BP702T · B.Pharm Semester VII · Theory Notes

Cosmetics and Cosmeceuticals

Unit III — Hair Cosmetics (6 hours)

Unit III (6 hours)

Pills & Python Notes

From-zero teaching standard: every technical term is defined before use.

Syllabus coverage: Unit III (6 hours).

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CHAPTER 6: Common Hair Problems and Hair Cosmetics Overview

1. Learning Objectives

After studying this chapter, you will be able to:

- Name the common hair problems: dandruff, hair fall, dry hair, oily hair, split ends, premature greying, and lice.
- Describe what each hair problem is, its common causes, and its visible signs in simple words.
- Understand the basic structure of hair and scalp needed to make sense of these problems.
- List the main categories of hair cosmetics and cosmeceuticals (shampoo, conditioner, hair oil, hair serum, hair colour, depilatory, shaving products).
- State the one-line role of each hair cosmetic category.
- Explain the difference between a hair cosmetic and a hair cosmeceutical in simple words.
- Answer short, long, MCQ, viva, and application-based exam questions on this topic.

2. Definitions

- **Hair:** A thin thread-like structure growing from the skin, made mainly of a protein called keratin. Each hair grows from a small pocket in the skin called a hair follicle.
- **Scalp:** The skin on the top of the head from which hair grows. A healthy scalp is the base for healthy hair.
- **Hair follicle:** The tiny pocket or sac in the skin where each hair root sits and from which the hair grows.
- **Keratin:** The strong protein that hair (and nails) are made of. It gives hair its strength.
- **Dandruff:** A common scalp condition in which small white or greyish flakes of dead skin fall from the scalp, often with itching.
- **Hair fall (hair loss):** Losing more hair than normal, seen as extra hair on the comb, pillow, or in the drain, or as thinning of hair on the scalp.
- **Dry hair:** Hair that feels rough, dull, and difficult to comb because it lacks enough natural oil and moisture.
- **Oily hair:** Hair that looks greasy and flat soon after washing because the scalp produces too much natural oil (sebum).
- **Sebum:** The natural oil produced by oil glands (sebaceous glands) in the skin. A thin layer of sebum keeps hair soft, but too much makes hair oily.
- **Split ends:** A condition where the tip of a hair strand splits into two or more parts, like a frayed rope end.

- **Premature greying:** Hair turning grey or white at an early age, much before old age.
- **Lice (head lice):** Tiny insects that live on the scalp and hair, feed on blood from the scalp, and cause itching. Their eggs are called nits.
- **Hair cosmetic:** A product used to clean, beautify, or groom the hair (for example, shampoo, hair oil).
- **Hair cosmeceutical:** A hair product that is a cosmetic but also contains active ingredients aimed at a specific hair or scalp concern (for example, an anti-dandruff shampoo). The word comes from "cosmetic" + "pharmaceutical."
- **Shampoo:** A cleansing liquid (or powder) used to wash dirt, oil, and flakes from the hair and scalp.
- **Conditioner:** A product applied after shampooing to make hair soft, smooth, and easy to comb.
- **Hair oil:** An oil-based product massaged into the hair and scalp to soften hair and give shine.
- **Hair serum:** A light, usually silicone-based liquid applied to hair to give shine, smoothness, and frizz control.
- **Hair colour (hair dye):** A product used to change the colour of hair, for example to cover grey hair.
- **Depilatory:** A product used to remove unwanted hair from the body by dissolving it at the skin surface.
- **Shaving products:** Products used along with shaving — for example, shaving cream (softens hair and protects skin during shaving) and after-shave (used after shaving for a fresh feeling).

3. Terminology Table

Term	Simple Meaning
Keratin	The protein hair is made of; gives hair strength
Follicle	Tiny skin pocket from which each hair grows
Scalp	Skin of the head where hair grows
Sebum	Natural oil of the scalp; too little = dry hair, too much = oily hair
Dandruff	White/grey flakes falling from the scalp, often with itching
Hair fall	Losing more hair than normal; thinning
Split ends	Hair tip splitting into two or more parts
Premature greying	Greying of hair at an early age
Lice / nits	Tiny scalp insects / their eggs; cause itching
Cosmetic	Product for cleaning or beautifying
Cosmeceutical	Cosmetic with active ingredients aimed at a specific concern
Shampoo	Hair and scalp cleanser
Conditioner	Post-shampoo softener and detangler
Hair oil	Oil for softening and shine
Hair serum	Light liquid for shine and frizz control
Hair colour	Product that changes hair colour

Term	Simple Meaning
Depilatory	Product that removes unwanted body hair by dissolving it
Frizz	Hair that looks rough, puffy, and flyaway instead of smooth

4. Simple Explanations

4.1 Basic hair structure (only what you need)

To understand hair problems, you need only three simple ideas:

1 Each hair grows from a **follicle** (a tiny pocket) in the **scalp** (head skin).

2 The hair strand itself is made of **keratin** protein and is covered by overlapping tiny scales called the **cuticle** — like tiles on a roof. When the cuticle lies flat, hair looks smooth and shiny; when it is raised or damaged, hair looks rough and dull.

3 Oil glands near each follicle release **sebum** (natural oil) that coats the hair lightly and keeps it soft.

Most hair problems are problems of the scalp (dandruff, lice, oily scalp), the oil balance (dry or oily hair), the hair tip (split ends), the hair colour (greying), or the amount of hair (hair fall).

4.2 Dandruff — what it is, causes, and signs

What it is: Dandruff is a condition where dead skin from the scalp sheds as visible white or greyish flakes. A little shedding of dead skin is normal and invisible; in dandruff, the shedding is faster and the flakes become visible, often falling on the shoulders.

Common causes (described simply): dry scalp, oily scalp with yeast-like microorganisms growing more than usual, not washing hair often enough (oil and dead skin build up), washing too harshly, cold dry weather, and stress. It is not caused by poor character or by simple dirt alone — it is a scalp-shedding problem.

Signs: white/grey flakes on the scalp, hair, and shoulders; itching of the scalp; sometimes redness of the scalp.

4.3 Hair fall — what it is, causes, and signs

What it is: Every person loses some hair daily (old hairs fall and new ones grow) — that is normal. **Hair fall** means losing clearly more hair than normal, so that thinning becomes noticeable.

Common causes (described simply): stress, illness or fever, poor diet (lack of protein, iron, vitamins), hormonal changes (for example after childbirth), harsh chemical treatments or tight hairstyles that pull hair, certain medicines, and family tendency (pattern thinning that runs in families).

Signs: more hair than usual on the comb, pillow, or bathroom drain; visible thinning on the scalp; a wider hair parting line.

4.4 Dry hair — what it is, causes, and signs

What it is: Hair that lacks enough natural oil and moisture, so it feels rough instead of soft.

Common causes: too little sebum production, washing with very hot water or harsh shampoos too often, chemical treatments (colouring, straightening), too much sun exposure, and not conditioning after washing.

Signs: rough texture, dull look (no shine), tangles easily, difficult to comb, sometimes with split ends.

4.5 Oily hair — what it is, causes, and signs

What it is: Hair that becomes greasy and flat quickly after washing because the scalp makes too much sebum.

Common causes: overactive oil glands, hormonal changes (common in teenage years), washing too rarely, using very heavy oily products, and hot humid weather.

Signs: greasy look and feel soon after washing, hair sticking together in clumps, flat limp appearance, sometimes with an oily scalp and dandruff together.

4.6 Split ends — what it is, causes, and signs

What it is: The tip of a hair strand splits lengthwise into two or more thin parts, like the frayed end of an old rope. Once split, the split can travel upward along the strand.

Common causes: dryness, rough combing (especially of wet hair), heat styling, chemical treatments, and not trimming hair for a long time (old ends become weak).

Signs: hair tips that look forked or feathery when seen closely; rough, thin-looking ends; more tangling at the ends.

4.7 Premature greying — what it is, causes, and signs

What it is: Hair gets its colour from a pigment called **melanin**, made by cells in the follicle. With age, these cells slowly make less melanin and hair turns grey/white. **Premature greying** means this happens much earlier than usual — in young adulthood or even teenage years.

Common causes (described simply): family tendency (the strongest factor — it often runs in families), stress, poor nutrition (lack of certain vitamins and minerals), and smoking. It is not caused by plucking one grey hair.

Signs: grey or white hair strands appearing at an early age, usually first at the temples or side areas.

4.8 Lice — what it is, causes, and signs

What it is: Head lice are tiny wingless insects (about the size of a sesame seed) that live on the scalp, bite the scalp to feed on blood, and lay eggs called **nits** that stick firmly to hair strands near the scalp.

Common causes: close head-to-head contact with a person who has lice, or sharing combs, caps, towels, or pillows. Lice do not jump or fly, and they are not a sign of being unclean — anyone can get them, especially schoolchildren.

Signs: strong itching of the scalp (especially behind the ears and at the back of the neck), tiny eggs (nits) stuck to hair near the scalp that look like dandruff flakes but cannot be flicked off easily, and sometimes small red bite marks on the scalp.

4.9 Overview of hair cosmetics and cosmeceuticals

Hair products fall into two broad groups:

- **Hair cosmetics** clean, soften, style, or colour the hair — their job is cleansing, beauty, and grooming.
- **Hair cosmeceuticals** look like cosmetics but also contain **active ingredients** aimed at a specific problem — for example, an anti-dandruff shampoo contains an active ingredient aimed at controlling dandruff flakes. The product is still a cosmetic (not a medicine), but it does a targeted job.

The main categories, each with its one-line role:

Category	One-line role
Shampoo	Cleans hair and scalp by removing dirt, oil, and flakes
Conditioner	Softens hair after shampooing; makes combing easy
Hair oil	Massaged into hair/scalp for softness, shine, and grooming
Hair serum	Light liquid for shine, smoothness, and frizz control
Hair colour	Changes hair colour (e.g., covers grey hair)
Depilatory	Removes unwanted body hair by dissolving it at the skin surface
Shaving products	Help safe, comfortable shaving (shaving cream) and freshen skin after shaving (after-shave)
Herbal hair care products	Hair products based on plant ingredients, used in products aimed at traditional hair-care concerns

5. Classifications

5.1 Common hair problems (by the part affected)

1. **Scalp problems:** dandruff (flaking + itching), lice (insects + itching).
2. **Oil-balance problems:** dry hair (too little oil/moisture), oily hair (too much sebum).
3. **Hair-strand problems:** split ends (damaged tips), hair fall (excessive shedding/thinning).
4. **Colour problems:** premature greying (early loss of melanin pigment).

5.2 Hair problems (by nature — simple grouping for study)

Group	Problems included
Flaking/itching of scalp	Dandruff, lice
Oil and moisture imbalance	Dry hair, oily hair
Damage and loss	Split ends, hair fall
Pigment change	Premature greying

5.3 Hair cosmetics and cosmeceuticals (by purpose)

1. **Cleansing:** shampoos (including dry shampoo, baby shampoo, anti-dandruff shampoo).
2. **Conditioning and softening:** conditioners, hair oils, hair serums.
3. **Colouring:** hair colours (temporary, semi-permanent, permanent types — introduced here, detailed in higher study).
4. **Hair removal:** depilatories (chemical hair removers), shaving products (shaving creams, after-shaves).
5. **Herbal hair care:** products based on plant materials, used in products aimed at traditional concerns like dryness or dullness.

6. Mechanisms and Processes

6.1 How dandruff flakes form (simple process)

```
Scalp skin renews itself
    → In dandruff, renewal is faster than normal
    → Dead skin cells shed in visible clumps (flakes)
    → Oil + yeast-like microorganisms on scalp can increase the flaking
    → Result: white/grey flakes + itching
```

6.2 How hair fall happens (simple process)

```
Normal cycle: hair grows → rests → falls → new hair grows from the same follicle
    → In hair fall, more hairs than normal enter the "fall" stage together
       (triggered by stress, illness, poor diet, hormones, harsh pulling)
    → Shedding exceeds regrowth for some time
    → Result: noticeable thinning
```

6.3 How split ends form (simple process)

```
Healthy hair tip: cuticle scales lie flat, tip is sealed
    → Damage (dryness, rough combing, heat, chemicals) lifts and breaks the cuticle
    → The unprotected tip frays and splits into two or more parts
    → The split can travel upward if the end is not trimmed
```

6.4 How greying happens (simple process)

```
Follicle cells make melanin pigment → pigment colours the growing hair
    → With time (or early, in premature greying), pigment cells make less melanin
    → New hair grows with little or no pigment
    → Result: grey/white hair
```

6.5 How the main hair product categories work (one-line mechanisms)

- **Shampoo:** Surfactants (cleaning agents) surround dirt and oil and rinse them away with water.
- **Conditioner:** Conditioning agents coat the hair surface, smooth the cuticle scales, and reduce friction so combing is easy.
- **Hair oil:** Oil coats the strand, reduces dryness, and gives shine.
- **Hair serum:** Light silicones form a thin smooth film that controls frizz and adds shine.
- **Hair colour:** Colouring molecules deposit on or inside the hair to change its colour.
- **Depilatory:** Alkaline chemicals soften and dissolve the hair protein at the skin surface so hair can be wiped away.
- **Shaving cream:** Softens the hair and gives a slippery layer so the razor glides without cutting the skin.

7. Textual Diagrams and Flowcharts

7.1 Hair problems map

```
COMMON HAIR PROBLEMS
    ├── Scalp problems
    │       ├── Dandruff → flakes + itching
    │       └── Lice → insects + nits + itching
    ├── Oil/moisture imbalance
    │       ├── Dry hair → rough, dull, tangles
    │       └── Oily hair → greasy, flat, limp
    ├── Damage and loss
    │       ├── Split ends → forked tips
    │       └── Hair fall → excessive shedding, thinning
    └── Colour change
            └── Premature greying → early loss of melanin
```

7.2 The hair strand (simple cross-view)

```
        ┌──────────────────────┐
        │ CUTICLE (outer scales,│
        │ like roof tiles)      │
        │  ┌──────────────────┐ │
        │  │ CORTEX (main body,│ │
        │  │ keratin + melanin │ │
        │  │ colour pigment)   │ │
        │  └──────────────────┘ │
        └──────────────────────┘
  Flat cuticle = smooth, shiny hair
  Raised/damaged cuticle = rough, dull hair
```

7.3 Hair product categories at a glance

```
HAIR COSMETICS & COSMECEUTICALS
    ├── Clean      → Shampoo (washes dirt, oil, flakes)
    ├── Soften     → Conditioner, Hair oil, Hair serum
    ├── Colour     → Hair colour (covers grey, changes shade)
    ├── Remove     → Depilatory (dissolves hair), Shaving products
    └── Herbal     → Plant-based products for traditional hair-care concerns
```

8. Infographic Concept Box

INFOGRAPHIC CONCEPT: "Know Your Hair Problem" — a head silhouette divided into zones with callout icons: scalp zone shows flake icons (dandruff) and tiny insect icons (lice); a hair strand shows a forked tip (split ends) with a magnifier; an oil-drop icon marks the scalp for oily hair and a cracked-earth icon for dry hair; a falling-hair icon shows hair fall; a half-grey strand shows premature greying. Each icon connects to a one-line "what it is" label and a matching product-category icon (shampoo bottle, conditioner tube, oil bottle). Caption: "Match the sign to the problem — then match the problem to the right product category."

9. Tables

Table 9.1: Common hair problems — what, causes, signs

Problem	What it is (simple)	Common causes	Visible signs
Dandruff	Visible flakes of dead scalp skin	Fast skin shedding; oily scalp with yeast-like growth; infrequent or harsh washing; dry cold weather; stress	White/grey flakes on scalp, hair, shoulders; itching
Hair fall	Losing clearly more hair than normal	Stress; illness/fever; poor diet; hormonal changes; tight hairstyles; harsh chemicals; family tendency	Extra hair on comb/pillow/drain; thinning; wider parting
Dry hair	Hair lacking oil and moisture	Too little sebum; overwashing; hot water; harsh shampoo; chemicals; sun; no conditioning	Rough, dull, tangled, hard to comb
Oily hair	Hair greasy soon after washing	Overactive oil glands; hormones; rare washing; heavy oily products; humid weather	Greasy look, flat limp hair, strands sticking together
Split ends	Hair tip split into two or more parts	Dryness; rough combing of wet hair; heat; chemicals; long gap without trimming	Forked/feathery tips; rough thin ends
Premature greying	Greying much earlier than old age	Family tendency; stress; poor nutrition; smoking	Grey/white strands at young age, often at temples first
Lice	Tiny insects on scalp; eggs (nits) on hair	Head-to-head contact; sharing combs/caps/towels	Strong itching; nits stuck near scalp that don't flick off easily

Table 9.2: Hair cosmetic categories — one-line roles

Category	One-line role	Used when (simple)
Shampoo	Cleans hair and scalp	Regular washing; removes dirt, oil, flakes
Conditioner	Softens and detangles after shampoo	After every shampoo for smooth combing
Hair oil	Softens hair, gives shine	Dryness, grooming, traditional head massage
Hair serum	Controls frizz, adds shine	Frizzy or dull hair needing smoothness
Hair colour	Changes hair colour	Covering grey hair; changing shade
Depilatory	Removes unwanted body hair	Hair removal without a razor
Shaving products	Aid comfortable shaving	Shaving cream before/during; after-shave after
Herbal hair care	Plant-based care for traditional concerns	Users preferring herbal products

Table 9.3: Cosmetic vs. cosmeceutical (hair)

Feature	Hair cosmetic	Hair cosmeceutical
Main job	Clean, beautify, groom	Clean/beautify + targeted action on a concern
Active ingredient for a problem	Usually not present	Present (e.g., anti-dandruff active)
Example	Plain shampoo	Anti-dandruff shampoo
Claim style	General ("cleans hair")	Targeted ("used in products aimed at controlling dandruff")

10. Examples

1 **Dandruff example:** A student notices white flakes on her dark school uniform shoulders and an itchy scalp — classic signs of dandruff.

2 **Hair fall example:** A young man finds much more hair than usual on his pillow every morning for several weeks after a period of heavy stress — hair fall linked to stress.

3 **Dry hair example:** A woman who colours her hair frequently and washes with very hot water finds her hair rough, dull, and full of tangles — dry, damaged hair.

4 **Oily hair example:** A teenager's hair looks greasy and flat by evening even though it was washed in the morning — oily hair from active oil glands.

5 **Split ends example:** On close look, the ends of long untrimmed hair look like tiny forks — split ends.

6 **Premature greying example:** A 22-year-old notices grey strands at the temples although his parents greyed early too — premature greying with family tendency.

7 **Lice example:** A schoolchild scratches her head constantly; her mother finds tiny eggs stuck firmly near the scalp behind the ears — nits of head lice.

8 **Product-match example:** Flakes + itching → anti-dandruff shampoo (cosmeceutical); rough tangled hair after wash → conditioner; grey coverage → hair colour; unwanted underarm hair → depilatory or shaving product.

11. Analogies

1 **Cuticle = roof tiles.** Flat overlapping tiles keep rain out and look neat (smooth shiny hair). Broken, lifted tiles look rough and let damage in (raised cuticle = dull rough hair).

2 **Dandruff = fast-shedding paint.** Normal scalp sheds invisibly like slow paint wear; dandruff is like paint peeling off in visible flakes because the renewal is too fast.

3 **Sebum = natural hair oil from a tiny tap.** A slightly open tap keeps hair soft (normal); a tap left wide open floods the hair (oily hair); a nearly closed tap leaves hair dry (dry hair).

4 **Split ends = frayed rope.** An old rope frays at its end into separate threads — exactly what happens to a damaged hair tip.

5 **Melanin = ink in a pen.** The follicle is like a pen filling each growing hair with ink (melanin). When the ink runs low, the hair comes out grey — like writing with a drying pen.

6 **Lice nits = glued beads.** Nits stick to hair like tiny beads glued near the scalp — that is why they cannot be flicked off like dandruff flakes.

7 **Shampoo vs. conditioner = washing vs. ironing clothes.** Shampoo washes the "cloth" (hair) clean; conditioner smooths it like ironing, so it lies neat and combs easily.

12. Pharmacy Relevance

- Pharmacies sell shampoos, conditioners, hair oils, hair colours, depilatories, and anti-dandruff products, so pharmacists must understand what each category does.
- **Right product guidance:** A pharmacist who can match signs to problems (flakes + itching → anti-dandruff shampoo; forked tips → trimming + conditioning care) gives genuinely useful advice.
- **Safety counselling:** Hair colours and depilatories contain strong chemicals — a pharmacist can advise a patch test (small skin test before full use) and following the label time strictly.
- **Lice counselling:** Pharmacists can explain that lice spread by contact, not by uncleanliness, and advise treating close contacts and washing shared combs and pillow covers in hot water.
- **When to refer:** Heavy, sudden, or patchy hair loss, or a painful/infected scalp, should be referred to a doctor (dermatologist) rather than handled with cosmetics alone.
- **No false promises:** Pharmacists must not claim a cosmetic "cures" hair fall or "regrows" hair — the correct wording is "used in products aimed at..." a concern.

13. India Context

- **Hair oiling** (champi) is a deep-rooted Indian tradition — regular head massage with coconut or other oils, passed down in families for generations.
- **Herbal hair care** is hugely popular in India: products based on amla, shikakai, reetha, henna, and bhringraj are used in products aimed at traditional concerns like dryness, dullness, and premature greying.
- **Henna (mehndi)** has been used in India for centuries as a natural hair colour and conditioner.
- In India's hot, humid, and dusty climate, **frequent washing needs and oily-scalp concerns** are very common, making mild shampoos a daily-use product for many.
- **Lice** are commonly seen in Indian schoolchildren; awareness that lice spread by head-to-head contact (not by uncleanliness) helps reduce stigma.
- Long hair is culturally valued in India, which makes **split-end care and trimming advice** especially relevant.

14. Key Points

- Hair = keratin protein growing from follicles in the scalp; sebum is the scalp's natural oil.
- Seven common hair problems: dandruff (flakes + itching), hair fall (excessive shedding), dry hair (rough, dull), oily hair (greasy, flat), split ends (forked tips), premature greying (early melanin loss), lice (insects + nits + itching).
- Most problems are identified by visible signs: flakes, itching, greasiness, roughness, forked tips, thinning, early grey strands.
- Hair cosmetics clean/beautify/groom; hair cosmeceuticals also contain actives aimed at a specific concern (e.g., anti-dandruff shampoo).

- Categories and one-line roles: shampoo (cleanse), conditioner (soften/detangle), hair oil (soften/shine), serum (frizz control/shine), hair colour (change colour), depilatory (dissolve unwanted hair), shaving products (aid shaving).
- A pharmacist matches the signs to the problem and the problem to the right category — without making cure claims.

15. Common Confusions

1 **Dandruff vs. lice nits:** Dandruff flakes flick off easily; nits are glued firmly to the hair near the scalp and do not flick off. Itching happens in both, so check the flakes.

2 **Normal shedding vs. hair fall:** Losing some hair daily is normal (old hairs make room for new ones). Hair fall means clearly *more* than normal with visible thinning.

3 **Dry scalp vs. dry hair:** Dry scalp is a skin condition (may flake); dry hair is a strand condition (rough, dull). A person can have an oily scalp with dry hair ends.

4 **Cosmetic vs. cosmeceutical:** A plain shampoo is a cosmetic; an anti-dandruff shampoo with an active ingredient aimed at flakes is a cosmeceutical. The difference is the targeted active, not the price.

5 **Depilatory vs. shaving:** A depilatory dissolves hair chemically at the skin surface (no blade); shaving cuts hair with a blade. Both remove hair above the skin only.

6 **Premature greying cause:** It is mainly family tendency, not caused by plucking a grey hair or by one stressful week alone.

16. Common Mistakes

1 **Combing wet hair roughly:** Wet hair is weak and stretches easily — rough combing causes breakage and split ends. Detangle gently, starting from the ends.

2 **Using an anti-dandruff shampoo like a daily cosmetic shampoo forever without need:** Once flakes are under control, switch to a mild regular shampoo unless the concern returns; always follow label directions.

3 **Applying conditioner to the scalp:** Conditioner is for the hair lengths and ends, not the scalp — on the scalp it can make hair look oily and flat.

4 **Skipping a patch test before hair colour or depilatory:** These contain strong chemicals; a small skin test first can prevent a severe reaction.

5 **Sharing combs and caps during a lice outbreak:** This spreads lice. Treat affected persons together and wash shared items in hot water.

6 **Expecting a cosmetic to "cure" hair fall:** Cosmetics groom and care for hair; sudden or severe hair loss needs a doctor's advice, not just a new shampoo.

17. Mnemonics

1 **Seven hair problems — "Did Harry Drink Orange Juice? Sally's Parrot Giggles Loudly": D**andruff, **H**air fall, **D**ry hair, **O**ily hair, **S**plit ends, **P**remature greying, **L**ice. (First letters: D-H-D-O-S-P-L.)

2 **Simpler — "3 D's + O + S + P + L": D**andruff, **D**ry hair, **D**... no — better: "**D**andruff, **H**air fall, **D**ry, **O**ily, **S**plit ends, **P**remature greying, **L**ice" — remember "**D**o **H**air **D**octors **O**ften **S**olve **P**roblems **L**ovingly."

3 **Product roles — "Clean, Soft, Shine, Smooth, Colour, Clear, Shave": Sh**ampoo cleans, **C**onditioner softens, **O**il gives shine, **S**erum smooths frizz, **C**olour changes colour, **D**epilatory clears unwanted hair, **S**having products aid shaving.

4 **Dandruff signs — "F-I": F**lakes + **I**tching.

5 **Lice check — "Nits Stick":** Nits **stick** firmly (unlike dandruff flakes that flick off).

18. Exam Summary

Common hair problems are dandruff (visible scalp flakes with itching), hair fall (excessive shedding with thinning), dry hair (rough and dull from lack of oil/moisture), oily hair (greasy and flat from excess sebum), split ends (forked hair tips from damage), premature greying (early loss of melanin pigment, mainly a family tendency), and lice (tiny scalp insects whose eggs, nits, stick firmly to hair). Each problem is recognised by its visible signs. Hair cosmetics clean, soften, colour, or remove hair: shampoo cleanses; conditioner softens and detangles; hair oil softens and gives shine; hair serum controls frizz and adds shine; hair colour changes hair colour; depilatories dissolve unwanted hair at the skin surface; and shaving products aid comfortable shaving. A hair cosmeceutical is a cosmetic that also contains an active ingredient aimed at a specific concern, such as an anti-dandruff shampoo. Herbal hair care products use plant ingredients for traditional hair-care concerns. Pharmacists match signs to problems and problems to product categories, counsel on safe use (patch tests, label directions), and refer severe cases to a doctor without making cure claims.

19. One-Minute Revision

- Hair = **keratin** from **follicles**; **sebum** = scalp's natural oil.
- 7 problems: **dandruff** (flakes+itch), **hair fall** (excess shedding), **dry hair** (rough/dull), **oily hair** (greasy/flat), **split ends** (forked tips), **premature greying** (early melanin loss), **lice** (insects; nits stick).
- Products: **shampoo** (cleanse) → **conditioner** (soften) → **oil/serum** (shine/frizz) → **colour** (change colour) → **depilatory/shaving** (remove hair).
- **Cosmeceutical** = cosmetic + active aimed at a concern (e.g., anti-dandruff shampoo).
- Nits **stick**, dandruff **flicks**. Conditioner on **lengths**, not scalp.

20. Short Questions

1 Define dandruff. Mention its common causes and signs.

2 What is the difference between normal hair shedding and hair fall?

3 Describe dry hair and oily hair with their signs.

4 What are split ends? How do they form?

5 What is premature greying? What is its main cause?

6 How can you tell lice nits apart from dandruff flakes?

7 Define hair cosmetic and hair cosmeceutical with one example each.

8 State the one-line role of: shampoo, conditioner, hair serum, depilatory.

9 What is sebum? How is it related to dry and oily hair?

10 What is the function of the hair cuticle?

21. Long Questions

1 Describe the common hair problems (dandruff, hair fall, dry hair, oily hair, split ends, premature greying, lice) — what each is, its causes, and its signs.

2 Write a note on hair cosmetics and cosmeceuticals: classify the main categories and state the role of each.

3 Explain how dandruff flakes form, how split ends develop, and how greying happens, with simple flowcharts.

22. MCQs (with Answer Key)

1 Visible white flakes falling from the scalp with itching indicate:

a) Split ends b) Dandruff c) Premature greying d) Oily hair

1 Hair is mainly made of the protein:

a) Collagen b) Keratin c) Elastin d) Albumin

1 The natural oil produced by scalp glands is called:

a) Sebum b) Serum c) Melanin d) Glycerin

1 Hair that looks greasy and flat soon after washing is a sign of:

a) Dry hair b) Oily hair c) Split ends d) Dandruff

1 The forked, frayed appearance of hair tips is called:

a) Frizz b) Split ends c) Nits d) Flyaways

1 Hair colour comes from the pigment:

a) Keratin b) Sebum c) Melanin d) Collagen

1 Lice eggs stuck to the hair are called:

a) Flakes b) Nits c) Spores d) Scales

1 Unlike dandruff flakes, nits:

a) Are white in colour b) Cause itching c) Stick firmly to hair and do not flick off easily d) Fall on the shoulders

1 An anti-dandruff shampoo is best described as a:

a) Pure cosmetic with no active ingredient b) Hair cosmeceutical c) Medicine for oral use d) Hair colour

1 The one-line role of a conditioner is to:

a) Clean the scalp b) Soften hair and make combing easy after shampooing c) Change hair colour d) Remove unwanted hair

1 A depilatory removes unwanted hair by:

a) Cutting it with a blade b) Dissolving it at the skin surface c) Pulling it from the root d) Burning it

1 Hair serum is mainly used for:

a) Washing dirt from the scalp b) Frizz control and shine c) Colouring grey hair d) Killing lice

Answer Key: 1-b, 2-b, 3-a, 4-b, 5-b, 6-c, 7-b, 8-c, 9-b, 10-b, 11-b, 12-b

23. Viva Questions

1 Name the seven common hair problems.

2 What is dandruff?

3 What protein is hair made of?

4 What is sebum?

5 How do you differentiate nits from dandruff flakes?

6 What are split ends?

7 What causes premature greying mainly?

8 What is a hair cosmeceutical? Give an example.

9 State the role of shampoo in one line.

10 State the role of conditioner in one line.

11 What does a depilatory do?

12 Name two herbal ingredients traditionally used in Indian hair care.

24. Application-Based Questions

1 A customer shows white flakes on her shoulders and says her scalp itches. Which hair problem is likely, and which product category would you suggest? Explain your reasoning.

2 A mother finds her school-going daughter scratching her head constantly. On checking, she sees tiny oval specks firmly stuck to hair near the scalp behind the ears. What is the likely problem? How is it different from dandruff, and what general advice would you give?

3 A young man complains his hair looks greasy and flat every evening though he washes it every morning. Identify the problem and suggest the right product category and washing guidance.

4 A customer wants to colour her grey hair at home for the first time. What safety advice would you give before she uses a hair colour product?

5 A customer with long hair has rough, forked hair tips and heavy tangling at the ends. Identify the problem, explain simply how it formed, and suggest suitable product categories plus one non-product measure.

25. References

- Baki & Alexander
- Barel/Paye/Maibach
- Benson & Watkinson
- Chisvert & Salvador
- Dweck & Santos
- Matsumoto
- Rosen

CHAPTER 7: Shampoos — Types, Formulation, Preparation, Packing and Evaluation

1. Learning Objectives

After studying this chapter, you will be able to:

- Define shampoo and explain its basic purpose in simple words.
- Name and describe the types of shampoos: clear/transparent, cream, dry shampoo, baby shampoo, anti-dandruff shampoo, and conditioning (2-in-1) shampoo.
- List the ingredient groups in a general shampoo composition and state the functional role of each (surfactants, foam boosters, conditioning agents, thickeners, pearling agents, preservatives, fragrance, pH adjusters).
- Read and interpret an illustrative (typical, not official) shampoo composition table.
- Describe the general method of preparation of a shampoo as a step-by-step flowchart.
- Describe how shampoos are packed and why the packing matters.
- List and explain the evaluation parameters of shampoos (foam test, viscosity, pH, solid content, surface tension, dirt dispersion) in generic terms.
- Answer short, long, MCQ, viva, and application-based exam questions on this topic.

2. Definitions

- **Shampoo:** A cosmetic cleansing product, usually a viscous (thick) liquid, used to wash dirt, excess oil (sebum), flakes, and styling-product residues from the hair and scalp, and then rinsed away with water.
- **Surfactant:** Short for "surface-active agent." A cleaning molecule with two ends — one end loves water, the other end loves oil/dirt. It surrounds oil and dirt so water can wash them away. Surfactants are the main cleaning agents in shampoo and also create foam.
- **Foam (lather):** The bubbles formed when shampoo is rubbed with water. Foam helps spread the shampoo through the hair, though foam amount alone does not decide cleaning power.
- **Foam booster:** An ingredient added to make the foam richer, creamier, and longer-lasting.
- **Conditioning agent:** An ingredient that coats the hair surface to make it soft, smooth, and easy to comb after washing.
- **Thickener (viscosity builder):** An ingredient that makes the shampoo thick enough to stay on the palm and spread easily instead of running away like water.
- **Pearling agent (opacifier):** An ingredient that gives the shampoo a pearly, shiny-white look instead of a plain transparent look.
- **Preservative:** An ingredient that stops bacteria and fungi from growing in the shampoo during storage, keeping it safe to use.
- **pH adjuster:** An ingredient used to bring the shampoo's pH to a skin-friendly slightly acidic range.
- **pH:** A scale from 0 to 14 that tells whether something is acidic (below 7), neutral (7), or alkaline (above 7). Shampoos are usually kept slightly acidic to suit the scalp.
- **Dry shampoo:** A powder or spray product that cleans hair without water by absorbing excess oil, used between regular washes.
- **2-in-1 shampoo (conditioning shampoo):** A shampoo that cleans and conditions in one step — it contains both surfactants and conditioning agents.
- **Anti-dandruff shampoo:** A shampoo containing an active ingredient aimed at controlling dandruff flakes — a hair cosmeceutical.
- **Baby shampoo:** A very mild shampoo made for babies, designed to be gentle on the eyes and delicate skin.
- **Solid content:** The percentage of the shampoo that remains after all the water is evaporated — it tells how much "real material" (cleaning and other ingredients) the shampoo contains.
- **Surface tension:** The tight "skin" on the surface of water that makes water bead up; surfactants lower it so water can spread and wet the hair properly.
- **Dirt dispersion:** The ability of the shampoo to keep removed dirt floating in the wash water so it rinses away instead of settling back on the hair.

3. Terminology Table

Term	Simple Meaning
Shampoo	Hair and scalp cleanser, rinsed off with water

Term	Simple Meaning
Surfactant	Main cleaning molecule; loves water at one end, oil at the other
Lather/foam	Bubbles that spread shampoo through hair
Foam booster	Makes foam richer and longer-lasting
Conditioning agent	Makes hair soft, smooth, easy to comb
Thickener	Makes shampoo thick, not watery
Pearling agent	Gives a pearly white look
Preservative	Stops germs growing in the bottle
pH adjuster	Sets the shampoo to a scalp-friendly pH
Dry shampoo	Waterless powder/spray that absorbs oil
2-in-1 shampoo	Shampoo + conditioner in one bottle
Anti-dandruff shampoo	Shampoo with an active aimed at dandruff flakes
Baby shampoo	Extra-mild shampoo for babies
Solid content	Non-water part of the shampoo
Surface tension	Water's surface "skin"; lowered by surfactants
Dirt dispersion	Keeping washed-off dirt suspended so it rinses away

4. Simple Explanations

4.1 What does a shampoo actually do?

A shampoo has one main job: **clean the hair and scalp**, then rinse away completely. During the day, hair collects:

- **Sebum** (the scalp's natural oil),
- **Dirt and dust** from the air,
- **Flakes** of dead skin,
- **Residues** of styling products or oils.

Water alone cannot remove oil (oil and water do not mix — like oil floating on dal). The **surfactant** is the hero: one end of the surfactant molecule grabs the oil/dirt, the other end grabs the water. When you rinse, the water pulls the surfactant — and the dirt comes along with it. That is the whole cleaning trick.

4.2 Why does shampoo make foam?

When you rub shampoo with water, surfactant molecules trap air and form bubbles — this is **foam or lather**. Foam is useful because it helps the shampoo **spread evenly** through all the hair so every strand gets cleaned. Important truth for exams: **more foam does not always mean more cleaning.** Foam amount depends on the surfactant type; cleaning depends on the whole formula. A low-foam shampoo can still clean well.

4.3 Why are conditioning agents added to some shampoos?

Washing removes oil — including some of the natural oil that keeps hair soft. So after shampooing, hair can feel rough and tangle. **Conditioning agents** fix this: they coat each hair with a thin smooth layer,

flatten the cuticle scales, and reduce friction. Result: soft, shiny, easy-to-comb hair. A **2-in-1 shampoo** simply puts the conditioner inside the shampoo bottle so one wash does both jobs.

4.4 Why must shampoo pH be controlled?

The scalp and hair are happiest at a **slightly acidic pH** (below 7). A shampoo that is strongly alkaline (high pH) can lift the cuticle scales too much, leaving hair rough and dull. So a **pH adjuster** (usually a mild acid) is used to bring the shampoo into the slightly acidic, scalp-friendly range. This is checked during evaluation with a pH meter.

4.5 Why do shampoos need preservatives?

A shampoo bottle contains water plus food-like ingredients (oils, proteins) — a perfect home for bacteria and fungi once opened and used with wet hands. **Preservatives** stop these germs from growing, so the shampoo stays safe through its shelf life. Without preservatives, a shampoo could become contaminated and cause scalp infections.

5. Classifications

5.1 Types of shampoos (by form and purpose)

1. **Clear/transparent shampoo:** A see-through liquid shampoo. The most common everyday type; gives a clean, light wash.
2. **Cream shampoo:** A thick, creamy, opaque shampoo. Feels richer; often contains more conditioning agents — suited to dry hair.
3. **Dry shampoo:** A powder or spray used **without water**. It absorbs excess oil from the hair so the hair looks fresh between washes. Useful while travelling or when washing is not possible.
4. **Baby shampoo:** An extra-mild, tear-free type shampoo made for babies' delicate skin and eyes. Uses the mildest surfactants and minimal fragrance.
5. **Anti-dandruff shampoo:** Contains an active ingredient aimed at controlling dandruff flakes (a cosmeceutical). Used as directed on the label, not always as a daily shampoo.
6. **Conditioning shampoo (2-in-1):** Cleans and conditions in one step; contains surfactants plus conditioning agents. Convenient for normal hair and for people who want a quick wash.

5.2 Shampoo ingredients (by functional role)

Functional group	Role in the shampoo
Surfactants (primary + secondary)	Main cleaning; make foam
Foam boosters	Richer, longer-lasting foam
Conditioning agents	Softness, smoothness, easy combing
Thickeners	Right thickness for handling
Pearling agents	Pearly attractive appearance
Preservatives	Stop microbial growth; safety
Fragrance	Pleasant smell
pH adjusters	Scalp-friendly slightly acidic pH

Functional group	Role in the shampoo
Water (purified)	The base/carrier in which everything is dissolved or mixed

6. Mechanisms and Processes

6.1 How a surfactant cleans (the key mechanism)

```
One surfactant molecule has TWO ends:
    Head → loves WATER (hydrophilic)
    Tail → loves OIL/DIRT (hydrophobic)

Step 1: Tails grab the oil and dirt on the hair
Step 2: Heads face outward toward the water
Step 3: Tiny balls (micelles) form — dirt trapped inside, water-loving heads outside
Step 4: Rinsing washes the micelles (with the dirt inside) away
Result: clean hair
```

6.2 How foam boosters and thickeners help

- **Foam boosters** join the surfactants at the bubble walls and make the bubbles smaller, creamier, and slower to pop — so the lather feels rich.
- **Thickeners** (often a salt or a polymer) make the liquid thick so a small amount stays on the palm, spreads controllably, and does not drip off before it can work.

6.3 How conditioning agents work in a 2-in-1 shampoo

This looks like a contradiction: shampoo cleans (removes), conditioner coats (adds). The trick is **timing**:

```
During washing (with lots of water):
    → Surfactants dominate; dirt and oil are lifted and rinsed away

During rinsing (water running off, product diluted):
    → Conditioning agents, which are attracted to hair, deposit as a thin film
    → Hair is left soft and smooth after the dirt is gone
```

So cleaning happens first, conditioning deposits last — both in one bottle.

6.4 How preservatives protect the shampoo

```
Opened bottle + wet hands + warm bathroom
    → Bacteria/fungi try to grow in the water-based shampoo
    → Preservative molecules stop their growth
    → Shampoo stays safe till its expiry date
```

7. Textual Diagrams and Flowcharts

7.1 General method of preparation of shampoo (steps flowchart)

```
STEP 1: Take purified water in a clean mixing vessel
            |
STEP 2: Add the PRIMARY SURFACTANT slowly with gentle stirring
        (avoid fast whipping — it makes unwanted foam in the vessel)
            |
STEP 3: Add the SECONDARY SURFACTANT and FOAM BOOSTER; stir till uniform
            |
STEP 4: Add the THICKENER; stir till the required thickness is reached
            |
STEP 5: Add CONDITIONING AGENTS and PEARLING AGENT (if the type needs them);
        mix gently till evenly distributed
            |
STEP 6: Add PRESERVATIVE and FRAGRANCE; mix well
            |
STEP 7: Check pH; add pH ADJUSTER little by little till slightly acidic range
            |
STEP 8: Make up the final volume/weight with purified water; mix till uniform
            |
STEP 9: Quality check (appearance, pH, viscosity) → PACK into clean containers
```

Key manufacturing cautions (general): use **purified water** (not tap water, which carries germs and minerals); stir **gently** to avoid trapping air and foam; add fragrance and preservative **after** the main mixing so heat (if any was used) does not spoil them; always **check pH** before packing.

7.2 Shampoo types at a glance

```
SHAMPOO TYPES
    ├── Clear/transparent → everyday see-through liquid wash
    ├── Cream             → thick creamy wash, extra conditioning feel
    ├── Dry shampoo       → waterless powder/spray; absorbs oil between washes
    ├── Baby shampoo      → extra mild, gentle on eyes
    ├── Anti-dandruff     → active aimed at flakes (cosmeceutical)
    └── Conditioning (2-in-1) → cleans + conditions in one step
```

7.3 From dirty hair to clean hair (process view)

```
Dirty hair (oil + dust + flakes)
        |  + Shampoo + water + rubbing
        ▼
Surfactants surround oil/dirt → foam spreads the mix → micelles trap dirt
        |  + Rinsing with water
        ▼
Clean hair (+ thin conditioning film, if conditioning agents present)
```

8. Infographic Concept Box

INFOGRAPHIC CONCEPT: "Inside a Shampoo Bottle" — a cutaway illustration of a shampoo bottle with labelled layers and callouts: surfactant molecules drawn as tadpoles (round water-loving heads, wavy oil-loving tails) grabbing dirt particles; a foam cloud labelled "foam booster makes bubbles creamy"; a silky ribbon wrapping a hair strand labelled "conditioning agent smooths"; a shield icon labelled "preservative guards against germs"; a pH strip icon labelled "pH adjuster keeps it scalp-friendly". Beside the bottle, six small icons show the six shampoo types. Caption: "Every ingredient has one job — together they clean, soften, and protect."

9. Tables

Table 9.1: ILLUSTRATIVE general composition of a shampoo (typical example — NOT an official or pharmacopoeial formula)

Note: The table below shows a **typical, illustrative** composition to teach the functional role of each ingredient group. It is **not** an official formula, not a pharmacopoeial standard, and not a manufacturing recipe. Real commercial formulas vary widely and are proprietary.

Ingredient group	Typical illustrative level (qualitative)	Functional role
Purified water	Largest part (base/carrier)	Dissolves and carries all ingredients
Primary surfactant	Moderate amount (main cleaner)	Main cleaning and foam formation
Secondary surfactant	Smaller amount	Boosts foam, makes formula milder
Foam booster	Small amount	Richer, longer-lasting foam
Conditioning agent	Small amount	Softness, smoothness, easy combing
Thickener	Small amount	Gives proper thickness for handling
Pearling agent	Very small amount (optional)	Pearly white attractive appearance
Preservative	Very small amount	Prevents bacterial/fungal growth
Fragrance	Very small amount	Pleasant smell
pH adjuster	As needed (small amount)	Sets slightly acidic, scalp-friendly pH
(Anti-dandruff active)	(Only in anti-dandruff type)	Aimed at controlling dandruff flakes

Table 9.2: Shampoo types — comparison

Type	Appearance/form	Key feature	Typical user need
Clear/transparent	See-through liquid	Light, everyday clean	Normal hair, daily washing
Cream	Thick, opaque cream	Richer, more conditioning feel	Dry or rough hair
Dry shampoo	Powder or spray, no water	Absorbs oil without washing	Travel, between washes
Baby shampoo	Mild liquid	Extra mild, gentle on eyes	Babies and very sensitive scalps
Anti-dandruff	Liquid (like clear/cream)	Contains active aimed at flakes	Dandruff concern (use as directed)
Conditioning (2-in-1)	Liquid	Cleans + conditions in one step	Quick wash, normal hair

Table 9.3: Evaluation parameters of shampoos (described generically — no numerical limits quoted)

Parameter	What is checked	How it is understood (generic)	Why it matters
Foam test (foaming ability and foam stability)	How much foam forms on shaking and how long it lasts	A fixed amount of shampoo solution is shaken in a cylinder; foam height is observed at once and after some minutes	Shows the shampoo spreads well and lathers as expected

Parameter	What is checked	How it is understood (generic)	Why it matters
Viscosity	Thickness of the shampoo	Measured with a viscometer; the shampoo should pour and spread controllably	Too thin = runs off the palm; too thick = hard to squeeze and spread
pH	Acidity/alkalinity	Measured with a pH meter; expected in the slightly acidic, scalp-friendly range	Protects the scalp and keeps cuticle smooth
Solid content	Non-water material in the shampoo	A weighed sample is evaporated to dryness; the remaining weight shows the solid matter	Indicates the shampoo is neither over-diluted nor overly concentrated
Surface tension	Ability to lower water's surface tension	Measured with a tensiometer on a diluted shampoo solution; a good shampoo lowers it well	Lower surface tension = better spreading and wetting of hair
Dirt dispersion	Whether removed dirt stays suspended or resettles	Ink/dirt is added to a shampoo solution and shaken; the foam and water are observed for how the dirt distributes	Good dispersion = dirt rinses away instead of settling back on hair
Appearance, colour, odour	Look, smell, feel	Checked by observation	First impression of quality; must be uniform and pleasant
Skin/eye irritation check (general)	Gentleness	Checked as per accepted safety practice (especially important for baby shampoo)	Ensures the product is safe for its intended users

10. Examples

1. **Surfactant example:** The primary surfactant is the main cleaner — without it, the shampoo would be just perfumed water that cannot remove oil.
2. **Foam booster example:** A shampoo that gives a rich creamy lather that does not collapse in one minute contains an effective foam booster.
3. **Conditioning agent example:** After using a 2-in-1 shampoo, hair combs smoothly without a separate conditioner — the conditioning agent did its job during rinsing.
4. **Thickener example:** A good shampoo sits as a blob on the palm; a shampoo as thin as water runs between the fingers — the thickener controls this.
5. **Pearling agent example:** The shiny pearl-like swirl seen in some white shampoos comes from the pearling agent; it changes only the look, not the cleaning.
6. **Dry shampoo example:** A traveller on a long train journey uses a dry shampoo spray at the roots; the powder absorbs oil and the hair looks fresh without water.
7. **Baby shampoo example:** A mother chooses a baby shampoo labelled mild and gentle on eyes for her infant — it uses milder surfactants than adult shampoos.
8. **Evaluation example:** In the foam test, the cylinder shows tall foam immediately after shaking and the foam is still standing after several minutes — good foam stability.

11. Analogies

1. **Surfactant = a two-handed helper.** One hand holds the oil/dirt, the other hand holds the water — and it introduces them so the water can carry the dirt away.
2. **Micelle = a prison van.** The dirt (prisoner) sits inside, surrounded by surfactant guards with water-loving heads facing out, and the whole van is driven away by the rinse water.
3. **Foam = a delivery vehicle.** Foam does not do the cleaning itself; like a delivery van, it carries the cleaner (surfactant) to every corner of the hair.
4. **Thickener = the right dal consistency.** Watery dal runs off the spoon; overly thick dal will not pour. Shampoo needs the same "just right" thickness to stay on the palm.
5. **Conditioner in 2-in-1 = a guest who arrives after the party.** The cleaners (surfactants) do their work and leave with the rinse; the conditioning agent arrives at the end and stays back to smooth the hair.
6. **Preservative = a security guard for the bottle.** It stands at the door and stops germs from entering and growing inside the shampoo.
7. **pH adjuster = tuning a musical instrument.** Just as a musician tunes a sitar to the right note, the pH adjuster tunes the shampoo to the scalp-friendly slightly acidic range.
8. **Dry shampoo = blotting paper for hair.** Just as blotting paper soaks extra ink without water, dry shampoo powder soaks extra oil without water.

12. Pharmacy Relevance

- Shampoos are core pharmacy-shelf cosmetics; pharmacists must know their types, ingredients, and evaluation to guide customers and check quality.
- **Matching product to need:** A pharmacist can match the customer's concern to the right type — flakes → anti-dandruff shampoo (used as directed); dry rough hair → cream or conditioning shampoo; baby → baby shampoo; travel → dry shampoo.
- **Reading the label:** Pharmacy training helps decode labels — spotting the surfactant base, checking for preservatives, and understanding "pH balanced" claims.
- **Quality awareness:** Pharmacists learn evaluation parameters (foam, viscosity, pH, solid content, surface tension, dirt dispersion) that are used in quality control of cosmetic products.
- **Safety counselling:** Advice like "keep shampoo away from eyes," "rinse thoroughly," "use anti-dandruff shampoo as directed on the label," and "do a patch test before a new product" comes naturally from pharmacy knowledge.
- **Manufacturing insight:** The general preparation steps (purified water, gentle mixing, pH checking before packing) teach good manufacturing habits applicable to many liquid cosmetics.

13. India Context

- India is one of the world's largest shampoo markets; sachets (small low-cost packets) made shampoos affordable and popular across rural and small-town India.
- **Herbal shampoos** based on shikakai, reetha, amla, and henna are widely used in India and connect traditional hair-washing practices with modern shampoo science.

- In India's dusty and humid climate, frequent washing is common, so **mild everyday shampoos** are in high demand.
- **Dry shampoos** are gaining popularity among young urban Indians for travel, hostel life, and busy schedules.
- Indian pharmacopoeial and standards bodies set quality expectations for cosmetics sold in India; pharmacy students learn evaluation parameters as the foundation for understanding such quality control.
- Coconut-oil-based hair care traditions mean many Indians use shampoo **after oiling** — the shampoo must be strong enough to remove the oil in one or two washes.

14. Key Points

- Shampoo = cleansing product that removes oil, dirt, flakes, and residues; rinsed off with water.
- Surfactants are the main cleaning agents (two-ended molecules: water-loving head, oil-loving tail); they also make foam.
- Foam helps spread the shampoo; foam amount alone does not decide cleaning power.
- Ingredient groups and roles: surfactants (clean), foam boosters (rich foam), conditioning agents (softness), thickeners (thickness), pearling agents (pearly look), preservatives (safety), fragrance (smell), pH adjusters (scalp-friendly pH), purified water (base).
- Types: clear/transparent, cream, dry shampoo (waterless), baby shampoo (extra mild), anti-dandruff (active aimed at flakes), conditioning 2-in-1 (clean + condition).
- Preparation: purified water → surfactants → foam booster → thickener → conditioning/pearling agents → preservative + fragrance → pH adjustment → make up volume → check → pack. Stir gently; use purified water.
- Packing: clean, dry, tightly closed containers (bottles, sachets, tubes) that protect from contamination, leakage, and light.
- Evaluation (generic, no limits quoted): foam test, viscosity, pH, solid content, surface tension, dirt dispersion, plus appearance/odour and gentleness checks.

15. Common Confusions

1 **More foam = better shampoo?** No. Foam helps spreading, but cleaning depends on the whole formula. A low-foam shampoo can clean well.

2 **2-in-1 vs. shampoo + separate conditioner:** A 2-in-1 is convenient for normal hair; very dry or damaged hair often needs a separate conditioner for deeper softening.

3 **Dry shampoo vs. regular shampoo:** Dry shampoo absorbs oil without water for freshness between washes — it does not replace regular washing with water.

4 **Anti-dandruff shampoo vs. daily shampoo:** Anti-dandruff shampoo is a cosmeceutical aimed at flakes and is used as directed on the label; it is not always meant for indefinite daily use like a plain shampoo.

5 **Pearling agent vs. cleaning power:** The pearly look is only appearance — it does not make the shampoo clean better.

6 **pH "balanced" meaning:** It means the pH is set near the scalp-friendly slightly acidic range — not that the pH is 7 (neutral).

16. Common Mistakes

1 **Using too much shampoo:** A coin-sized amount is enough for most hair; excess shampoo wastes product and needs extra rinsing.

2 **Not rinsing thoroughly:** Leftover shampoo on the scalp can cause itching and dullness. Rinse until the water runs clear and hair feels "squeaky."

3 **Washing with very hot water:** Hot water strips too much natural oil and can irritate the scalp; lukewarm water is kinder.

4 **Scrubbing with nails:** Scratching the scalp with nails causes tiny wounds; massage gently with fingertips.

5 **Applying shampoo directly to dry hair without wetting first:** Hair must be fully wet so the shampoo spreads and lathers evenly.

6 **Using anti-dandruff shampoo forever without review:** Use as directed; if flakes persist or the scalp becomes irritated, seek advice instead of continuing blindly.

7 **In manufacturing: stirring too fast.** Vigorous stirring whips air into the batch and creates foam in the vessel, making filling difficult — stir gently.

17. Mnemonics

1 **Ingredient roles — "Sally's Foam Can Turn Thick, Pearly, Preserved, Fragrant, pH-fine":** **S**urfactants (clean), **F**oam boosters, **C**onditioning agents, **T**hickeners, **P**earling agents, **P**reservatives, **F**ragrance, pH adjusters.

2 **Shampoo types — "Clear Cream, Dry Baby, Anti-Dandruff, Two-in-One":** **C**lear, **C**ream, **D**ry, **B**aby, **A**nti-dandruff, **2**-in-1 — remember "**C**lean **C**are **D**aily, **B**abies **A**lso **T**idy."

3 **Evaluation parameters — "Foam, Viscosity, pH, Solids, Surface tension, Dirt dispersion":** "**F**ive **V**ery **P**icky **S**cientists **S**tudy **D**irt" — **F**oam, **V**iscosity, **pH**, **S**olid content, **S**urface tension, **D**irt dispersion.

4 **Preparation order — "Water, Surfactant, Foam, Thick, Condition, Preserve, Perfume, pH, Pack":** add in this order — **W-S-F-T-C-P-P-pH-P**.

5 **Surfactant's two ends — "Head Hearts water, Tail Takes oil":** **H**ead = **H**ydrophilic (water-loving), **T**ail = oil-loving.

18. Exam Summary

A shampoo is a cleansing cosmetic that removes sebum, dirt, flakes, and residues from hair and scalp and is rinsed off with water. Surfactants are the main cleaning agents — two-ended molecules whose oil-loving tails grab dirt and water-loving heads face the water, forming micelles that rinse away. Foam helps spread

the shampoo but does not alone decide cleaning power. General composition includes surfactants, foam boosters, conditioning agents, thickeners, pearling agents, preservatives, fragrance, pH adjusters, and purified water as the base (all illustrative, not official formulas). Types include clear/transparent, cream, dry shampoo (waterless oil absorber), baby shampoo (extra mild), anti-dandruff shampoo (cosmeceutical with an active aimed at flakes), and conditioning 2-in-1 shampoo (cleans and conditions in one step). Preparation follows ordered steps: purified water, surfactants, foam booster, thickener, conditioning/pearling agents, preservative and fragrance, pH adjustment to the slightly acidic scalp-friendly range, making up volume, checking, and packing into clean, tightly closed containers. Evaluation parameters, described generically without numerical limits, are the foam test, viscosity, pH, solid content, surface tension, dirt dispersion, appearance/odour, and gentleness checks.

19. One-Minute Revision

- Shampoo **cleanses** hair/scalp; **surfactants** do the cleaning (two ends: head loves water, tail loves oil → micelles rinse dirt away).
- **Foam spreads** the shampoo; more foam ≠ more cleaning.
- Ingredients: **surfactants, foam boosters, conditioning agents, thickeners, pearling agents, preservatives, fragrance, pH adjusters**, purified water base (illustrative only).
- Types: **clear, cream, dry (waterless), baby (mild), anti-dandruff (active), 2-in-1 (clean+condition)**.
- Prep order: **water → surfactants → foam booster → thickener → condition/pearl → preservative+fragrance → pH adjust → make up → check → pack**. Gentle stirring, purified water.
- Evaluation: **foam, viscosity, pH, solid content, surface tension, dirt dispersion** (generic, no limits quoted).

20. Short Questions

1 Define shampoo. What is its main purpose?

2 What is a surfactant? Explain its two-ended structure in simple words.

3 Why does shampoo form foam? Does more foam always mean better cleaning?

4 Name the six types of shampoos and state one key feature of each.

5 State the functional role of: foam booster, thickener, pearling agent, preservative.

6 Why is pH adjustment important in shampoos?

7 What is a 2-in-1 shampoo? How can cleaning and conditioning happen in one bottle?

8 What is dry shampoo? When is it useful?

9 Why are preservatives added to shampoos?

10 What is meant by solid content and dirt dispersion in shampoo evaluation?

21. Long Questions

1 Classify shampoos into their types and describe each type with its features and uses.

2 Describe the general composition of a shampoo, giving the functional role of each ingredient group. (Use an illustrative table; note that it is not an official formula.)

3 Describe the general method of preparation of a shampoo with a step-by-step flowchart, including manufacturing cautions.

4 Describe the evaluation parameters of shampoos (foam test, viscosity, pH, solid content, surface tension, dirt dispersion) in generic terms.

22. MCQs (with Answer Key)

1 The main cleaning agents in a shampoo are:

a) Thickeners b) Surfactants c) Pearling agents d) Preservatives

1 A surfactant molecule has:

a) Two water-loving ends b) Two oil-loving ends c) One water-loving end and one oil-loving end d) No charged ends at all

1 During rinsing, dirt is carried away inside tiny surfactant balls called:

a) Bubbles b) Micelles c) Droplets d) Crystals

1 Foam in shampoo mainly helps to:

a) Kill germs b) Spread the shampoo evenly through the hair c) Change hair colour d) Thicken the shampoo

1 Which ingredient makes the foam richer and longer-lasting?

a) pH adjuster b) Foam booster c) Preservative d) Pearling agent

1 The ingredient that gives shampoo a pearly white look is the:

a) Thickener b) Pearling agent c) Foam booster d) Conditioning agent

1 Preservatives are added to shampoo to:

a) Improve foam b) Stop bacteria and fungi from growing in the product c) Add fragrance d) Adjust pH

1 A shampoo that cleans without water by absorbing oil is called:

a) Cream shampoo b) Dry shampoo c) Baby shampoo d) 2-in-1 shampoo

1 Baby shampoo is specially designed to be:

a) Strongly alkaline b) Extra mild and gentle on eyes c) Highly fragranced d) Free of water

1 An anti-dandruff shampoo is best classified as a:

a) Pure food product b) Hair cosmeceutical c) Hair colour d) Shaving product

1 In shampoo preparation, purified water is used instead of tap water mainly because:

a) It is cheaper b) It is free from germs and unwanted minerals c) It makes more foam d) It adds fragrance

1 Solid content of a shampoo tells:

a) How much foam it makes b) The non-water material present after evaporation c) Its pH value d) Its colour intensity

Answer Key: 1-b, 2-c, 3-b, 4-b, 5-b, 6-b, 7-b, 8-b, 9-b, 10-b, 11-b, 12-b

23. Viva Questions

1 What is a shampoo?

2 What is a surfactant?

3 Why does shampoo form foam?

4 Does more foam always mean better cleaning? Why?

5 Name the six shampoo types.

6 What is a 2-in-1 shampoo?

7 What is dry shampoo?

8 State the role of a thickener.

9 Why are preservatives needed in shampoo?

10 What pH range suits the scalp?

11 What is checked in the foam test?

12 What does dirt dispersion mean?

24. Application-Based Questions

1 A customer with dry, rough hair asks for a shampoo recommendation. Which type would you suggest — clear, cream, or dry shampoo? Justify your choice.

2 During shampoo manufacturing, the operator stirs the batch at very high speed and the vessel fills with foam, making filling difficult. What went wrong, and what is the correct practice?

3 A customer complains that her shampoo is "as thin as water and runs off her palm." Which ingredient group is likely missing or insufficient, and what is its role?

4 A hostel student wants something to freshen her hair during a 3-day trip without water access. Suggest a suitable product type and explain how it works.

5 In quality control, a shampoo sample shows good foam height immediately after shaking but the foam collapses within a minute. Which evaluation parameter is weak, and which ingredient group could improve it?

25. References

- Baki & Alexander

- Barel/Paye/Maibach
- Benson & Watkinson
- Chisvert & Salvador
- Dweck & Santos
- Matsumoto
- Rosen

CHAPTER 8: Hair Oils, Serums, Conditioners, Hair Colors, Depilatory and Shaving Products; Herbal Hair Care

1. Learning Objectives

After studying this chapter, the student will be able to:

- Explain what hair oils are and describe the traditional concept of oiling hair in India.
- Define hair serums and explain how they differ from hair oils.
- Describe conditioners, their types, and how they work in simple terms.
- Explain the three categories of hair colors: temporary, semi-permanent, and permanent.
- Describe chemical depilatory products and shaving products with safety cautions.
- List herbal ingredients traditionally used in hair care products.

2. Definitions

- **Hair oil:** A cosmetic product made mainly of vegetable oils (or mineral oil), sometimes with herbal extracts or added vitamins, applied to the scalp and hair to lubricate, protect, and soften hair.
- **Hair serum:** A light, often silicone-based liquid product applied mainly to the length and ends of hair to add shine, reduce frizz, and make hair look smooth.
- **Conditioner:** A cosmetic preparation applied after shampooing that improves hair feel, shine, and manageability by coating the hair shaft.
- **Hair color:** A cosmetic product used to change or deepen the color of hair.
- **Depilatory product:** A cosmetic preparation that removes unwanted hair at the skin surface by a chemical or physical action.
- **Shaving product:** A cream, foam, or gel applied to the skin before shaving to soften the hair and protect the skin during razor use.
- **Herbal hair care product:** A hair product that contains plant-derived ingredients (such as amla, shikakai, or reetha), traditionally used for hair cleansing and conditioning.

3. Terminology

Term	Meaning in simple words
Frizz	Rough, flyaway hair that looks puffy instead of smooth.
Manageability	How easy the hair is to comb, style, and control.
Cuticle	The outermost layer of a hair strand, like tiny overlapping roof tiles.
Cortex	The inner part of a hair strand where color and strength mainly sit.
Oxidative color	Permanent hair color that develops color by a chemical reaction inside the hair.
Temporary color	Hair color that sits on the surface and washes out with one shampoo.
Semi-permanent color	Hair color that partly penetrates the cuticle and lasts several washes.
Patch test	A small test of a product on a small skin area to check for irritation before full use.
After-shave	A product applied to the skin after shaving to soothe and refresh it.
Silicone	A smooth, slippery ingredient used in serums and conditioners to give shine and reduce friction.

4. Simple Explanation

Hair oils — the traditional concept. In India, applying oil to hair ("champi" or head massage) has been done for generations. The idea is simple: hair needs a protective coat because everyday things — dust, sun, combing, washing — dry it out and break it. An oil layer sits on the hair surface, makes it feel softer, reduces breakage during combing, and keeps the scalp comfortable. Oils are applied to the scalp and along the hair, often a little before washing.

General composition idea of hair oils. Hair oils are built around a base oil plus optional extras:

- **Base oil:** a vegetable oil such as coconut oil or almond oil, or mineral oil (light liquid paraffin).
- **Herbal extracts/perfume:** small amounts for fragrance and traditional appeal.
- **Optional additives:** vitamins (like vitamin E) or other conditioning ingredients.

Hair serums — what they are. A serum is a light, usually silicone-based liquid. Unlike an oil, it is not heavy or greasy; it forms a very thin slippery film on the hair surface. It is applied mostly to the mid-length and ends of the hair (not rubbed into the scalp like oil), to make hair look smooth, shiny, and to control frizz.

How serums differ from oils — simple rule: oil is a traditional heavier product applied to scalp and hair, often before washing; serum is a modern lighter product applied after washing, mainly on the hair length for shine and smoothness. Think of oil as "feeding and protecting the hair" and serum as "polishing the outside of the hair."

Conditioners — how they work simply. Shampooing cleans the hair but also lifts the cuticle tiles and removes natural oil, leaving hair rough. A conditioner does the opposite job: it lays down a thin slippery coating on the hair surface so the cuticle tiles lie flat again. Result: hair feels soft, combs easily, looks shiny, and tangles less.

Types of conditioners (simple):

- **Rinse-off conditioner:** applied after shampoo, left for 1–2 minutes, then rinsed out. Most common.
- **Leave-in conditioner:** applied to damp hair and not rinsed; light and used for daily manageability.
- **Deep conditioner / hair mask:** a richer cream used once a week or so, left on longer for extra softness.
- **Color-protecting conditioner:** made for colored hair; helps keep the color looking good (generic concept, no specific claims).

Hair colors — the three categories.

1 **Temporary color:** coats only the outside of the hair; washes out with the next shampoo. Simple concept: like chalk on a blackboard — easy on, easy off.

2 **Semi-permanent color:** color molecules partly go under the cuticle layer and stay through several washes (typically 6–8 washes), gradually fading. No chemical mixing needed before use.

3 **Permanent color:** a chemical reaction (oxidation) develops new color inside the hair cortex; it does not wash out and must grow out or be re-colored. Because it uses chemicals, a **patch test** before use is the standard safety step — a small amount is applied on a small skin area first to check for irritation.

Safety note for hair colors: coloring products are cosmetics, not medicines. They do not "treat" anything. Anyone using a permanent color should follow the pack directions and do a patch test. If irritation happens, stop using it.

Depilatory products — the chemical depilatory concept. Unwanted hair grows from follicles under the skin and sticks out above the skin surface. Chemical depilatories are creams or powders that, when applied to the hair above the skin, weaken and dissolve the hair structure at the surface so the hair can be wiped away. They do not pull hair from the root; the hair remains inside the follicle and grows back in a few days.

Caution with depilatories: they are strong products. They must be used exactly for the time written on the pack — leaving them on too long can irritate or burn the skin. A patch test on a small area is the usual safety step, and they should never be used on broken or irritated skin.

Shaving products.

- **Before shaving — shaving creams, foams, gels:** these are applied to wet skin before shaving. Their job is to soften the hair, make the skin slippery, and cushion it so the razor glides and cuts cleanly with fewer nicks. Foam comes out as ready lather from a pressurized pack; cream is squeezed from a tube and lathered; gel is transparent and often lets the user see where the razor goes.
- **After shaving — after-shave products:** applied after the razor is done. Their job is to soothe the skin, cool it, and reduce the burning or redness feeling that shaving can leave. They may be lotions or balms with mild fragrance.

Herbal hair care products. These are hair products made with plant ingredients that have been traditionally used in India for hair care:

- **Amla (Indian gooseberry):** traditionally used in hair oils and hair packs; valued traditionally for hair shine and conditioning.
- **Shikakai (soap pod):** traditionally used as a mild natural cleanser for hair.
- **Reetha (soapnut):** traditionally used in hair cleansing products for its natural lather.

These are described by their traditional use; they are not claimed here to cure or treat any disease.

5. Classifications

Hair cosmetics and cosmeceuticals (by purpose):

1 Cleansing products — shampoos (covered in an earlier chapter).

2 Conditioning and softening products — hair oils, serums, conditioners.

3 Color-changing products — hair colors (temporary, semi-permanent, permanent).

4 Hair removal products — depilatories, shaving creams/foams/gels.

5 Herbal hair care products — products built around plant ingredients.

Conditioners (by how they are used):

- Rinse-off | Leave-in | Deep conditioning mask

Hair colors (by how long they last):

- Temporary (one wash) → Semi-permanent (several washes) → Permanent (grows out)

Shaving products (by stage of use):

- Pre-shave (creams, foams, gels) | Post-shave (after-shave lotions, balms)

6. Mechanisms / Processes

How conditioner smooths the hair (simple steps):

1 Shampooing lifts the cuticle tiles → hair surface becomes rough → hair tangles.

2 Conditioner is applied → its coating ingredients spread over the hair surface.

3 The coating makes the surface slippery → cuticle tiles lie flat.

4 Hair combs easily, reflects light (looks shiny), and tangles less.

How permanent hair color works (simple concept):

1 The color mixture is applied to the hair.

2 Small color-developing chemicals enter the hair shaft through the cuticle.

3 A chemical reaction (oxidation) forms larger colored molecules inside the cortex.

4 The larger molecules are trapped inside → the color stays permanently and grows out only with new hair growth.

How a chemical depilatory removes hair (simple concept):

1 Cream is spread over the unwanted hair and left for the time on the pack.

2 The chemicals soften and weaken the hair's protein structure above the skin.

3 The weakened hair is wiped or washed away at the skin surface.

4 The root inside the follicle remains, so hair grows back within days.

Shaving process (steps):

1 Wet the skin and hair → softens the hair.

2 Apply shaving cream/foam/gel → slippery cushion layer.

3 Shave with the razor in short strokes → cuts hair at the surface.

4 Rinse → apply after-shave to soothe the skin.

7. Textual Diagrams / Flowcharts

Diagram: the hair strand (cuticle–cortex idea)

```
Outer surface:  CUTICLE — overlapping flat tiles (like roof shingles)
                    |
Inner core:     CORTEX — strength and natural color live here
```

Takeaway: conditioners and serums work on the cuticle (outside); permanent colors reach the cortex (inside).

Flowchart: oil vs serum — where each goes

```
HAIR OIL  --->  scalp + full hair length, BEFORE wash, massaged in
HAIR SERUM ---> mid-length + ends only, AFTER wash, thin film for shine
```

Takeaway: oil is a pre-wash protector; serum is a post-wash polisher.

Flowchart: the three hair colors

```
TEMPORARY ------> sits ON hair ------> gone in 1 wash
SEMI-PERMANENT -> partly under cuticle -> fades in several washes
PERMANENT ------> reacts inside cortex -> stays, grows out
```

Takeaway: the deeper the color goes, the longer it lasts.

Flowchart: safe depilatory use

```
1. Patch test small area  -->  2. Apply as per pack time ONLY
--> 3. Wipe/wash away --> 4. Rinse well --> 5. Stop if irritation
```

Takeaway: timing and the patch test are the two safety keys.

8. Infographic Concept Box

INFOGRAPHIC CONCEPT: A two-panel visual titled "Oil vs Serum — Know the Difference." Left panel (hair oil): an amber bottle with a dropper, arrows pointing to the scalp and full hair length, label "Before wash • Heavier • Traditional • Massaged in." Right panel (hair serum): a slim pump bottle, arrows pointing only to mid-length and ends, label "After wash • Lighter • Modern • Thin shine film." A middle banner reads "Same goal — protected, smooth hair; different stage, different feel." Simple icons, warm amber vs cool silver color scheme.

9. Tables

Table 1: Illustrative general composition of a hair oil (typical, not an official formula)

Ingredient type	Purpose
Base oil (e.g., coconut oil, almond oil, or mineral oil)	Main lubricating and protecting ingredient
Herbal extract / perfume	Fragrance and traditional appeal
Vitamin E (optional)	Antioxidant-style additive used in some oils

This table shows a typical/illustrative idea of composition, not an official or pharmacopoeial formula.

Table 2: Illustrative general composition of a conditioner (typical, not an official formula)

Ingredient type	Purpose
Conditioning agent	Coats hair, makes it soft and easy to comb
Thickener	Gives the cream body
Preservative	Keeps the product safe during use
Perfume	Pleasant smell
Water	Base medium

This table shows a typical/illustrative idea of composition, not an official or pharmacopoeial formula.

Table 3: Comparison of hair colors

Feature	Temporary	Semi-permanent	Permanent
Where the color sits	On the hair surface	Partly under the cuticle	Inside the cortex
How long it lasts	One wash	Several washes	Until hair grows out
Chemical mixing before use	No	No	Yes
Patch test importance	Low but good practice	Advised	Advised

Table 4: Evaluation parameters for hair care products (general idea)

Parameter	What is checked
Appearance and feel	Color, texture, smoothness of the product
pH	Skin-friendly range (generic check, no specific limit stated here)
Spreadability	How easily the product spreads on hair/skin
Stability	Product stays uniform on storage

Parameter	What is checked
Irritation/sensitivity check	No redness or burning on test skin
Performance	Hair feels soft, combs easily; color lasts as claimed

10. Examples

- Hair oil example: a coconut-oil-based hair oil massaged into the scalp before a bath.
- Serum example: a silicone-based serum applied to the ends of damp hair after shampooing to reduce frizz.
- Conditioner example: a rinse-off conditioner used after every shampoo for smooth combing.
- Hair color example: a temporary color spray for a function, washed out the next day.
- Depilatory example: a depilatory cream used on legs, wiped off after the time given on the pack.
- Shaving example: shaving foam lathered on the cheek before a razor shave, followed by an after-shave lotion.
- Herbal example: a hair oil containing amla and a shampoo base using shikakai and reetha — both traditionally used in Indian hair care.

11. Analogies

- **Conditioner on hair** is like **hair conditioner on a rough road**: the shampoo dug up the road (rough cuticle); the conditioner re-paves it smooth.
- **Temporary vs permanent hair color** is like **chalk vs paint on a wall**: chalk wipes off in one wipe; paint stays until the wall is repainted.
- **Serum vs oil** is like **a thin polish vs a thick blanket**: both protect the bed (hair), but the polish is light and the blanket is heavy.
- **Depilatory action** is like **cutting grass at ground level**: the top is gone, but the roots stay and the grass grows back.

12. Pharmacy Relevance

Pharmacists should know these products because customers ask about them every day: which conditioner suits dry hair, whether a hair color needs a patch test, how long a depilatory cream should stay on, and which after-shave suits sensitive skin. A pharmacist can explain safe use, warn against overuse, and guide customers toward suitable products without making medical claims. Understanding general composition ideas also helps in quality discussion and in explaining why products behave the way they do.

13. India Context

Hair oiling is a deep-rooted Indian tradition — coconut oil in the South and West, mustard oil in parts of the North, and amla-based oils across the country. Shikakai and reetha have been used as natural hair cleansers in Indian households for generations. The Indian market also has a large range of herbal hair oils and herbal shampoos, and pharmacists in India are frequently asked about traditional ingredients like

amla, shikakai, and reetha alongside modern products like serums and conditioners.

14. Key Points

- Hair oils protect and lubricate hair, applied traditionally to scalp and hair before washing.
- Hair serums are light, silicone-based, applied after washing on mid-length and ends for shine and frizz control.
- Conditioners coat the hair surface so the cuticle lies flat: rinse-off, leave-in, and deep (mask) types.
- Hair colors: temporary (one wash), semi-permanent (several washes), permanent (chemical reaction inside the hair; grows out).
- Permanent colors need a patch test and pack directions must be followed.
- Chemical depilatories dissolve hair at the skin surface; keep to the pack time and do a patch test.
- Shaving products: pre-shave creams/foams/gels soften and protect; after-shave soothes.
- Herbal hair care: amla, shikakai, reetha are traditionally used in Indian hair products.

15. Common Confusions

- **Serum vs oil:** they are not the same; serum is light and post-wash, oil is heavier and pre-wash.
- **Conditioner vs shampoo:** shampoo cleans (removes oil); conditioner coats (adds smoothness). They are a pair, not substitutes.
- **Semi-permanent vs permanent color:** semi-permanent fades in several washes; permanent does not wash out.
- **Depilatory vs shaving:** both remove surface hair; depilatory uses chemicals, shaving uses a razor — neither removes the root.
- **Herbal = automatically safe:** "herbal" describes the source, not a guarantee of zero irritation; patch tests still apply.

16. Common Mistakes

- Applying serum to the scalp like oil (it is meant for mid-length and ends).
- Skipping the patch test before a permanent hair color or depilatory.
- Leaving depilatory cream on longer than the pack time, hoping for a "better" result.
- Using conditioner on a very dirty scalp instead of shampooing first.
- Expecting herbal products to cure hair fall or baldness — they are cosmetics, not medicines.

17. Mnemonics

- **"O-B-S-C-D-S"** for hair product types: **O**il, **S**erum, **C**onditioner, **C**olor, **D**epilatory, **S**have — "Our Shiny Curls Come Daily Styled."

- **"T-S-P"** for hair colors: **T**emporary (1 wash), **S**emi (several), **P**ermanent (grows out) — "Today, Soon, Permanent."
- **"P-T"** for depilatory safety: **P**atch test, **T**ime on pack — "Protect Time."

18. Exam Summary

This chapter introduced the main hair care product groups beyond shampoo. Hair oils (traditional, pre-wash, scalp + hair) differ from hair serums (light, silicone-based, post-wash, ends only). Conditioners work by coating the hair surface so the cuticle lies flat; types are rinse-off, leave-in, and deep conditioning masks. Hair colors are temporary (surface, one wash), semi-permanent (partly under cuticle, several washes), and permanent (oxidative reaction inside the cortex, grows out) — patch tests are the key safety step. Chemical depilatories weaken hair at the skin surface so it wipes away; strict pack-time and patch tests are essential. Shaving products include pre-shave creams/foams/gels (soften, lubricate, cushion) and after-shave products (soothe, cool). Herbal hair care uses ingredients traditionally valued in India: amla, shikakai, and reetha.

19. One-Minute Revision

Oil = pre-wash, scalp + hair, traditional protector. Serum = post-wash, ends only, shine film. Conditioner = coats hair, cuticle lies flat; rinse-off / leave-in / mask. Colors: temporary (1 wash), semi-permanent (several), permanent (inside cortex, grows out) — patch test! Depilatory = chemical surface removal, mind the time. Shave: cream/foam/gel before, after-shave after. Herbal trio: amla, shikakai, reetha — traditionally used.

20. Short Questions

1 Define hair serum and state two differences between a serum and a hair oil.

2 Name the three types of conditioners based on how they are used.

3 Differentiate temporary, semi-permanent, and permanent hair colors.

4 Why is a patch test advised before using a permanent hair color?

5 Explain the chemical depilatory concept in two or three lines.

6 List the two stages of shaving products with one example each.

7 Name three herbal ingredients traditionally used in Indian hair care and their traditional uses.

21. Long Questions

1 Describe hair oils and hair serums. Compare them with respect to composition idea, method of use, and purpose.

2 Explain how conditioners work. Describe the types of conditioners with examples of use.

3 Classify hair colors and explain each type with its mechanism in simple terms. Add a note on safety.

4 Write a note on chemical depilatory products: concept, method of use, and precautions.

5 Describe shaving products: pre-shave and post-shave types with their purposes.

6 Write a short note on herbal hair care products with reference to amla, shikakai, and reetha.

22. MCQs

1 A hair serum is mainly applied to:

a) The scalp only b) Mid-length and ends of hair c) The roots before oiling d) Dry skin

1 The main job of a conditioner is to:

a) Clean the scalp deeply b) Coat the hair surface so it feels smooth c) Change hair color d) Remove dandruff permanently

1 A temporary hair color washes out after:

a) One shampoo b) Six months c) One year d) Never

1 Permanent hair color develops color mainly in the:

a) Cuticle b) Cortex c) Scalp d) Hair root bulb

1 Before using a permanent hair color, the advised safety step is:

a) Heating the product b) A patch test c) Mixing with oil d) Applying on wet face

1 Chemical depilatories remove hair:

a) From the root permanently b) At the skin surface c) By pulling with wax d) By freezing the follicle

1 Which of the following is a pre-shave product?

a) After-shave lotion b) Shaving foam c) Hair serum d) Nail enamel

1 After-shave products are mainly used to:

a) Color the beard b) Soothe and cool the skin after shaving c) Grow hair faster d) Clean the razor

1 Shikakai is traditionally used in hair care as a:

a) Hair color b) Mild natural cleanser c) Depilatory d) Preservative

1 Which pair lists two traditional Indian hair care herbs?

a) Amla and reetha b) Neem and tulsi c) Turmeric and sandalwood d) Rose and jasmine

1 A leave-in conditioner is:

a) Rinsed out after one minute b) Applied and not rinsed c) Used before shampoo d) Only for colored hair

1 Deep conditioning masks are used:

a) Every hour b) Occasionally for extra softness c) Instead of water d) On the scalp only

Answer key: 1-b, 2-b, 3-a, 4-b, 5-b, 6-b, 7-b, 8-b, 9-b, 10-a, 11-b, 12-b

23. Viva Questions

1 What is the difference between a hair oil and a hair serum?

2 Name the three categories of hair colors.

3 What does a patch test check?

4 How does a conditioner make hair easy to comb?

5 What is an after-shave product used for?

6 Name two traditional Indian herbs used in hair care.

24. Application-Based Questions

1 A customer complains that her hair looks frizzy even after oiling. She applies the oil after washing and styling. Explain what she may be doing wrong and suggest the correct stage for oil and serum use.

2 A young man wants to color his hair permanently for the first time and asks whether he can apply it directly. What safety advice would you give as a pharmacist?

3 A customer leaves a depilatory cream on for double the pack time to get "smoother" results and gets skin redness. Explain what went wrong and the correct practice.

25. References

- Baki & Alexander
- Barel/Paye/Maibach
- Benson & Watkinson
- Chisvert & Salvador
- Dweck & Santos
- Matsumoto
- Rosen