearance to the formulation. Eg: Water soluble colours

PREPARATION OF SHAMPOO: (Antidandruff Shampoo)

- Dissolve Part A in Water, heat at 40 C
- Dissolve Part B in water, heat at 40 C
- Mix these two phase at same temperature
- Make up the volume with water and mix well
- Cool the mixture and add perfume

EVALUATION/ QUALITY CONTROL TEST OF SHAMPOO

- Determination of pH
- Determination of solid content
- Foam Formation, Foam Quality and Retention test
- Viscosity
- Dirt dispersion
- Skin and Eye irritation test

FORMULA
Part A
Triethanolamine lauryl sulphate
Lauric monoethanolamide
Preservative
Color
Water
Part B
Hexachlorophane
Water
Part C
Water
Perfume

COLD CREAM

- This will produce smooth skin and also remove makeup. It produces cooling effect because slow evaporation of water present in emulsion. It is Water in oil type of emulsion

FORMULATION OR COMPOSITION

- Base: It melts at 70 °C and form smooth cream at room temperature when it mixed with suffecient amount of water Eg: Stearic acid, Cetosteryl alcohol, Cetomacrogol
- Emulsifying agent: Spans, Polysorbates
- Alkalis: Borax, Sodium hydroxide and Potassium hydroxide
- Preservatives: Parabens, Sodium Benzoate, Boronpol
- pH modifier: Sodium hydroxide, lactic acid

METHOD OF PREPARATION

- Melt Oil soluble ingredients at 70 °C
- Dissolve water soluble ingredients and heat at 70 °C
- Mix oil phase and water phase at same temperature and mix well
- Borax reacts with fatty acids from waxes and oils and forms soap which act as self emulsifying agent
- Cool the mixture and add perfume

EVALUATION

- Viscosity, Skin irritation

FORMULA
Oil Soluble ingredients
Bees Wax
Minera Oil
Paraffin Wax
Cetyl alcohol
Water Soluble ingredients
Borax
Preservative
Water
Perfume

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VANISHING CREAM

- These are referred as Day creams. This provide emollient and protective action to the skin by forming occlusive film on the skin.
- They are oil in Wate type of emulsion. When applied on the surface of skin, it will disappear immediately and form thin film which is not visible to naked eye. Hence it is known as Vanishing cream.

FORMULATION OF VANISHING CREAM

- Main ingredient: Stearic acid, water and soap are basic constituents of stearate based creams. Soap is formed in-situ by the reaction between suitable alkali and stearic acid.
- Humectants: It prevents excessive drying out of cream. Eg: Glycerin, Sorbitol and propylene glycol
- Alkali: Potassium hydroxide, Borax, Sodium hydroxide, Sodium carbonate, Triethanolamine
- Emulsifying agent: Polysorbates, spans
- Preservatives: Parabens, Benzoates
- Perfume: Lavener oil, Terpineol, Sandal wood oil
- Purified Water

PREPARATION OF VANISHING CREAM

- Stearic acid is melted to 70C
- KOH, Methyl paraben, Glycerin dissolved in water and heated to 70C
- Two phases are mixed at same temperature and mix well
- Cool the mixture to 50 C and add the perfume.

Formula
Water Soluble ingredients
Stearic acid
Oil soluble ingredients
Glycerin
Methyl paraben
KOH

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TOOTH PASTES:

- It is a paste or gel dentrifice used with tooth brush to clean and remove the food debris and plaque adhere to the surface of the teeth.

Formulation or Compostion of Tooth paste

- Abrasives: Used to clean and polish the teeth and remove the debris. Eg: Calcium carbonate (Precipitated chalk), Dicalcium phosphate dihydrate, Tricalcium phosphate.
- Detergents: Used to produce foam and reduce the surface tension of adherents and staining. Eg: S.S, Sodium N laury Sarcosinate
- Humectants: Prevents drying of formulation. Eg: Glycerin, Sorbitol, Propylene glycol
- Binders: Give good consistency to the preparation. They provide protective colloidal effect stabilises and thicken the preparation. Eg: Tragacanth, Acacia, Carboxymethyl cellulose, Guar gum, Carageenan etc.
- Flavoring agents: They give good flavor and freshness to the preparation. Eg: Peppermint oil, Lavendar oil, Clove oil, Menthol
- Sweetening agents: Give pleasant taste to the preparation. Eg: Saccharine, Sodium cyclamate
- Preservatives: Binding agent in the form of mucilage will support microbial growth. To prevent microbial growth, preservatives are added. Eg: Parabens, Formalin, Benzoates
- Corrosion inhibitor: To prevent corrosion to the aluminium tube, Sodium silicate, silica are added.

PREPARATION OF TOOTH PASTE

- Glycerol + Sorbitol + Preservative + SCMC → Mucilage
- Add Sod. Saccharine → Mass
- Abrasive + SLS → Mass
- Add mineral oil, peppermint oil to above solution

Tooth paste as Therapeutic agent

- Anticaries agent - Fluoride
- Antiplaque agent - Triclosan, SLS, Zn,Sn ions
- Anticalculus agent - Pyrophosphate, Zinc
- Antidentine hypersensitivity agent - Potassium salts
- Whitening agents - Dimethicone, Papain

EVALUATION OF TOOTH PASTE

- Test for abrasiveness
- Particle size
- Cleansing property
- Test for flouride

FORMULA
Abrasives - 20-40%
Calcium Carbonate
Dicalcium Phosphate
Detergent and Binder - 1-2%
Sodium lauryl sulphate
Sodium carboxy methy cellulose
Sweetener & Preservative 1-2%
Sodium Saccharine
Methyl Paraben
Humectants - 20-40%
Glycerin
Sorbitol
Mineral oil
Water - 20%

HAIR DYES

- These are colourants or the cosmetic preparations which are used to change the natural hair color and to mask the greying of hair

Ideal properties

- Color distribution should be even
- Should not damage the hair and scalp
- Should remain for longer duration
- Natural moisture of hair should be retained

Formulation depends on the Classification of hair dye:

1. Temporary hair colourants
2. Semi permanent hair colourants/ Direct dyes
3. Oxidative dyeing systems
4. Gradual hair colorants
5. Natural dyes

Temporary hair colorants:

- They are leave on preparation, not rinsed after application.
- Absorbed into the cuticle and cannot enter into the cortex of hair.

Semipermanent Hair Colourants/ Direct dyes:

- Retain color for longer duration.
- Doesnot contain H_2O_2 and so it doesnt get bleached
- Composition of semipermanent hair colorants are
- Dye - O nitro anilines, Aminonitrophenols & their ethers, Azo dyes, Nitrodiphenylamine, Anthroquinone
- Aliphatic primary amines, Fatty acid, Thickener, Surfactant
- Water, Organic solvent,Perfume

Oxidative Dyeing Systems

- Also called Para dyes. Colorants are based on chemical reaction, produces color.
- Mostly oxidation, coupling and condensation reactions involved
- Composition are,
- Dyes - Aromatic compounds, Resorcinol, m-phenylene diamine, Diaminoanisole, hydrogen peroxide
- Vehicles - Water, Ethyl alcohol, Glycerine, Ethylene glycol monostearate
- Alkalis - Oxidation dyes are active in alkaline medium Eg: Ammonium hydroxide, Amm. Carbonate, Mono ethanol amine, Guanidine or Arginine, Diethanol amine
- Oxidizing agent - Induces the oxidation reaction with hair Eg: Ferric chloride, $KMnO_4$, H_2O_2

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Gradual Colourant:

- This colorants require several applications on hairs to achieve required darkness
- It contains heavy metals like Lead, Bismuth salts in their composition
- But it produces negative effect on health

Natural dyes:

- Plant contain color pigments, which are used as Hair colorants
- It has very less side effects
- Henna: Leaves are powdered and it is mixed with water to form paste. It gives reddish to reddish brown color to the hair. Active constituent is 2 hydroxy 14 napthoquinone (Lawsone). Indigo leaves or synthetic indigo is added to henna to alter the color
- Chamomile: Flowers of chamomile are used to obtaine the colour. Powder is mixed with hot water to form paste. Navy blue color is achieved

Preparation or Manufacturing of Hair dye:

- Dye chemicals premixed with hot water
- Other ingredients like alkalis, surfactants, oxidizing agent, viscosity enhancer and buffers are dissolved in suitable solvents
- Dye Premix and Other mixtures are pumped in to manufacturing vessel and mix well.
- Remaining volume is makeup with water

EVALUATION

- pH, Viscosity
- Assay for H2O2

SUNSCREENS

- It is a lotion or spray or gel that absorbs or reflects the sun's ultraviolet radiation and prevents the damaging effect of it.
- They can be used as Sunblock or sunscreens
- UV rays damage the skin cells and DNA in the form of Sagging, Wrinkling and Photo carcinogenesis
- UV light is artificially divided into 3 ranges
- UVA → 320-400 nm → Low energy → prevented by Ozone layer, doesnot reach the earth
- UVB → 290-320 nm → High Energy → Cause more immediate damage (Sun burn, Skin cancer)
- UVC → 100-290 nm → Very High Energy → DNA Damage

Mechanism or Principle of Sunscreens

- By reflecting or absorbing UV rays. Eg: ZnO and TiO2
- Filter the mid range UV rays (UVB). But allow the other range. All suntan preparations based on this principle. Eg: Chromophores, Inorganic particles
- Biologically active substances which prevents inflammation due to rays. Antihistamines substances are used to prevent inflammation

Ideal properties:

- Should be safe, chemically inert, non irritating and non toxic, Stable to heat, light and perspiration
- Retain the sunscreen property for several hours, Non stain and not be absorbed into the skin.
- Absorb UV rays in wide range

Classification of Sunscreens

- Physical preparation: Opaque formulation contains TiO2, Talc, Kaolin, Zinc oxide, Ferric chloride, Which reflects the UV radiation due to large particle size
  Chemical Preparation: It contains PABA and its esters, Benzophenones, Cinnamates, Salicylates, Anthranilates which absorb UV radiation

SPF and Important of SPF

- SPF - Sun Protection Factor = Minimal Erythymeal dose for Product applied Protected Skin (MED - PS) / Minimal Erythmeal dose for Product not applied unprotected Skin (MED - US)
- Types of SPF

Type	Description	SPF Number	Character
I	Burn the skin easily & never tans	>8	Sensitive
II	Burns the skin easily & minimum tan	6-7	Sensitive
III	Burn moderately & tan gradually	4-5	Normal
IV	Burn minimally & tans well	2-3	Normal

- Suitable base may be Aqueous, Alcoholic, Fats, Natural oils coconut oil, peanut oil, olive oil have absorption ability of UV light.
- Antioxidants also used in the preparation

Preparation or Manufacturing of Sunscreen: The product can be

- Aqueous or Oil type: Mixing and Dissolving the sunscreen and other ingredients in vehicle (Water and Oil). Perfume added atlast
- Cream type: These are emulsion type.
- Lotions type: These are solution type or emulsion type
- Gel type: Solution based Viscous preparation.

Preparation:

- Cetyl alcohol + Benzophenone + Ethyl hexyl methoxy cinnamate + Stearic acid + Glycerin + Stearyl Dimethicone Silicate → Melt in beaker
- Water + Triethanolamine → Taken in beaker → Heat to 80-85C
- Melted content is addded to the hot water solution slowly and stirred well
- Mixture is cooled to get uniform smooth cream

FORMULA
Cetyl alcohol - 2%
Benzophenone - 1.5%
Ethyl hexyl methoxy cinnamate - 1.5%
Stearic acid - 4%
Glycerin - 2%
Triethanolamine - 1%
Water - 78%
Stearyl Dimethicone Silicate - 10%