



SCIENCE OLYMPIAD
AT THE
UNIVERSITY OF FLORIDA

Northern Regional: January 19th, 2019

Forensics C Answer Key

Name(s): _____

Team Name: _____

School Name: _____

Team Number: _____

Rank: _____

Score: _____

Forensics Division C Answer Key

1. Powder A

[2 pts] Chemical formula: $\text{C}_6\text{H}_{12}\text{O}_6$

[1 pt] Flame test: **melts**

[1 pt] Solubility: **soluble**

[1 pt] pH: **7**

2. Powder B

[2 pts] Chemical formula: $\text{NaC}_2\text{H}_3\text{O}_2$

[1 pt] Flame test: **yellow/orange**

[1 pt] Solubility: **soluble**

[1 pt] pH: **8**

3. Powder C

[2 pts] Chemical formula: $\text{Ca}(\text{NO}_3)_2$

[1 pt] Flame test: **red**

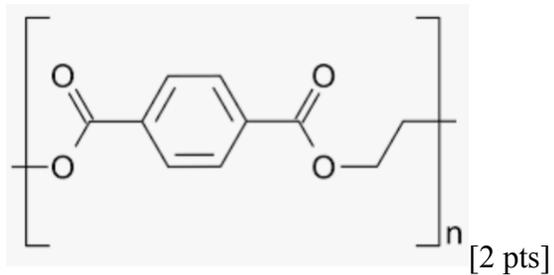
[1 pt] Solubility: **soluble**

[1 pt] pH: **7**

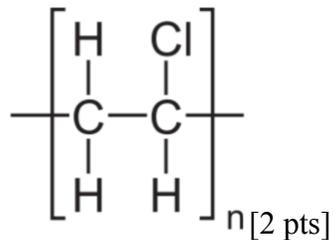
4. **sucrose is a nonreducing sugar** [2 pts]

5. **black** [1 pt] | **brown/yellow** [1 pt]

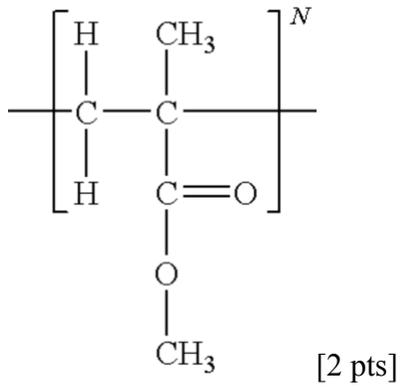
6.



7.



8.



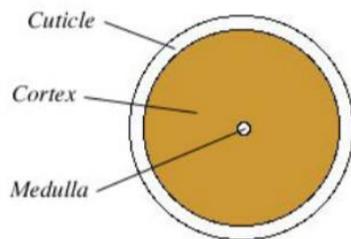
9. **polyester** [2 pts]

10. **linen** [2 pts]

11. **nylon** [2 pts]

12. **squirrel hair** [1 pt]

13. **bat hair** [1 pt]



14. [3 pts]

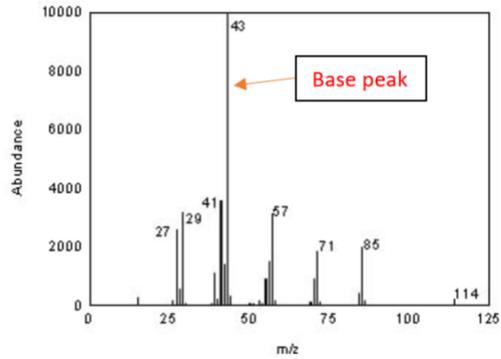
15. $2/9 = 0.222$ [2 pts]

16. $5/9 = 0.556$ [2 pts]

17. $6/9 = 0.667$ [2 pts]

18. **sample A** [1 pt]

19. [1 pt] **for correct labels (solvent front, origin), [2 pts] for accurate/clear results [tiebreaker]**



20. [1 pt]
21. **114 g/mol** [1 pt]
22. **octane** [2 pts]
23. **c) stratified squamous epithelial** [1 pt]
24. **b) They are formed during gestation.** [1 pt]
25. **plain arch, double loop whorl, tented arch, radial loop** [4 pts]
26. **ninhydrin and iodine fuming** [1 pt]; **paper is a porous surface** [1 pt]
27. **d) reptilian/amphibian** [1 pt]
28. **amphibian RBCs have nuclei, human RBCs do not** [1 pt];
amphibian RBCs are capable of dividing on their own, human RBCs cannot [1 pt];
amphibian blood lacks platelets [1 pt];
amphibian RBCs are larger and more oval, human RBCs are smaller and circular [1 pt]
 [tiebreaker]
29. **B+** [2 pts]; **can receive B+, B-, O+, O-** [2 pts]
30. **III, IV**[2 pts]

31. Crime Analysis

-mention that Daisy was likely the one who committed the crime (4 pts)

-mention that Azalea was likely also involved in the crime (3 pts)

-mention that Aster and Lily are likely innocent (2 pts)

-describe the evidence and motives linked to each suspect

Suspect A: Azalea

-pen matches ink (1 pt)

-matching fingerprint (1 pt)

-motive: as neighbors, victim's taste for heavy metal music frequently incites her migraines (1 pt)

Suspect B: Aster

-magnesium sulfate (1 pt)

-magnesium sulfate used to treat sprains (1 pt)

-would have been at the spa at the time of the murder (1 pt)

Suspect C: Lily

-no evidence linking her to crime scene (1 pt)

-no motive: gets along very well with victim (1 pt)

Suspect D: Daisy

-calcium nitrate (1 pt)

-calcium nitrate used in fertilizers, link to gardening hobby (1 pt)

-sodium bicarbonate (1 pt)

-sodium bicarbonate is baking soda, link to baking hobby (1 pt)

-squirrel hair (1 pt)

-squirrel hair linked to hobby of exploring forests (1 pt)

-matching blood type (1 pt)

-motive: bitter about not being promoted despite working alongside victim for a decade, needed money for new house (1 pt)