Forensics

Answer Sheet

School Name	
Team #	
Student 1	
Student 2	

Part 1 - Qualitative Analysis (20 pts)	
Exhibit E (2 pts)	potassium chloride
Exhibit F (2 pts)	glucose
Exhibit G (2 pts)	sodium carbonate
Exhibit H (2 pts)	cornstarch
Exhibit I (2 pts)	potassium chloride
Q2 (2 pts)	baking soda
Q3 (2 pts)	$NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2$
Q4 (1/2 pt)	water
Q5 (1/2 pt)	carbon dioxide
Q6 (2 pts)	23.4 g
Q7 (2 pts)	$Li2CO_3 + 2HCl \rightarrow 2LiCl + CO_2 + H_2O$

Q8 (2 pts)	Name	Copper (II) sulfate	Chemical Formula	$CuSO_4$
	Name	Sodium hydroxide	Chemical Formula	$NaOH$

Part 2A - Polymers (5 pts)		Part 2B - Hair (5 pts)	
Q1 (2 pts)	LDPE	Q1 (2 pts)	dog
Q2 (1 pt)	1	Q2 (1 pt)	post-mortem root band
Q3 (1 pt)	PETE	Q3 (1 pt)	negroid
Q4 (1 pt)	PS (polystyrene)	Q4 (1 pt)	beard (face)

Part 2C - Fibers (10 pts)			
Exhibit J (2 pts)	cotton	Q3 (1 pt)	silk
Exhibit K (2 pts)	silk	Q4 (1 pt)	imbricate
Exhibit L (2 pts)	polyester	Q5 (1/2 pt)	no DNA
Q2 (1 pt)	cotton	Q6 (1/2 pt)	root or hair bulb

Part 3 - Chromatography (15 pts)	
Q1 (4 pts)	N3
Q2 (2 pts)	C
Q3 (2 pts)	B
Q4 (3 pts)	0.62
Q5 (2 pts)	DDD
Q6 (2 pts)	DDD

Judges' Use Only

Penalties	Raw Score	
Safety (-1 pt @)	Penalty Pts	
[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	Final Score	
Not Cleaned Up (-10) [ ]		
	Rank	

Part 4A - Fingerprint Analysis (11 pts)			
Q1 (2 pts)	Robbie Roley	Q8 (1 pt)	amino acids
Q2 (1 pt)	double loop	Q9 (1 pt)	sublimation
Q3 (1 pt)	ulnar loop	Q10 (1 pt)	25 / 19 W / W
Q4 (1 pt)	arch	**Part 4B - Spatter (4 pts)**	
Q5 (1 pt)	bridge	Q1 (1 pt)	(26.0 , 14.0)
Q6 (1 pt)	bifurcation	Q2 (2 pts)	68.2°
Q7 (1 pt)	island	Q3 (1 pt)	right

Part 5 - Analysis of the Crime (30 pts)	
Q1 (10 pts)	Depending on supportive explanation, either Robbie Roley or Billy Brown is the prime suspect. Powders point to Billy; Billy was in the room. Chromatography points to Robbie; she wrote the note. It was Robbie's fingerprint on the bail; she may have hit Mr Davis or as Lab Assistant would have had occasion to handle the bucket. Either name should be accepted if supported sufficiently.
Q2 (10 pts)	Depending on the answer to Q1, either Billy Brown or Robbie Roley is the second most likely suspect. See notes in Q1.
Q3 (5 pts)	Possible answers... Hair: hair on Mr Davis was from a dog. Fibers: none matched; Robbie may have removed her coat; Billy may have disposed of his coat.
Q4 (3 pts)	Answers will vary; accept any reasonable answer that is explained. Possible answers may include... alibis; video survelance; find the missing coats; fingerprints on door jamb(?)
Q5 (2 pts)	Answers will vary; accept any reasonable answer that is explained. The motive should be applied to suspect named in Q1. Possible answers may include... Robbie - unappreciated; Billy - nearly failing;