

Continue Learning with FirstHope

Complete Notes on the FirstHope App

Complete subject and semesters are available on FirstHope app only.

- Get complete subject and semester notes in the FirstHope app.
- Available for B.Pharm, D.Pharm, M.Pharm and Pharm.D students.

[Click here to get the FirstHope app](#)

Join the FirstHope Telegram Channel

Join FirstHope Notes and keep up with channel updates.

[Click here to join Telegram](#)

Instagram

@firsthope.official

[Click here to follow Instagram](#)

YouTube Channel

FirstHope-Pharmacy / Live streams

[Click here to watch the YouTube channel](#)

WhatsApp Channel

Follow FirstHope on WhatsApp.

[Click here to join the WhatsApp channel](#)

FirstHope Website

firsthopenotes.com

[Click here to visit the website](#)

Semester 6 - Practical Notes

Herbal Drug Technology

Complete Subject Manual

9 practicals and activities. Use the PDF bookmarks to move between practicals. Page numbers restart within each practical; the page counts below exclude the promotion pages.

Contents

No.	Practical / Activity	Pages
1	Study of Preliminary Phytochemical Screening	2
2	Study of Alcohol Content of Asava and Arista	2
3	Study of Evaluation of Natural-Origin Excipients	2
4	Study of Herbal-Extract Cosmetic Creams, Lotions and Shampoos	2
5	Study of Herbal-Extract Syrups, Mixtures and Tablets	2
6	Study of Monograph Analysis of an Herbal Drug	2
7	Study of Aldehyde Content in an Assigned Herbal Material	2
8	Study of Phenol Content in an Assigned Herbal Material	2
9	Study of Total Alkaloids in an Assigned Herbal Material	2

Study of Preliminary Phytochemical Screening

Practical 01 | Herbal Drug Technology

Aim

To study Preliminary Phytochemical Screening, and interpret the recorded observations.

Principle

- Preliminary reactions suggest chemical classes such as alkaloids, phenolics, glycosides or saponins. Matrix interference and reagent controls prevent a class reaction from being mistaken for a confirmed individual compound.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Prepared crude-drug extracts and completed or instructor-demonstrated class-test records.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Identify the measured property, units and controlled variables before setting up the apparatus.
2. Check the instrument, zero or calibration and record the relevant operating conditions.
3. Prepare a representative measured portion without changing its intended composition.
4. Obtain the readings specified for the property and repeat under the same conditions.
5. Calculate the required property, including corrections stated for the apparatus or method.
6. Summarize the replicate results and explain the effect of the variable studied.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Extract identity	_____
Chemical class	_____
Test and control	_____
Observed reaction	_____
Supported interpretation	_____

Calculations and Interpretation

- Record qualitative class findings with controls; no universal numerical concentration follows from a colour or precipitate.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Study of Alcohol Content of Asava and Arista

Practical 02 | Herbal Drug Technology

Aim

To study Alcohol Content of Asava and Arista, and interpret the recorded observations.

Principle

- The alcohol determination must distinguish the alcoholic fraction from dissolved sugars and other constituents. A method suitable for a purified/distilled fraction cannot be applied directly to an uncorrected sugary matrix.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Assigned finished products, instructor-prepared analytical fractions and method-specific density or instrumental calibration.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Identify the measured property, units and controlled variables before setting up the apparatus.
2. Check the instrument, zero or calibration and record the relevant operating conditions.
3. Prepare a representative measured portion without changing its intended composition.
4. Obtain the readings specified for the property and repeat under the same conditions.
5. Calculate the required property, including corrections stated for the apparatus or method.
6. Summarize the replicate results and explain the effect of the variable studied.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Product	_____
Method	_____
Temperature	_____
Calibration response	_____
Dilution	_____
Alcohol reporting basis	_____

Calculations and Interpretation

- Read the alcohol content from the applicable calibrated method.
- Report the stated volume/volume or mass basis and correct for the preparation steps.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Study of Evaluation of Natural-Origin Excipients

Practical 03 | Herbal Drug Technology

Aim

To study Evaluation of Natural-Origin Excipients, and interpret the recorded observations.

Principle

- Natural gums, mucilages and other excipients are evaluated for identity, moisture behaviour, viscosity, swelling and functional performance. Their natural origin does not alone establish consistency or suitability.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Assigned natural excipients and approved identity/functional test apparatus.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Identify the measured property, units and controlled variables before setting up the apparatus.
2. Check the instrument, zero or calibration and record the relevant operating conditions.
3. Prepare a representative measured portion without changing its intended composition.
4. Obtain the readings specified for the property and repeat under the same conditions.
5. Calculate the required property, including corrections stated for the apparatus or method.
6. Summarize the replicate results and explain the effect of the variable studied.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Excipient	_____
Identity observation	_____
Moisture result	_____
Swelling/viscosity	_____
Function comparison	_____

Calculations and Interpretation

- Report the property-specific equation, method and units.
- Compare function under the same concentration, temperature and measurement conditions.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Study of Herbal-Extract Cosmetic Creams, Lotions and Shampoos

Practical 04 | Herbal Drug Technology

Aim

To study Herbal-Extract Cosmetic Creams, Lotions and Shampoos, and interpret the recorded observations.

Principle

- A standardized prepared extract must remain compatible with the cosmetic vehicle. Creams/lotions emphasize emulsion and consistency properties; shampoos also emphasize surfactant performance and foam behaviour.
- A dosage form combines an active ingredient with excipients selected for processing, stability and performance.
- Preparation and evaluation are linked: changes in composition or process can alter the product quality attributes.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Approved extract and laboratory formulae, mixing equipment and evaluation apparatus.
- Assigned active ingredient, excipients and the instructor-approved master formula.
- Balance, mixing/preparation equipment, packaging materials and the assigned evaluation apparatus.

Method

1. Read the master formula and identify the purpose of each ingredient.
2. Calculate the quantities for the assigned laboratory batch and check ingredient identity.
3. Follow the specified order of addition and preparation process, recording actual quantities and process observations.
4. Measure the yield or finished quantity and package the laboratory preparation as specified.
5. Evaluate the product attributes listed for this dosage form with documented methods.
6. Compare the observations with the assigned specification and explain any difference.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Formulation type	_____
Extract basis	_____
Ingredient roles	_____
pH/consistency	_____
Separation or foam	_____
Stability observations	_____

Calculations and Interpretation

- Batch scale factor = required quantity/master quantity.
- Extract-marker concentration follows the standardized extract strength and actual amount incorporated.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Record changes in process or composition; do not conceal a deviation.
- Use the specification assigned to the exact product and dosage form.
- A teaching batch is for laboratory evaluation and is not released for patient use.

Viva Questions

1. Why identify excipient functions?

Each excipient can influence processing, stability, release or acceptability.

2. Why is appearance alone insufficient for evaluation?

It does not establish content, performance, stability or microbiological quality.

Study of Herbal-Extract Syrups, Mixtures and Tablets

Practical 05 | Herbal Drug Technology

Aim

To study Herbal-Extract Syrups, Mixtures and Tablets, and interpret the recorded observations.

Principle

- The extract strength and vehicle/dosage form determine the declared content and performance tests. A homogeneous liquid differs from a redispersible mixture or a compressed tablet.
- A dosage form combines an active ingredient with excipients selected for processing, stability and performance.
- Preparation and evaluation are linked: changes in composition or process can alter the product quality attributes.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Prepared standardized extract, approved oral laboratory formulae and assigned evaluation equipment.
- Assigned active ingredient, excipients and the instructor-approved master formula.
- Balance, mixing/preparation equipment, packaging materials and the assigned evaluation apparatus.

Method

1. Read the master formula and identify the purpose of each ingredient.
2. Calculate the quantities for the assigned laboratory batch and check ingredient identity.
3. Follow the specified order of addition and preparation process, recording actual quantities and process observations.
4. Measure the yield or finished quantity and package the laboratory preparation as specified.
5. Evaluate the product attributes listed for this dosage form with documented methods.
6. Compare the observations with the assigned specification and explain any difference.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Dosage form	_____
Extract marker basis	_____
Batch record	_____
Uniformity	_____
Assay	_____
Release or redispersion	_____

Calculations and Interpretation

- Declared marker amount = extract amount incorporated × verified marker fraction.
- Correct the measured result for preparation and dilution before comparing with the declared basis.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Record changes in process or composition; do not conceal a deviation.
- Use the specification assigned to the exact product and dosage form.
- A teaching batch is for laboratory evaluation and is not released for patient use.

Viva Questions

1. Why identify excipient functions?

Each excipient can influence processing, stability, release or acceptability.

2. Why is appearance alone insufficient for evaluation?

It does not establish content, performance, stability or microbiological quality.

Study of Monograph Analysis of an Herbal Drug

Practical 06 | Herbal Drug Technology

Aim

To study Monograph Analysis of an Herbal Drug, and interpret the recorded observations.

Principle

- A monograph specifies identity, quality tests and applicable limits for a defined drug material. The plant part, processing state and edition are integral to the comparison.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Authenticated herbal material, assigned current monograph and completed or observed test records.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Identify the measured property, units and controlled variables before setting up the apparatus.
2. Check the instrument, zero or calibration and record the relevant operating conditions.
3. Prepare a representative measured portion without changing its intended composition.
4. Obtain the readings specified for the property and repeat under the same conditions.
5. Calculate the required property, including corrections stated for the apparatus or method.
6. Summarize the replicate results and explain the effect of the variable studied.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Drug/plant part	_____
Monograph edition	_____
Identity test	_____
Quality measure	_____
Assigned criterion	_____
Conclusion	_____

Calculations and Interpretation

- Use each monograph-specified calculation and reporting basis.
- Compare only the tests completed for the defined material.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Study of Aldehyde Content in an Assigned Herbal Material

Practical 07 | Herbal Drug Technology

Aim

To study Aldehyde Content in an Assigned Herbal Material, and interpret the recorded observations.

Principle

- An assigned aldehyde assay measures a defined reactive fraction or analyte. The reaction stoichiometry and reporting basis must be verified for the method and material.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Prepared teaching analytical portion, assigned assay system and blank/reference records.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Identify the measured property, units and controlled variables before setting up the apparatus.
2. Check the instrument, zero or calibration and record the relevant operating conditions.
3. Prepare a representative measured portion without changing its intended composition.
4. Obtain the readings specified for the property and repeat under the same conditions.
5. Calculate the required property, including corrections stated for the apparatus or method.
6. Summarize the replicate results and explain the effect of the variable studied.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Material	_____
Assay reaction	_____
Blank/test response	_____
Factor/calibration	_____
Aldehyde result	_____

Calculations and Interpretation

- For a validated titrimetric assay: analyte amount = corrected volume × exact method factor.
- For an instrumental assay, use the reference calibration and documented dilution.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Study of Phenol Content in an Assigned Herbal Material

Practical 08 | Herbal Drug Technology

Aim

To study Phenol Content in an Assigned Herbal Material, and interpret the recorded observations.

Principle

- A phenol-related assay can report a defined analyte or a total response in reference-standard equivalents. An equivalents result is not automatically the mass of every phenolic constituent.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Prepared teaching extract, assigned phenol assay reagents/reference and completed readings.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Identify the measured property, units and controlled variables before setting up the apparatus.
2. Check the instrument, zero or calibration and record the relevant operating conditions.
3. Prepare a representative measured portion without changing its intended composition.
4. Obtain the readings specified for the property and repeat under the same conditions.
5. Calculate the required property, including corrections stated for the apparatus or method.
6. Summarize the replicate results and explain the effect of the variable studied.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Material	_____
Reference identity	_____
Blank/test response	_____
Calibration	_____
Reporting equivalents	_____

Calculations and Interpretation

- Obtain concentration from the valid standard-response relationship.
- State whether the result is a specific analyte quantity or reference-equivalent total response.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Study of Total Alkaloids in an Assigned Herbal Material

Practical 09 | Herbal Drug Technology

Aim

To study Total Alkaloids in an Assigned Herbal Material, and interpret the recorded observations.

Principle

- The total-alkaloid result is method-defined and may be reported as a reference alkaloid or dry fraction basis. A recovered fraction can include impurities unless the assigned assay establishes its content.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.
- Record the material identity, extract/ingredient strength and the method used so the result remains traceable.
- Use the assigned product or material specification; general chemical-class findings alone do not establish clinical effectiveness.

Materials and Apparatus

- Instructor-prepared teaching analytical fractions, method-specific standard and completed assay records.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Identify the measured property, units and controlled variables before setting up the apparatus.
2. Check the instrument, zero or calibration and record the relevant operating conditions.
3. Prepare a representative measured portion without changing its intended composition.
4. Obtain the readings specified for the property and repeat under the same conditions.
5. Calculate the required property, including corrections stated for the apparatus or method.
6. Summarize the replicate results and explain the effect of the variable studied.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Material	_____
Prepared fraction	_____
Method basis	_____
Blank/test response	_____
Reference factor	_____
Total-alkaloid result	_____

Calculations and Interpretation

- Calculate using the exact method/reference convention supplied.
- Report the defined alkaloid-equivalent or fraction basis; do not label an unverified fraction as pure active compound.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Continue Learning with FirstHope

Complete Notes on the FirstHope App

Complete subject and semesters are available on FirstHope app only.

- Get complete subject and semester notes in the FirstHope app.
- Available for B.Pharm, D.Pharm, M.Pharm and Pharm.D students.

[Click here to get the FirstHope app](#)

Join the FirstHope Telegram Channel

Join FirstHope Notes and keep up with channel updates.

[Click here to join Telegram](#)

Instagram

@firsthope.official

[Click here to follow Instagram](#)

YouTube Channel

FirstHope-Pharmacy / Live streams

[Click here to watch the YouTube channel](#)

WhatsApp Channel

Follow FirstHope on WhatsApp.

[Click here to join the WhatsApp channel](#)

FirstHope Website

firsthopenotes.com

[Click here to visit the website](#)