

Unit 1 Practice Test

Principles of Biomedical Science · Unit 1: Medical Investigation

Name: _____ Period: _____ Date: _____

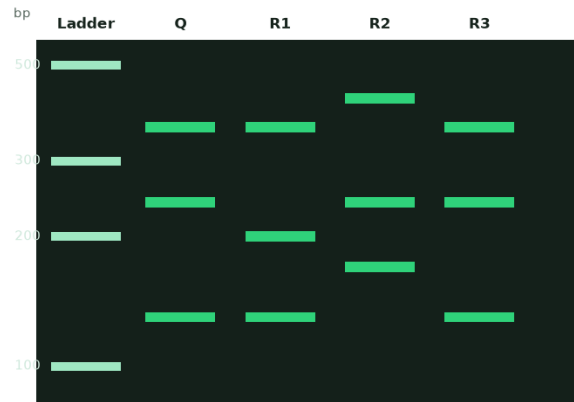
Choose the BEST answer for each question. 18 questions. Give yourself 40 minutes and no notes, like the real test. The answer key is on the last page: check your work only after you finish.

1. You are about to open a container of a clear liquid that has no smell and looks just like water. Following the class safety rules, what comes first?
 - A. Open it bare-handed, since a liquid that looks like water is safe to touch
 - B. Smell it up close first to make sure it really has no odor
 - C. Put on your assigned PPE before touching the container, whatever the liquid looks like
 - D. Put on goggles only if you plan to heat or pour the liquid, since only then can it splash
2. Before using a chemical for the first time, you need to know whether it catches fire easily and how it should be stored. Where do you look?
 - A. The chemical's safety data sheet (SDS)
 - B. The step-by-step procedure for the day's lab
 - C. The lab safety contract you signed at the start of the year
 - D. The instruction sign posted above the eyewash station
3. You measured the resting pulse of 80 students and want to show how many students fall in each 10-beat range (60 to 69, 70 to 79, and so on). Which graph should you make?
 - A. A pie chart with one slice for each student
 - B. A histogram with one bar for each 10-beat range, showing how many students fall in it
 - C. A line graph connecting the pulses in the order they were measured
 - D. A scatter plot of each student's pulse against their seat number
4. A fiber sample's source tag gives where it was found and who collected it, but no item number was ever written on it. Which intake-log entry is correct?
 - A. Item number: F-12, the next open number on my log
 - B. Item number: 0417, the photo number, since it already points to this fiber
 - C. Item number: left empty, to be filled in later
 - D. Item number: unassigned, because no number appears on the source tag
5. A custody log shows the date an evidence box went into the storage locker and who delivered it, but no receiver name was written. How should the receiver field read?
 - A. The evidence manager's name, since that person usually receives boxes
 - B. Receiver not reported, flagged so it gets checked
 - C. The receiver's name from the entry just above it in the log
 - D. Nothing for now; the name can be added when the case closes
6. An evidence envelope arrives with its seal intact, but the custody log has no receiver signature for the handoff. What does this establish?
 - A. The intact seal proves the custody record is complete
 - B. The missing signature proves that someone tampered with the envelope
 - C. The package looks sound, but the handoff is not documented; record the gap and check it
 - D. The envelope must be thrown out, because one missing signature cancels all of the evidence inside it

7. A classmate recorded a shell casing on a scene sketch as "120 cm from the door hinge." Why can't someone else put the casing back in exactly the same spot?
- A. One distance only places it somewhere on a circle around the hinge, so a second fixed point is needed
 - B. The distance should have been measured in inches instead of centimeters
 - C. Measurements are not needed, because a labeled photograph would place the casing better than any tape measure
 - D. The record is missing the time of day the measurement was taken
8. You are logging a hallway security video. Which of these entries records an observation, not an inference?
- A. The person in the red jacket was the victim's roommate, who lives down the hall
 - B. The person looked nervous and was hiding something
 - C. The person came to take something from the room
 - D. The video shows a person in a red jacket walking past the camera at 9:14 PM
9. Using the ABO model from class: the cells from a stain stay smooth in the anti-A serum well, and they clump when anti-B serum is added. What is the model call?
- A. Type B, because the cells carry the B marker and not the A marker
 - B. Type A, because the anti-A well stayed smooth
 - C. Type AB, because one of the two wells clumped
 - D. Type O, because one of the two wells stayed smooth
10. A stain's classroom ABO call is O. Reference cards: Person 1 is type O, Person 2 is type O, and Person 3 is type B. Which statement is best supported?
- A. Person 1 or Person 2 left the stain, since they are the only two reference cards that match it
 - B. No one is excluded, because blood types are shared by many people
 - C. Person 3 is excluded; Persons 1 and 2 are not excluded, and this test cannot tell them apart
 - D. Person 3 is not excluded, because type B can look like type O in the model
11. A questioned hair from a scene is described and recorded. A known reference hair is in the evidence envelope, but the label naming whose hair it is was lost. What comparison result should the report state?
- A. Consistent with the person of interest, since the reference was collected for this case
 - B. Excluded, because a reference without a label cannot match anything
 - C. Identified, because the two hairs look alike under the microscope
 - D. Inconclusive, because the known reference hair no longer has a stated source

12. Use the gel below. Lane Q is the questioned stain, and lanes R1, R2 and R3 are reference samples. Which reference or references can NOT be ruled out as the stain's source?

STR bands: questioned stain and three references



- A. R1 only, because most of its bands line up with Q
 - B. R3 only, because every one of its bands lines up with a band in Q
 - C. R1 and R3, because both share Q's top band
 - D. R1, R2 and R3, because each shares at least one band with Q
13. A presumptive blood screen on a dark stain on a door handle turns positive. What should the record say?
- A. The stain may contain blood; a confirmatory test is needed before calling it blood
 - B. The stain is blood, because a positive presumptive screen confirms it
 - C. The stain is blood from the person who lives in the home, since it was found on their door handle
 - D. The screen should be repeated until it gives a negative result
14. A presumptive blood screen on a swab of carpet is negative. Your partner writes "no blood on the carpet." Which wording should replace it?
- A. The screen failed, so the negative result should be left out of the record entirely
 - B. There is blood on the carpet, but too little to matter
 - C. Not detected by this screen on this swab, which does not prove blood is absent
 - D. No blood is present anywhere in the room
15. A screening test tells a person who IS infected that they are clear. Which term fits, and what is the risk?
- A. False positive: a healthy person may get treatment they do not need
 - B. False negative: an infected person may skip treatment and spread the infection
 - C. True negative: the test correctly shows the person is not infected
 - D. False positive: an infected person is wrongly told they are clear and sent home without treatment
16. A practice lab panel lists glucose at 142 mg/dL. Its reference range is 70 to 99 mg/dL. How should the value be recorded?
- A. Inside its range, since only values more than double the upper limit are flagged
 - B. Flagged below its range, because 142 is far from the lower limit
 - C. Flagged above its range, and the high value proves what caused the death
 - D. Flagged above its range; one flag raises a question to follow up but does not name a cause

17. A body's temperature is 34 °C in a room that stayed at 20 °C. By the cooling rule from class (a body starts near 37 °C and loses about 1 to 1.5 °C each hour early on), which statement is best supported?

- A.** About 2 to 3 hours have passed, if the body started near 37 °C
- B.** Exactly 3 hours have passed, since the body lost 3 degrees
- C.** About 14 hours have passed, since the body is 14 degrees above the room
- D.** About 1 to 1.5 hours have passed, the same as the cooling rate

18. Two slides were made from one sample of healthy liver tissue. One slide looks pale and hard to read. Which difference could explain this with no change in the tissue itself?

- A.** The pale slide came from a diseased part of the liver that was cut on the same day
- B.** The pale slide was stained for a shorter time than the other slide
- C.** The pale slide was compared with a normal reference image
- D.** The pale slide was given a different evidence code

Answer key

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Check your answers only after you finish. The Skill column gives the skill number in your study guide: for every miss, reread that skill, then try the question again.

#	Answer	Skill	Why
1	C	1	PPE only protects you if it is on before contact, and a hazard cannot be judged by how a liquid looks or smells.
2	A	1	The SDS lists a chemical's hazards, handling, storage and first-aid steps, which the procedure, the contract and the eyewash sign do not.
3	B	2	A histogram counts how many values fall in each range, while the other graphs show single values, change over time, or a relationship that does not exist here.
4	D	3	Writing unassigned keeps the missing number visible, while a made-up or borrowed number creates a false record and an empty box looks like a mistake.
5	B	3	Missing custody information is marked as not reported and checked, because a guessed or copied name is invented data and a blank looks like an oversight.
6	C	3	Package condition and custody are two separate checks, so a good seal does not document the transfer and a missing signature is a gap to record, not proof of tampering.
7	A	4	Every point 120 cm from the hinge fits the record, so a second measured distance from another fixed point (plus the side of the line) is needed to fix one spot.
8	D	5	An observation records only what the source shows, while who the person is, how they felt and why they came are explanations added to it.
9	A	6	Clumping in anti-B serum shows the B marker and no clumping in anti-A serum shows no A marker, so the call is type B.
10	C	6	A different type excludes Person 3, while a shared type only fails to exclude Persons 1 and 2, and anyone else with type O could also be the source.
11	D	6	A comparison needs a known reference with a stated source, so an unlabeled reference makes the result inconclusive, and hair features never identify one person.
12	B	6	Any band that clearly differs excludes a reference, so R1 (middle band) and R2 are excluded, and R3, which lines up at every band, is not excluded but also not proven to be the source.
13	A	7	A presumptive test is only a first screen that other substances can also trigger, so identifying the stain takes a confirmatory test.
14	C	7	A negative screen means the target was not detected by that test on that sample, which may hold too little to detect, so it cannot prove absence and it stays in the record.
15	B	7	A negative result in someone who has the infection is a false negative, and the harm lands on that untreated person and the people they could infect.
16	D	8	142 is greater than the upper limit of 99, so it is flagged high, and a single flag needs a pattern of results and other evidence before it can point to a cause.
17	A	9	The body lost $37 - 34 = 3^{\circ}\text{C}$, and $3 / 1.5 = 2$ hours while $3 / 1 = 3$ hours, so the rule supports a 2 to 3 hour window that rests on its starting assumption.
18	B	10	Stain time is a preparation variable that changes how tissue looks without changing the tissue, while disease would be a real tissue change and a reference image or code changes nothing on the slide.