

B.Pharm Practical Notes

Semester 05

FirstHope

46 practical topics and guides, arranged by subject.

Industrial Pharmacy I

11 topics

Pharmacology II

15 topics

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How to Use These Notes

- Read the aim and principle before the practical.
- Record the actual findings or the provided simulation data.
- Use the calculations with the correct units and stated model.
- Review the precautions and viva questions after completing the record.

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Preformulation Studies of an Assigned Drug

Practical 01 | Industrial Pharmacy I

Aim

To study Preformulation Studies of an Assigned Drug, and interpret the recorded observations.

Principle

- Preformulation links the properties of the drug substance to dosage-form choices. Paracetamol, aspirin or another assigned drug can be compared for solubility, particle properties, moisture behaviour and compatibility.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.
- Aspirin can hydrolyse in the presence of moisture; any increase in apparent dissolution must not be mistaken for unchanged-drug stability.
- Poor powder flow can affect filling, while slow dissolution may require a separate formulation strategy.

Materials and Apparatus

- Assigned drug, balance, pH meter, microscopy or particle-size apparatus, solubility assay and prepared compatibility 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 drug form and the dosage form being considered.
2. Measure the assigned physical properties under stated conditions.
3. Study solubility in the specified media and record pH and temperature.
4. Review the assigned thermal, spectral or other compatibility comparisons with excipients.
5. Tabulate property results and link each to a processing, stability or release concern.
6. Propose a dosage-form approach supported by the observations.

Observation Record

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

Observation / parameter	Record / finding
Drug identity	_____
Solubility and pH	_____
Particle characteristics	_____
Moisture result	_____
Compatibility observations	_____

Calculations and Interpretation

- Report each measured property with its method and units.
- For an assay-based solubility result, correct the measured concentration for all dilution 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. What is the purpose of preformulation?

To understand drug properties before selecting the formulation and manufacturing approach.

2. Why control the test conditions?

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

3. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Preparation and Evaluation of Paracetamol Tablets

Practical 02 | Industrial Pharmacy I

Aim

To study Preparation and Evaluation of Paracetamol Tablets, and interpret the recorded observations.

Principle

- A tablet formulation balances flow, compressibility, disintegration and drug release. Paracetamol content must be assessed separately from tablet mass.
- 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.
- Identify the function of the diluent, binder, disintegrant and lubricant.
- Prepare and evaluate granules or the assigned direct-compression blend.
- Observe compression settings and record tablet defects or dimensional changes.
- Evaluate mass, mechanical strength, disintegration, assay and release with the assigned methods.

Materials and Apparatus

- Paracetamol, assigned diluent, binder, disintegrant and lubricant; granulation/compression equipment and tablet test 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
Formula and batch size	_____
Granule properties	_____
Mean tablet mass	_____
Strength/friability	_____
Disintegration/dissolution	_____
Assay	_____

Calculations and Interpretation

- Batch scale factor = desired quantity/master-formula quantity.
- Scale each ingredient by the same factor unless the approved formula specifies otherwise.
- Assay (%) = measured active amount/declared active amount × 100, on the same unit and product 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.

Preparation and Evaluation of Aspirin Tablets

Practical 03 | Industrial Pharmacy I

Aim

To study Preparation and Evaluation of Aspirin Tablets, and interpret the recorded observations.

Principle

- Aspirin tablet processing must consider moisture-associated hydrolysis as well as compressibility and release. A tablet can retain its mass while its chemical quality changes.
- 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 moisture and temperature exposure of the assigned process.
- Prepare the approved blend or granulation and observe compression.
- Evaluate tablet properties and distinguish physical defects from chemical deterioration.
- Interpret aspirin assay using the assigned analytical method and analyte basis.

Materials and Apparatus

- Aspirin and the approved tablet excipients, compression equipment and the assigned assay/quality tests.
- 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
Batch formula	_____
Process moisture exposure	_____
Tablet mass	_____
Mechanical tests	_____
Disintegration/release	_____
Assay	_____

Calculations and Interpretation

- Batch scale factor = desired quantity/master-formula quantity.
- Scale each ingredient by the same factor unless the approved formula specifies otherwise.
- Assay (%) = measured active amount/declared active amount × 100, on the same unit and product 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.

Preparation and Evaluation of Film Coating of Tablets or Granules

Practical 04 | Industrial Pharmacy I

Aim

To study Preparation and Evaluation of Film Coating of Tablets or Granules, and interpret the recorded observations.

Principle

- Film coating deposits a polymer-based layer. Polymer, plasticizer and process conditions influence film continuity, adhesion and the effect on release.
- 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.
- Identify the role of the polymer, plasticizer and vehicle.
- Review the coating-feed and drying balance demonstrated by the instructor.
- Observe coating distribution, sticking, picking or roughness during the assigned run.
- Measure dry mass gain and assess the film and relevant release behaviour.

Materials and Apparatus

- Assigned cores, film former, plasticizer and coating vehicle; supervised coating 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
Core mass	_____
Coating composition	_____
Process observations	_____
Dry coated mass	_____
Film appearance	_____
Release effect	_____

Calculations and Interpretation

- Dry coating gain (%) = $(\text{coated dry mass} - \text{initial core mass}) / \text{initial core mass} \times 100$.

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.

Preparation and Evaluation of Tetracycline Capsules

Practical 05 | Industrial Pharmacy I

Aim

To study Preparation and Evaluation of Tetracycline Capsules, and interpret the recorded observations.

Principle

- Capsule filling depends on a uniform, suitable-flowing powder blend. Capsule-shell properties and tetracycline stability must be considered separately from fill mass.
- 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.
- Identify the exact tetracycline form and the approved blend composition.
- Calculate the assigned fill quantity and observe uniform blending and filling.
- Record shell closure and appearance together with individual fill masses.
- Evaluate the finished capsules by the specified mass/content, disintegration and release tests.

Materials and Apparatus

- Assigned tetracycline form and excipients, capsule shells, filling demonstration and quality-test 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
Drug form	_____
Blend uniformity	_____
Shell size	_____
Fill mass	_____
Disintegration	_____
Assay and release	_____

Calculations and Interpretation

- Batch scale factor = desired quantity/master-formula quantity.
- Scale each ingredient by the same factor unless the approved formula specifies otherwise.
- Assay (%) = measured active amount/declared active amount × 100, on the same unit and product 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.

Preparation and Evaluation of Calcium Gluconate Injection

Practical 06 | Industrial Pharmacy I

Aim

To study Preparation and Evaluation of Calcium Gluconate Injection, and interpret the recorded observations.

Principle

- An injectable solution must satisfy chemical quality, particle control, sterility and container-closure requirements. Clear appearance alone does not establish suitability.
- 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.
- Review the drug and excipient roles in the approved injectable formula.
- Observe the trained demonstration of solution preparation and its process records.
- Distinguish a filtration step from a validated sterilization or aseptic process.
- Review assay, clarity/particles, pH and applicable sterility/endotoxin and closure records.

Materials and Apparatus

- Instructor-prepared calcium gluconate injection demonstration, approved formula and completed sterile-process/quality records.
- 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
Formula basis	_____
Solution clarity	_____
pH	_____
Particulate observation	_____
Assay	_____
Sterile-process and closure records	_____

Calculations and Interpretation

- Batch scale factor = desired quantity/master-formula quantity.
- Scale each ingredient by the same factor unless the approved formula specifies otherwise.
- Assay (%) = measured active amount/declared active amount × 100, on the same unit and product 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.

Preparation and Evaluation of Ascorbic Acid Injection

Practical 07 | Industrial Pharmacy I

Aim

To study Preparation and Evaluation of Ascorbic Acid Injection, and interpret the recorded observations.

Principle

- Ascorbic acid is susceptible to oxidation. The formulation and packaging are studied for control of oxygen, light, pH and chemical stability alongside injectable-product requirements.
- 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.
- Identify the approved stability-control approach and the role of each ingredient.
- Observe the instructor demonstration and record relevant exposure/packaging conditions.
- Review the assigned stability-indicating assay and distinguish colour change from quantitative potency.
- Interpret the chemical, particulate and sterile-quality records for the exact demonstration product.

Materials and Apparatus

- Prepared ascorbic acid injection demonstration, approved formula and completed chemical/sterile-quality records.
- 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
Drug and excipient roles	_____
Oxidation-related observations	_____
pH	_____
Assay	_____
Particles	_____
Packaging and process records	_____

Calculations and Interpretation

- Batch scale factor = desired quantity/master-formula quantity.
- Scale each ingredient by the same factor unless the approved formula specifies otherwise.
- Assay (%) = measured active amount/declared active amount × 100, on the same unit and product 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.

Preparation and Evaluation of Eye Drops and Eye Ointments

Practical 08 | Industrial Pharmacy I

Aim

To study Preparation and Evaluation of Eye Drops and Eye Ointments, and interpret the recorded observations.

Principle

- Ophthalmic solutions and ointments have different vehicles and release behaviour. Both require appropriate sterile processing, container integrity and ocular-product quality controls.
- 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.
- Compare the roles of aqueous vehicles in drops and semisolid bases in ointments.
- Observe the approved preparation demonstrations and record the process controls.
- Review clarity and pH for drops, and uniformity and particle/grittiness observations for ointments.
- Examine assay, container integrity and the applicable completed sterile-quality records.

Materials and Apparatus

- Prepared ophthalmic teaching products, approved formulae and completed sterility, particle and product-quality records.
- 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	_____
Vehicle and ingredient roles	_____
pH or consistency	_____
Particles/grittiness	_____
Drug content	_____
Closure/sterile-process records	_____

Calculations and Interpretation

- Batch scale factor = desired quantity/master-formula quantity.
- Scale each ingredient by the same factor unless the approved formula specifies otherwise.
- Assay (%) = measured active amount/declared active amount × 100, on the same unit and product 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.

Preparation and Evaluation of Cold Cream and Vanishing Cream

Practical 09 | Industrial Pharmacy I

Aim

To study Preparation and Evaluation of Cold Cream and Vanishing Cream, and interpret the recorded observations.

Principle

- Cold cream commonly illustrates a water-in-oil emulsion, while vanishing cream commonly illustrates an oil-in-water system. The assigned composition and an identification test determine the actual emulsion type.
- 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.
- Identify the oil, aqueous, emulsifying and consistency-building ingredients.
- Observe preparation of the phases and their combination in the approved order.
- Record cooling/mixing observations and appearance after preparation.
- Compare emulsion type, spreadability, consistency and stability with the assigned tests.

Materials and Apparatus

- Approved cream formulae, mixing apparatus and 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
Ingredient roles	_____
Emulsion type	_____
Appearance	_____
pH where applicable	_____
Spreadability	_____
Separation/stability observations	_____

Calculations and Interpretation

- Batch scale factor = desired quantity/master-formula quantity.
- Scale each ingredient by the same factor unless the approved formula specifies otherwise.
- Assay (%) = measured active amount/declared active amount × 100, on the same unit and product 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.

Quality Control of Marketed Tablets and Capsules

Practical 10 | Industrial Pharmacy I

Aim

To study Quality Control of Marketed Tablets and Capsules, and interpret the recorded observations.

Principle

- Pharmacopoeial quality control applies the relevant general chapter and product monograph to the exact dosage form. Mass uniformity, content uniformity, assay, disintegration and dissolution answer different questions.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.

Materials and Apparatus

- Marketed tablet/capsule records and the assigned applicable pharmacopoeial methods and 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. Record product identity, strength, dosage form and the pharmacopoeial edition used.
2. Identify the tests and limits applicable to that product rather than copying a universal limit.
3. Perform or review the assigned measurements and retain individual unit readings.
4. Calculate mass variation, assay or release on the correct product basis.
5. Compare each result with its own acceptance criterion and required stage rules.
6. Report compliance only for the tests actually completed.

Observation Record

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

Observation / parameter	Record / finding
Product and dosage form	_____
Test name	_____
Individual readings	_____
Calculated value	_____
Applicable limit	_____
Interpretation	_____

Calculations and Interpretation

- Mass deviation (%) = (individual mass - mean mass)/mean mass × 100.
- Drug released (%) = corrected cumulative drug amount/declared dose × 100.
- Apply the assigned content-uniformity calculation separately; mass variation does not automatically establish content uniformity.

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. Is disintegration the same as dissolution?

No. Disintegration is physical breakup; dissolution measures drug entering the specified medium.

2. Why control the test conditions?

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

3. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Pharmacopoeial Evaluation of Glass Containers

Practical 11 | Industrial Pharmacy I

Aim

To study Pharmacopoeial Evaluation of Glass Containers, and interpret the recorded observations.

Principle

- Glass-container suitability includes resistance to aqueous chemical attack and the characteristics required for its intended product. Surface and crushed-glass tests are distinct assessments.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.

Materials and Apparatus

- Assigned glass containers, instructor-demonstrated pharmacopoeial tests and completed extraction/titration 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 container and the intended pharmaceutical use.
2. Read the assigned method and distinguish the surface test from the glass-grains test.
3. Review the instructor-prepared test and reagent-blank records.
4. Calculate the endpoint or corrected titration result on the specified basis.
5. Compare with the exact method/category limit supplied for the exercise.
6. Report only the tested property and state the container category used.

Observation Record

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

Observation / parameter	Record / finding
Container type and use	_____
Test method	_____
Blank reading	_____
Test reading	_____
Applicable criterion	_____
Conclusion	_____

Calculations and Interpretation

- Corrected titration result = test result minus applicable blank result, on the stated method basis.
- Use the category-specific criterion; there is no single limit suitable for every glass test.

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 distinguish surface and glass-grains tests?

They assess different aspects of the container surface and glass material and have method-specific criteria.

2. Why control the test conditions?

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

3. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

Study of In-Vitro Pharmacology and Physiological Salt Solutions

Practical 01 | Pharmacology II

Aim

To study In-Vitro Pharmacology and Physiological Salt Solutions, and interpret the recorded observations.

Principle

- Physiological salt solutions support the ionic, osmotic and buffering environment of an isolated-preparation model. Model-specific compositions must not be interchanged.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Solution identity	_____
Ion/buffer roles	_____
Model conditions	_____
Baseline trace	_____

Calculations and Interpretation

- Identify major ion roles and the reason for pH, temperature and oxygenation control in the teaching simulation.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Drug Effects on an Isolated Frog Heart

Practical 02 | Pharmacology II

Aim

To study Drug Effects on an Isolated Frog Heart, and interpret the recorded observations.

Principle

- Autonomic and other interventions can change simulated rate and contractile force. Rate and force are separate endpoints and may change in different directions.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Treatment	_____
Baseline rate	_____
Post-treatment rate	_____
Force amplitude	_____
Trace pattern	_____

Calculations and Interpretation

- Rate change (%) = (test rate - baseline rate)/baseline rate × 100.
- Report contractile-amplitude changes separately from rate.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Drug Effects on Blood Pressure and Heart Rate

Practical 03 | Pharmacology II

Aim

To study Drug Effects on Blood Pressure and Heart Rate, and interpret the recorded observations.

Principle

- The simulated dog cardiovascular trace relates arterial pressure and rate to drug mechanisms and reflex responses. Direct receptor actions and reflex changes must be distinguished.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Intervention	_____
Baseline pressure	_____
Peak pressure	_____
Baseline/test heart rate	_____
Time course	_____

Calculations and Interpretation

- Pressure change = test pressure - baseline pressure.
- For a percentage change, divide by baseline pressure and multiply by 100.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Diuretic Activity in a Rodent Model

Practical 04 | Pharmacology II

Aim

To study Diuretic Activity in a Rodent Model, and interpret the recorded observations.

Principle

- Diuretic comparisons use urine output over the same collection interval and, where supplied, electrolyte excretion. Concentration alone does not measure total electrolyte loss.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Group	_____
Collection interval	_____
Urine volume	_____
Electrolyte concentration	_____
Electrolyte amount	_____

Calculations and Interpretation

- Electrolyte amount = urine electrolyte concentration × urine volume, with consistent units.
- Compare test and control output over equal intervals.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Acetylcholine Dose-Response Curve on Frog Rectus

Practical 05 | Pharmacology II

Aim

To study Acetylcholine Dose-Response Curve on Frog Rectus, and interpret the recorded observations.

Principle

- Increasing acetylcholine levels can produce a graded contractile response in the supplied skeletal-muscle model. Plotting response against log concentration supports comparison of sensitivity.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Acetylcholine concentration	_____
Log concentration	_____
Response amplitude	_____
Percent maximum	_____

Calculations and Interpretation

- Percent maximum = response amplitude/maximum response × 100.
- Read EC50 only when the data bracket 50% of the estimated maximum.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Physostigmine and Atropine Effects on Acetylcholine Responses

Practical 06 | Pharmacology II

Aim

To study Physostigmine and Atropine Effects on Acetylcholine Responses, and interpret the recorded observations.

Principle

- Physostigmine reduces acetylcholine breakdown; atropine blocks muscarinic receptors. The effect depends on whether the simulated preparation predominantly represents muscarinic or nicotinic responses.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Preparation	_____
Intervention	_____
Control curve	_____
Altered curve	_____
Maximum and EC50	_____

Calculations and Interpretation

- Compare EC50 and maximum response before and after intervention.
- Do not assume atropine competitively blocks the nicotinic receptor response of frog rectus.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Histamine Bioassay by Matching on Guinea Pig Ileum

Practical 07 | Pharmacology II

Aim

To study Histamine Bioassay by Matching on Guinea Pig Ileum, and interpret the recorded observations.

Principle

- A matching assay compares the unknown preparation with reference concentrations producing equivalent responses under the same simulated conditions.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Reference level	_____
Reference response	_____
Test dilution	_____
Matched response	_____
Potency estimate	_____

Calculations and Interpretation

- At a matched response, estimate test concentration using the matched reference concentration and documented test dilution.
- Matching is conditional on comparable response behaviour and valid controls.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Oxytocin Bioassay by Interpolation on Rat Uterine Horn

Practical 08 | Pharmacology II

Aim

To study Oxytocin Bioassay by Interpolation on Rat Uterine Horn, and interpret the recorded observations.

Principle

- Interpolation locates an unknown response between bracketing reference responses within an appropriate locally calibrated range. Tissue sensitivity is a model variable.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Reference concentration	_____
Reference response	_____
Unknown response	_____
Dilution	_____
Interpolated concentration	_____

Calculations and Interpretation

- Use the fitted reference calibration and the stated concentration or log-concentration axis.
- Avoid extrapolating beyond the bracketing reference responses.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Serotonin Bioassay by the Three-Point Method

Practical 09 | Pharmacology II

Aim

To study Serotonin Bioassay by the Three-Point Method, and interpret the recorded observations.

Principle

- A three-point bioassay uses two reference levels and one test level in a stated design. Relative potency is estimated within the common response range and the model assumptions.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Reference levels	_____
Test level	_____
Response replicates	_____
Model slope	_____
Relative potency	_____

Calculations and Interpretation

- Use the course-specified assay model and dilution correction.
- For a valid common log-dose slope, an appropriately defined horizontal log-dose shift gives a potency ratio of 10 raised to that shift.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Acetylcholine Bioassay by the Four-Point Method

Practical 10 | Pharmacology II

Aim

To study Acetylcholine Bioassay by the Four-Point Method, and interpret the recorded observations.

Principle

- Two reference and two test levels allow a parallel-line assay assessment in the suitable response range. Nonparallel responses invalidate a simple relative-potency interpretation.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Reference/test levels	_____
Replicate responses	_____
Slopes	_____
Parallelism assessment	_____
Potency	_____

Calculations and Interpretation

- Estimate the relative potency by the assigned parallel-line calculation or validated software.
- Keep the reference/test dilution factors and the direction of the log-dose shift explicit.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of pA₂ of Prazosin by Schild Plot

Practical 11 | Pharmacology II

Aim

To study pA₂ of Prazosin by Schild Plot, and interpret the recorded observations.

Principle

- A competitive antagonist can shift agonist concentration-response curves to the right without reducing the achievable maximum. A Schild analysis examines dose ratios at different antagonist levels.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Antagonist molar concentration	_____
Control EC50	_____
Blocked EC50	_____
Dose ratio	_____
Schild coordinates	_____

Calculations and Interpretation

- $DR = EC_{50} \text{ with antagonist} / EC_{50} \text{ without antagonist}$.
- Plot $\log_{10}(DR - 1)$ against $\log_{10}(\text{antagonist molar concentration})$.
- For a compatible equilibrium competitive model with slope near one: $pA_2 = -\log_{10}(KB)$.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of pD₂ from a Guinea Pig Ileum Response Curve

Practical 12 | Pharmacology II

Aim

To study pD₂ from a Guinea Pig Ileum Response Curve, and interpret the recorded observations.

Principle

- pD₂ expresses agonist potency as the negative base-10 logarithm of EC₅₀ in molar units. It is not the maximum response or clinical dose.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Molar concentration	_____
Response	_____
Maximum estimate	_____
EC50	_____
pD2	_____

Calculations and Interpretation

- $pD2 = -\log_{10}(EC50 \text{ in mol/L})$.
- State the agonist, preparation and response definition.

Worked Illustration

Illustration: $EC50 = 1.0 \times 10^{-6} \text{ mol/L}$ gives $pD2 = 6.0$.

The values in this illustration are for calculation practice.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Spasmogens and Spasmolytics on Rabbit Jejunum

Practical 13 | Pharmacology II

Aim

To study Spasmogens and Spasmolytics on Rabbit Jejunum, and interpret the recorded observations.

Principle

- Spasmogens can increase simulated smooth-muscle activity; spasmolytics can reduce selected induced responses. Baseline rhythmic activity and induced contraction must be distinguished.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Treatment	_____
Baseline activity	_____
Induced contraction	_____
Post-intervention amplitude	_____
Recovery	_____

Calculations and Interpretation

- For a defined induced response: inhibition (%) = $(\text{control induced response} - \text{test induced response}) / \text{control induced response} \times 100$.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Anti-Inflammatory Activity in a Paw-Edema Model

Practical 14 | Pharmacology II

Aim

To study Anti-Inflammatory Activity in a Paw-Edema Model, and interpret the recorded observations.

Principle

- Inflammatory swelling is compared using the increase from baseline at the same stated time. Comparing final volumes alone can confound an initial size difference.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Group	_____
Baseline volume	_____
Post-challenge volume	_____
Increase	_____
Inhibition	_____

Calculations and Interpretation

- Increase = post-challenge volume - baseline volume.
- Inhibition (%) = (control increase - test increase)/control increase × 100.

Worked Illustration

Illustration: control increase 0.60 mL and test increase 0.30 mL give 50.0% inhibition.

The values in this illustration are for calculation practice.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Study of Central and Peripheral Analgesic Activity

Practical 15 | Pharmacology II

Aim

To study Central and Peripheral Analgesic Activity, and interpret the recorded observations.

Principle

- Central teaching models may compare response latency, while peripheral models may compare a defined response count. The endpoint and interpretation depend on the simulated method.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

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

Observation / parameter	Record / finding
Model	_____
Control endpoint	_____
Test endpoint	_____
Observation interval	_____
Effect estimate	_____

Calculations and Interpretation

- For a count-reduction endpoint: inhibition (%) = (control count - test count)/control count × 100.
- For latency, report the defined latency change and the model's cut-off rather than using the count formula.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

Morphology, Histology and Phytochemical Study of Cinchona

Practical 01 | Pharmacognosy and Phytochemistry II

Aim

To study Morphology, Histology and Phytochemical Study of Cinchona, and interpret the recorded observations.

Principle

- Bark with characteristic fissuring/quill form and prepared sections showing cork, fibres and other bark elements; the principal teaching chemical group is quinoline alkaloids.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- Extraction study: compare the plant part, target constituent class and solvent-selection rationale in the prepared demonstration.
- Detection study: record the method, comparison/control and observed result. A class reaction alone does not prove the identity of every constituent.

Materials and Apparatus

- Authenticated cinchona specimen, prepared sections/powder mounts and instructor-prepared extract or completed detection records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Bark form	_____
Cork and fibres	_____
Powder features	_____
Alkaloid-class observation	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Morphology, Histology and Phytochemical Study of Cinnamon

Practical 02 | Pharmacognosy and Phytochemistry II

Aim

To study Morphology, Histology and Phytochemical Study of Cinnamon, and interpret the recorded observations.

Principle

- Bark studied for quill structure, cork/cortical characters and powder elements; volatile-oil constituents include cinnamaldehyde. The assigned species determines the comparison characters.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- Extraction study: compare the plant part, target constituent class and solvent-selection rationale in the prepared demonstration.
- Detection study: record the method, comparison/control and observed result. A class reaction alone does not prove the identity of every constituent.

Materials and Apparatus

- Authenticated cinnamon specimen, prepared sections/powder mounts and instructor-prepared extract or completed detection records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Quill and surface	_____
Section characters	_____
Powder fibres/cells	_____
Oil/aldehyde evidence	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Morphology, Histology and Phytochemical Study of Senna

Practical 03 | Pharmacognosy and Phytochemistry II

Aim

To study Morphology, Histology and Phytochemical Study of Senna, and interpret the recorded observations.

Principle

- Leaflets are studied for shape, epidermal/stomatal features and crystal-bearing tissues. Sennosides are anthraquinone-related glycosides and require a suitable assigned detection method.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- Extraction study: compare the plant part, target constituent class and solvent-selection rationale in the prepared demonstration.
- Detection study: record the method, comparison/control and observed result. A class reaction alone does not prove the identity of every constituent.

Materials and Apparatus

- Authenticated senna specimen, prepared sections/powder mounts and instructor-prepared extract or completed detection records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Leaflet shape	_____
Epidermis/stomata	_____
Calcium oxalate features	_____
Glycoside detection	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Morphology, Histology and Phytochemical Study of Clove

Practical 04 | Pharmacognosy and Phytochemistry II

Aim

To study Morphology, Histology and Phytochemical Study of Clove, and interpret the recorded observations.

Principle

- Dried flower buds are studied for the unopened head, stalk and prepared oil-gland tissue. Eugenol is a characteristic major constituent of clove volatile oil.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- Extraction study: compare the plant part, target constituent class and solvent-selection rationale in the prepared demonstration.
- Detection study: record the method, comparison/control and observed result. A class reaction alone does not prove the identity of every constituent.

Materials and Apparatus

- Authenticated clove specimen, prepared sections/powder mounts and instructor-prepared extract or completed detection records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Bud shape	_____
Oil-gland tissue	_____
Powder fragments	_____
Phenolic-oil evidence	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Morphology, Histology and Phytochemical Study of Ephedra

Practical 05 | Pharmacognosy and Phytochemistry II

Aim

To study Morphology, Histology and Phytochemical Study of Ephedra, and interpret the recorded observations.

Principle

- Jointed stems are compared with authenticated teaching material for nodes, reduced leaves and prepared tissue features. Ephedrine-family alkaloids are a characteristic chemical group.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- Extraction study: compare the plant part, target constituent class and solvent-selection rationale in the prepared demonstration.
- Detection study: record the method, comparison/control and observed result. A class reaction alone does not prove the identity of every constituent.

Materials and Apparatus

- Authenticated ephedra specimen, prepared sections/powder mounts and instructor-prepared extract or completed detection records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Jointed stem/nodes	_____
Reduced leaves	_____
Prepared section	_____
Alkaloid evidence	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Morphology, Histology and Phytochemical Study of Fennel

Practical 06 | Pharmacognosy and Phytochemistry II

Aim

To study Morphology, Histology and Phytochemical Study of Fennel, and interpret the recorded observations.

Principle

- Fruits are studied for paired mericarps, ridges and oil ducts or vittae in prepared sections. Anethole is a characteristic constituent in many fennel-oil teaching materials.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- Extraction study: compare the plant part, target constituent class and solvent-selection rationale in the prepared demonstration.
- Detection study: record the method, comparison/control and observed result. A class reaction alone does not prove the identity of every constituent.

Materials and Apparatus

- Authenticated fennel specimen, prepared sections/powder mounts and instructor-prepared extract or completed detection records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Fruit shape/ridges	_____
Mericaip section	_____
Vittae	_____
Volatile-oil evidence	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Morphology, Histology and Phytochemical Study of Coriander

Practical 07 | Pharmacognosy and Phytochemistry II

Aim

To study Morphology, Histology and Phytochemical Study of Coriander, and interpret the recorded observations.

Principle

- Fruits are studied for their globular appearance, mericarps and prepared pericarp/oil-duct characters. Linalool is a characteristic major volatile-oil constituent.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- Extraction study: compare the plant part, target constituent class and solvent-selection rationale in the prepared demonstration.
- Detection study: record the method, comparison/control and observed result. A class reaction alone does not prove the identity of every constituent.

Materials and Apparatus

- Authenticated coriander specimen, prepared sections/powder mounts and instructor-prepared extract or completed detection records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Fruit form	_____
Pericarp features	_____
Prepared powder	_____
Volatile-oil evidence	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Isolation and Detection Study of Caffeine from Tea Dust

Practical 08 | Pharmacognosy and Phytochemistry II

Aim

To study Isolation and Detection Study of Caffeine from Tea Dust, and interpret the recorded observations.

Principle

- Caffeine is a methylxanthine alkaloid. Isolation study separates it from the complex tea matrix and confirms identity with suitable comparison evidence.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.

Materials and Apparatus

- Tea teaching extract, instructor-prepared isolated fraction and comparison identity data.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Identify the plant part and target chemical class in the provided teaching material.
2. Review the completed demonstration and explain the purpose of its separation stages.
3. Compare the labelled fractions with the target-class detection or standard data supplied.
4. Record the identity/purity evidence separately from a general class-test observation.
5. Calculate recovery only if a verified dry mass and defined starting-material basis are supplied.
6. Explain the separation rationale and the limitations of the identity evidence.

Observation Record

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

Observation / parameter	Record / finding
Starting material	_____
Prepared fraction labels	_____
Separation rationale	_____
Comparison identity evidence	_____
Recovery data	_____

Calculations and Interpretation

- Recovery (%) = recovered dry fraction mass/defined starting-material mass × 100, when valid masses are supplied.
- Call this fraction recovery unless purity and active-constituent content have been established.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Isolation and Detection Study of Diosgenin from Dioscorea

Practical 09 | Pharmacognosy and Phytochemistry II

Aim

To study Isolation and Detection Study of Diosgenin from Dioscorea, and interpret the recorded observations.

Principle

- Diosgenin is a steroidal sapogenin; the distinction between a glycoside-containing plant fraction and the liberated aglycone is central to the study.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.

Materials and Apparatus

- Prepared Dioscorea fractions, instructor demonstration and comparison analytical data.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Identify the plant part and target chemical class in the provided teaching material.
2. Review the completed demonstration and explain the purpose of its separation stages.
3. Compare the labelled fractions with the target-class detection or standard data supplied.
4. Record the identity/purity evidence separately from a general class-test observation.
5. Calculate recovery only if a verified dry mass and defined starting-material basis are supplied.
6. Explain the separation rationale and the limitations of the identity evidence.

Observation Record

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

Observation / parameter	Record / finding
Starting material	_____
Prepared fraction labels	_____
Separation rationale	_____
Comparison identity evidence	_____
Recovery data	_____

Calculations and Interpretation

- Recovery (%) = recovered dry fraction mass/defined starting-material mass × 100, when valid masses are supplied.
- Call this fraction recovery unless purity and active-constituent content have been established.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Isolation and Detection Study of Atropine from Belladonna

Practical 10 | Pharmacognosy and Phytochemistry II

Aim

To study Isolation and Detection Study of Atropine from Belladonna, and interpret the recorded observations.

Principle

- Atropine is a tropane alkaloid. Study the instructor-prepared fractions and identity data; recovery of an alkaloid-positive fraction does not establish pure atropine.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.

Materials and Apparatus

- Prepared belladonna teaching fractions and completed separation/identity observations.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Identify the plant part and target chemical class in the provided teaching material.
2. Review the completed demonstration and explain the purpose of its separation stages.
3. Compare the labelled fractions with the target-class detection or standard data supplied.
4. Record the identity/purity evidence separately from a general class-test observation.
5. Calculate recovery only if a verified dry mass and defined starting-material basis are supplied.
6. Explain the separation rationale and the limitations of the identity evidence.

Observation Record

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

Observation / parameter	Record / finding
Starting material	_____
Prepared fraction labels	_____
Separation rationale	_____
Comparison identity evidence	_____
Recovery data	_____

Calculations and Interpretation

- Recovery (%) = recovered dry fraction mass/defined starting-material mass × 100, when valid masses are supplied.
- Call this fraction recovery unless purity and active-constituent content have been established.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Isolation and Detection Study of Sennosides from Senna

Practical 11 | Pharmacognosy and Phytochemistry II

Aim

To study Isolation and Detection Study of Sennosides from Senna, and interpret the recorded observations.

Principle

- Sennosides are glycosidic constituents studied by comparison with appropriate chromatographic or other analytical standards. A colour-class test cannot alone measure pure sennoside content.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.

Materials and Apparatus

- Prepared senna teaching fractions and completed comparison chromatograms.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Identify the plant part and target chemical class in the provided teaching material.
2. Review the completed demonstration and explain the purpose of its separation stages.
3. Compare the labelled fractions with the target-class detection or standard data supplied.
4. Record the identity/purity evidence separately from a general class-test observation.
5. Calculate recovery only if a verified dry mass and defined starting-material basis are supplied.
6. Explain the separation rationale and the limitations of the identity evidence.

Observation Record

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

Observation / parameter	Record / finding
Starting material	_____
Prepared fraction labels	_____
Separation rationale	_____
Comparison identity evidence	_____
Recovery data	_____

Calculations and Interpretation

- Recovery (%) = recovered dry fraction mass/defined starting-material mass × 100, when valid masses are supplied.
- Call this fraction recovery unless purity and active-constituent content have been established.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Separation of Sugars by Paper Chromatography

Practical 12 | Pharmacognosy and Phytochemistry II

Aim

To study Separation of Sugars by Paper Chromatography, and interpret the recorded observations.

Principle

- Paper chromatography separates assigned sugar standards and mixtures by their distribution in the chosen paper/mobile-phase system.
- Compounds separate because they interact differently with the stationary and mobile phases.
- Identity assessment uses an appropriate comparison standard and method conditions; one migration or retention value alone is not conclusive.

Materials and Apparatus

- Prepared sugar standards and mixtures, chromatography paper and the assigned detection system.
- Assigned test extract or mixture, comparison standards and the specified stationary/mobile phase system.
- Appropriate chromatographic apparatus, application equipment, developing chamber or instrument and the assigned detector.

Method

1. Record the stationary phase, mobile phase and the purpose of the separation.
2. Prepare test and comparison solutions at suitable concentrations for the assigned method.
3. Introduce measured test and comparison portions without overloading the separation system.
4. Develop or run the separation under the assigned conditions, recording the relevant operating details.
5. Locate separated bands, spots or peaks using the specified observation method.
6. Compare the test pattern with the standard and calculate the appropriate separation metric.

Observation Record

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

Observation / parameter	Record / finding
Sugar standard	_____
Spot distance	_____
Solvent-front distance	_____
Rf	_____
Mixture comparison	_____

Calculations and Interpretation

- For planar chromatography: $R_f = \text{distance travelled by spot centre} / \text{distance travelled by solvent front}$.
- R_f is dimensionless and normally lies between zero and one under a valid development.

Worked Illustration

Illustration: a spot travelling 3.0 cm with a solvent front travelling 6.0 cm has $R_f = 0.50$.

The values in this illustration are for calculation practice.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Keep application concentrated and avoid overloading.
- Record the solvent front immediately for planar chromatography.
- Use retention or migration data only with the stated system and relevant identity evidence.

Viva Questions

1. Why does overloading impair separation?

It broadens bands or spots and can change apparent migration or retention.

2. Why run a comparison standard?

It supplies a relevant reference pattern under the same analytical conditions.

Thin-Layer Chromatography of Herbal Extract

Practical 13 | Pharmacognosy and Phytochemistry II

Aim

To study Thin-Layer Chromatography of Herbal Extract, and interpret the recorded observations.

Principle

- A herbal TLC fingerprint compares the pattern of several constituents in a standardized system. Matching one spot does not establish the entire extract composition.
- Compounds separate because they interact differently with the stationary and mobile phases.
- Identity assessment uses an appropriate comparison standard and method conditions; one migration or retention value alone is not conclusive.

Materials and Apparatus

- Prepared herbal extract, standards, assigned TLC plate and development/detection system.
- Assigned test extract or mixture, comparison standards and the specified stationary/mobile phase system.
- Appropriate chromatographic apparatus, application equipment, developing chamber or instrument and the assigned detector.

Method

1. Record the stationary phase, mobile phase and the purpose of the separation.
2. Prepare test and comparison solutions at suitable concentrations for the assigned method.
3. Introduce measured test and comparison portions without overloading the separation system.
4. Develop or run the separation under the assigned conditions, recording the relevant operating details.
5. Locate separated bands, spots or peaks using the specified observation method.
6. Compare the test pattern with the standard and calculate the appropriate separation metric.

Observation Record

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

Observation / parameter	Record / finding
Extract identity	_____
Spot colour/appearance	_____
Migration distance	_____
Rf	_____
Comparison pattern	_____

Calculations and Interpretation

- For planar chromatography: $R_f = \text{distance travelled by spot centre} / \text{distance travelled by solvent front}$.
- R_f is dimensionless and normally lies between zero and one under a valid development.

Worked Illustration

Illustration: a spot travelling 3.0 cm with a solvent front travelling 6.0 cm has $R_f = 0.50$.

The values in this illustration are for calculation practice.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Keep application concentrated and avoid overloading.
- Record the solvent front immediately for planar chromatography.
- Use retention or migration data only with the stated system and relevant identity evidence.

Viva Questions

1. Why does overloading impair separation?

It broadens bands or spots and can change apparent migration or retention.

2. Why run a comparison standard?

It supplies a relevant reference pattern under the same analytical conditions.

Volatile-Oil Distillation and TLC Study

Practical 14 | Pharmacognosy and Phytochemistry II

Aim

To study Volatile-Oil Distillation and TLC Study, and interpret the recorded observations.

Principle

- Distillation co-collects suitable volatile constituents with water, while TLC compares the recovered oil fingerprint with the assigned standard. Distillation recovery and chromatographic identity are separate outcomes.
- Compounds separate because they interact differently with the stationary and mobile phases.
- Identity assessment uses an appropriate comparison standard and method conditions; one migration or retention value alone is not conclusive.
- Trace the demonstration path from vapour formation through condensation and phase separation.
- Discuss losses from incomplete separation, retention in apparatus or altered material composition without assuming that all volatile compounds are recovered equally.

Materials and Apparatus

- Instructor-demonstrated volatile-oil apparatus, prepared oil and TLC standards/records.
- Assigned test extract or mixture, comparison standards and the specified stationary/mobile phase system.
- Appropriate chromatographic apparatus, application equipment, developing chamber or instrument and the assigned detector.

Method

1. Record the stationary phase, mobile phase and the purpose of the separation.
2. Prepare test and comparison solutions at suitable concentrations for the assigned method.
3. Introduce measured test and comparison portions without overloading the separation system.
4. Develop or run the separation under the assigned conditions, recording the relevant operating details.
5. Locate separated bands, spots or peaks using the specified observation method.
6. Compare the test pattern with the standard and calculate the appropriate separation metric.

Observation Record

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

Observation / parameter	Record / finding
Plant basis	_____
Recovered oil amount	_____
Oil appearance	_____
TLC pattern	_____
Standard comparison	_____

Calculations and Interpretation

- Oil recovery = recovered oil amount/defined plant-material amount, with the reporting units stated.
- R_f = spot-centre distance/solvent-front distance.

Worked Illustration

Illustration: a spot travelling 3.0 cm with a solvent front travelling 6.0 cm has $R_f = 0.50$.

The values in this illustration are for calculation practice.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Keep application concentrated and avoid overloading.
- Record the solvent front immediately for planar chromatography.
- Use retention or migration data only with the stated system and relevant identity evidence.

Viva Questions

1. Why does overloading impair separation?

It broadens bands or spots and can change apparent migration or retention.

2. Why run a comparison standard?

It supplies a relevant reference pattern under the same analytical conditions.

Chemical Identification of Asafoetida

Practical 15 | Pharmacognosy and Phytochemistry II

Aim

To identify Asafoetida, and interpret the recorded observations.

Principle

- An oleo-gum-resin; identification combines physical appearance with the assigned gum, resin and volatile-component evidence.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- State the material type and the constituent class assessed by each assigned reaction.
- Record a positive result only when the relevant comparison and reagent control support it.

Materials and Apparatus

- Authenticated asafoetida teaching material and assigned completed chemical-test/comparison records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Physical appearance	_____
Assigned test	_____
Test observation	_____
Comparison/control	_____
Identification conclusion	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Chemical Identification of Benzoin

Practical 16 | Pharmacognosy and Phytochemistry II

Aim

To identify Benzoin, and interpret the recorded observations.

Principle

- A balsamic resin; characteristic aromatic-acid/resin evidence is interpreted with an authenticated comparison.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- State the material type and the constituent class assessed by each assigned reaction.
- Record a positive result only when the relevant comparison and reagent control support it.

Materials and Apparatus

- Authenticated benzoin teaching material and assigned completed chemical-test/comparison records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Physical appearance	_____
Assigned test	_____
Test observation	_____
Comparison/control	_____
Identification conclusion	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Chemical Identification of Colophony

Practical 17 | Pharmacognosy and Phytochemistry II

Aim

To identify Colophony, and interpret the recorded observations.

Principle

- Rosin is a resin-acid-rich material; resin behaviour and the assigned acid-related test support identification.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- State the material type and the constituent class assessed by each assigned reaction.
- Record a positive result only when the relevant comparison and reagent control support it.

Materials and Apparatus

- Authenticated colophony teaching material and assigned completed chemical-test/comparison records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Physical appearance	_____
Assigned test	_____
Test observation	_____
Comparison/control	_____
Identification conclusion	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Chemical Identification of Aloes

Practical 18 | Pharmacognosy and Phytochemistry II

Aim

To identify Aloes, and interpret the recorded observations.

Principle

- A dried leaf exudate containing anthraquinone-related constituents; prepared class-test evidence is combined with material identity.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- State the material type and the constituent class assessed by each assigned reaction.
- Record a positive result only when the relevant comparison and reagent control support it.

Materials and Apparatus

- Authenticated aloes teaching material and assigned completed chemical-test/comparison records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Physical appearance	_____
Assigned test	_____
Test observation	_____
Comparison/control	_____
Identification conclusion	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Chemical Identification of Myrrh

Practical 19 | Pharmacognosy and Phytochemistry II

Aim

To identify Myrrh, and interpret the recorded observations.

Principle

- An oleo-gum-resin; the gum/resin proportions and physical/class-test evidence support comparison with authenticated material.
- Crude-drug identity is established through a combination of macroscopic, microscopic and chemical characteristics.
- A chemical class test is supportive and does not alone distinguish all adulterants or substitute materials.
- State the material type and the constituent class assessed by each assigned reaction.
- Record a positive result only when the relevant comparison and reagent control support it.

Materials and Apparatus

- Authenticated myrrh teaching material and assigned completed chemical-test/comparison records.
- Authenticated drug material, a prepared comparison specimen or atlas, and assigned test reagents.
- Hand lens, microscope with prepared sections or powder mounts, glassware and a record sheet.

Method

1. Record the drug name, plant part or material type and the condition of the provided specimen.
2. Examine the macroscopic characters without tasting the material.
3. Study assigned prepared sections or powder mounts and sketch distinguishing structures.
4. Observe the assigned class test with the necessary positive or reagent comparison.
5. Combine the visible, microscopic and chemical evidence rather than relying on one feature.
6. Write a reasoned identification statement and document differences from the authenticated comparison.

Observation Record

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

Observation / parameter	Record / finding
Physical appearance	_____
Assigned test	_____
Test observation	_____
Comparison/control	_____
Identification conclusion	_____

Calculations and Interpretation

- Qualitative identity exercises usually require a structured comparison rather than a numerical calculation.

Result

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

Finding: _____

Conclusion: _____

Precautions

- Use an authenticated comparison and retain the specimen identity.
- Do not taste crude drugs or infer a clinical dose from an identification test.
- Distinguish a characteristic finding from a feature that can vary with processing or age.

Viva Questions

1. Why combine several identification features?

One character may be shared by unrelated materials or altered by processing.

2. Does a class test establish drug purity?

No. It indicates a chemical group and must be combined with other evidence.

Hospital Training I - Activity and Report Guide

Guide 01 | Hospital Training I

Aim

To organize the required hospital placement and prepare a clear report of the activities actually completed.

Principle

- The course requires hospital training for a minimum of 45 days. Its learning areas include first aid, injection routes, patient observation charts, prescriptions and dispensing, and simple diagnostic reports.
- A training or project report links the stated objective to documented activity, observations and conclusions.
- Report only work actually completed and protect confidential institutional and patient information.
- Hospital Training I may be undertaken at the end of Semester 4; Hospital Training II may be undertaken at the end of Semester 6.
- Activities involving patients remain under authorized clinical supervision. These notes are an observation and reporting guide.

Materials and Apparatus

- Hospital supervisor, approved rotation schedule, attendance register, anonymized teaching cases and a daily learning log.
- Supervisor-approved plan, institutional instructions, observation log and permitted supporting records.
- Report-writing software and a dated activity log.

Method

1. Confirm the hospital placement, supervisor and rotation plan through the institution.
2. Maintain daily attendance and identify the department and activity studied.
3. Observe first-aid teaching with trained staff; record the purpose of wound care and resuscitation demonstrations.
4. Identify injection-route names and their general differences through supervised teaching material.
5. Study anonymized observation charts, prescriptions, dispensing records and diagnostic reports with the supervisor.
6. Prepare the report from verified activities and have the supervisor review the learning log.

Learning Areas

First aid

Record the purpose of wound assessment, clean dressing practice, escalation and resuscitation teaching. Describe the supervised demonstration observed.

Injection routes

Compare intravenous, intramuscular, subcutaneous and intradermal routes by anatomical destination and general use. Record the teaching demonstration rather than patient identifiers.

Observation charts

Identify dated entries for vital signs, medication administration, intake/output and clinician instructions. Preserve units and describe trends only with supervisor guidance.

Prescription and dispensing

Record the checks demonstrated for identity, medicine name, strength, dosage form, directions, interactions or omissions, storage and labelling. Escalate uncertainty to the supervising pharmacist.

Diagnostic reports

Identify the test name, unit, laboratory interval and clinical context shown in anonymized teaching material. A laboratory interval alone does not establish a diagnosis.

Report Arrangement**Opening pages**

Title, student details, placement dates, institution, supervisor acknowledgement and contents.

Hospital overview

Describe the hospital and departments actually visited. Explain the pharmacy service and its coordination with other departments.

Daily activities

Use a table of dates, department, observations and learning outcomes. Add only permitted anonymized case examples.

Closing pages

Present learning outcomes, limits of the exposure, conclusion and verified attendance or supervisor documents required by the institution.

Submission Check**Before submission**

Check the minimum 45-day duration, consistent dates, removal of identifying information, readable tables and the institution's prescribed signatures and copies.

Observation Record

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

Observation / parameter	Record / finding
Date and department	_____
Activity observed	_____
Learning outcome	_____
Supervisor feedback	_____
Attendance days	_____

Calculations and Interpretation

- Total completed days = sum of verified attendance days.
- Record the actual duration and any absence; a scheduled day is not automatically a completed day.

Result

Present the completed activity log, learning outcomes and report prepared from actual work, with the required supervisor confirmation.

Finding: _____

Conclusion: _____

Precautions

- Use actual attendance and findings rather than invented completion records.
- Obtain permission for institutional material and remove identifying patient details.
- Verify the submission requirements in the supplied course instructions and the institution.

Viva Questions

1. What should a student record from a hospital rotation?

The department, actual activities observed, relevant learning, supervisor feedback and dated attendance.

2. What makes a report reproducible?

A clear objective, documented method, traceable observations and a conclusion supported by those observations.

3. Why distinguish observation from interpretation?

The reader needs to know which statements are directly recorded and which are reasoned explanations.

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