

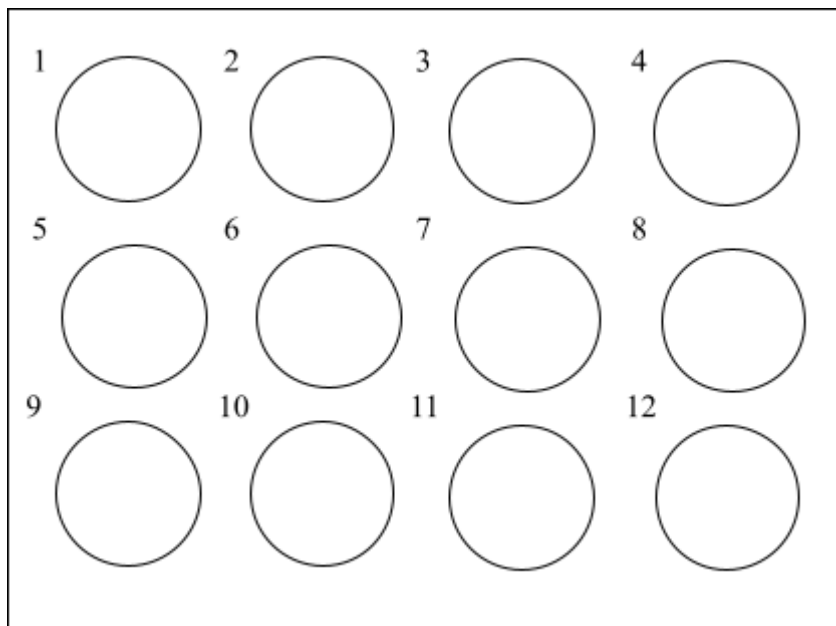
Circle Whether you performed Part A or Part B (-1 mark)

Urine Analysis Lab V5 2024– SBI4U

You will be working with a partner to complete this lab in a timely manner. One partner will do Part A (Procedure A) and the other will do Part B (Procedure B). Students whose first name starts at the beginning of the alphabet will do part A. **ONLY data may be shared electronically between partners.**

Lab Preparation: Carefully read the entire lab and the SDS sheets twice. Neatly write these answers **double spaced** on a **the separate page**. [9] Pre lab is handed in before the start of the lab, or you will get zero marks for it.

1. What is the purpose of this lab? [1] Do NOT ask your teacher for the answer!
2. Which indicators have safety concerns as shown on the SDS sheets? List the concerns[1]
3. What is the purpose of a chemical indicator? [1]
4. Label a diagram showing your plan for using the spot plate on this page. [2]
5. Research the expected colour, clarity and/or solubility results for a negative and positive test result for all four indicators used in this lab. Make a simple table to summarize your expected results. [4]



Lab Conduct Assessment- see rubric on page 5

Note:

Do not put any solutions down the drain! There will be a waste beaker at each station. All solutions are to be disposed of in this waste beaker.

Procedure Part A – Control Samples**Benedict's Solution****(Use the hot plate to complete this reaction)**

1. Label 2 test tubes, one "sample" and one "control".
2. Transfer 5 mL of glucose solution to the sample test tube and 5 mL of distilled water to the control test tube.
3. Look at each test tube and record your observations on the clarity and colour of each sample in the tables provided.
4. Add 3 drops of Benedict's Solution to each test tube.
5. Look at each test tube and record your observations on the clarity and colour.
6. Once the water has come to a boil reduce the heat as necessary to maintain a slow boil. Place the test tubes in the hot water bath for 5 minutes.
7. After 5 minutes look at each test tube and record your observations on the clarity and colour.

Sudan III

1. Fill a gold dotted test tube 1/4 full of lipid solution and regular test tube with distilled water.
2. Look at each test tube and record your observations on the clarity, colour and solubility of each sample in the attached tables.
3. Add 6 drops of Sudan III to each. Observe. Put a rubber stopper on each test tube. Mix by inverting.
4. Look closely at the test tubes, observe and record.

Use a clear spot plate with numbers on a white paper background for the following reactions**Iodine**

1. Get a clear spot plate with numbers.
2. Fill well #1 with starch solution and fill well #5 with distilled water.
3. Look at each well and record your observations on the clarity and colour of each sample in the attached tables.
4. Add 2 drops of iodine to each well.
5. Look at the wells and record your observations on the clarity and colour.

Biuret's Reagent

1. Fill well #2 with protein solution and fill well #6 with distilled water
2. Look at each well and record your observations on the clarity and colour of each sample in the attached tables.
3. Add 3 drops of Biuret's Reagent to each well.
4. Carefully look at the wells and record your observations on the clarity and colour

Part A: Observations

Recording the results for your experiment, you will only be assessed on YOUR observations.

Table 1: Results for positive and negative tests with **glucose** (2 marks)

	Glucose solution (Positive Test)	Distilled Water (Negative Test)
Before adding Benedict's reagent		
After adding Benedict's reagent		
After heating for 5 minutes		

Table 2: Results for positive and negative tests with **lipids** (2 marks)

	Lipid solution (Positive Test)	Distilled Water (Negative Test)
Before adding Sudan III reagent		
After adding Sudan III reagent		

Table 3: Results for positive and negative tests with **starch** (2 marks)

	Starch solution (Positive Test)	Distilled Water (Negative Test)
Before adding Iodine solution		
After adding Iodine solution		

Table 4: Results for positive and negative tests with **proteins** (2 marks)

	Protein solution (Positive Test)	Distilled Water (Negative Test)
Before adding Biuret's reagent		
After adding Biuret's reagent		

THIS SECTION IS FOR THE SECOND PARTNER ONLY**Part B – What food molecules are in the urine sample?**

Conduct all four tests for the urine sample and the control sample. Record observations. You must get a noticeable difference in the observed colours to make a valid conclusion.

Benedict's Solution**(Use the hot plate to complete this reaction)**

1. Label 2 test tubes, one "sample" and one "control".
2. Transfer 5 mL of URINE to the sample test tube and 5 mL of distilled water to the control test tube.
3. Look at each test tube and record your observations on the clarity and colour of each sample in the tables provided.
4. Add 3 drops of Benedict's Solution to each test tube.
5. Look at each test tube and record your observations on the clarity and colour.
6. Once the water has come to a boil reduce the heat as necessary to maintain a slow boil. Place the test tubes in the hot water bath for 5 minutes.
7. After 5 minutes look at each test tube and record your observations on the clarity and colour.

Sudan III

1. Fill a gold dotted test tube 1/4 full of URINE and regular test tube with distilled water.
2. Look at each test tube and record your observations on the clarity, colour and solubility of each sample in the attached tables.
3. Add 6 drops of Sudan III to each. Observe. Mix by inverting.
4. Look closely at the test tubes, observe and record.

Use a clear spot plate with numbers on a white paper background for the following reactions

Iodine

1. Get a clear spot plate with numbers.
2. Fill well #1 with URINE and fill well #5 with distilled water.
3. Look at each well and record your observations on the clarity and colour of each sample in the attached tables.
4. Add 2 drops of iodine to each well.
5. Look at the wells and record your observations on the clarity and colour.

Biuret's Reagent

1. Fill well #2 with URINE and fill well #6 with distilled water
2. Look at each well and record your observations on the clarity and colour of each sample in the attached tables.
3. Add 3 drops of Biuret's Reagent to each well.
4. Carefully look at the wells and record your observations on the clarity and colour

Part B: ONLY Observations: Table 5: Results for unknown urine sample (8 marks)**Unknown Urine Sample #:** _____ (1)

What is the starting colour of the sample? _____

Note: Before is before adding any indicators, after is at the end of each test.

	Benedict's test		Iodine		Sudan III		Biuret's Reagent	
	Before	After	Before	After	Before	After	Before	After
control								
urine								

Performance Criteria	Level 1	Level 2	Level 3	Level 4
Safety - recognizes safety hazards - takes appropriate precautions, goggles - behaves safely at all times Understand procedure and reasons for tasks to be performed Hair tied back Not wasting chemicals & chemicals properly disposed of.	No precautions taken, inappropriate behaviour	Some safety precautions taken, behaves well	All safety precautions taken	All precautions taken and prevents hazards
Materials Use - correctly labels all substances - checks and rechecks names of all substances - measures accurately - avoids contaminating substances - avoids wasting materials	Rarely labels, checks, or safely handles substances	Sometimes labels, checks, and safely handles substances	Usually labels, checks, and safely handles substances	Always labels, checks, and safely handles substances
Efficient Use of Time - has planned lab to minimize wasted time - has understood lab so that little time is spent rereading instructions Does not interfere with the teacher and make it difficult for them to manage the lab	Disorganized and needs help often	Sometimes disorganized and needs help	Usually organized	Always self sufficient
Clean up - all equipment cleaned, work area Envirocleaned - wastes correctly disposed of according to instructions, no contaminated equipment left out - all materials returned to distribution site - hands washed	Leaves a mess	Sometimes leaves a small mess	Leaves work area clean	Always leaves work area clean without prompting

Discussion Questions [9]

Each partner will answer only their assigned questions. All answers must be clearly and neatly written in **complete sentences** on a **separate** page. **There are an additional 2 marks for grammar, spelling and sentence structure.** Use nouns. **Avoid the use of pronouns.** All science writing must be in the third person past passive tense. For example, "The control sample was heated and the colour changed to orange from green" instead of, "I heated the sample and it changed colour which was beautiful." Use **evidence (observations)** from the lab for your conclusions. **Double space all answers.**

Partner A (Responsible for Part A): [7 marks, plus 2 communication]

1. What is a positive test for glucose? State the evidence. [2]
2. What is a positive test for lipids? State the evidence. [2]
3. How might the starting colour of the urine sample affect the interpretation of the observations? You did not conduct this test, but you need to think and answer. [1]
4. What are two different possible **sources of error** in this lab? [2] Your answer cannot be the same as your partner's.

Partner B (Responsible for procedure B) [7 marks, plus 2 communication]- Note: if you did not observe a positive test, refer to your pre-lab.

5. What is a positive test for starch? State the evidence. [2]
6. What is a positive test for proteins? State the evidence. [2]
7. Which of the four food molecules are or are **not** in your unknown urine sample? Be sure to state the **evidence** that supports your conclusion. Negative test results must also be explained. [2]
8. Name one possible **source of error** in this lab. [1] Your answer cannot be the same as your partner's.

Communication: (2)

CRITERION	LEVEL 4	LEVEL 3	LEVEL 2	LEVEL 1
Written Communication	Scientific terminology is used meticulously and correctly. There are no spelling errors. Pronouns are avoided. The answer is concise and on topic. There is a logical flow of information. All answers are double spaced on a separate page.	Scientific terminology is usually used and is correct. There are few spelling errors. The answer is fairly concise and mostly on topic. The flow of information is fairly logical.	Scientific terminology is sometimes used and is not always correct. There are frequent spelling errors. The answer is long and not always on topic. The flow of information is not well organized.	Scientific terminology is seldom used and is often incorrect. There are abundant spelling/grammar errors. The answer is rambling and much of it is off topic. The answer is disjointed and hard to follow.