Name: Date: Period:

**Calculating Time of Death using Algor Mortis**

Working in pairs, answer the following questions using this information:

 For the first 12 hours, the body loses 0.78°C (1.4°F) per hour.

 After the first 12 hours, the body loses about 0.39°C (0.7°F) per hour.

 **Temperature loss = rate x time**

Be aware of conditional factors and how those might logically affect the rate of loss.

**PART A**

Case 1: An elderly man is found deceased in his apartment. His body temperature is 33.1°C (91.6°F).

Case 2: A body found outside in the winter has a temperature of 33.1°C. Has the body been dead a longer or shorter time than Case 1? Explain your answer.

Case 3: Approximately how long has the victim been dead if his body temperature was 25.9°C (85.2°F)?

Case 4: What is the approximate time of death if the body temperature was 10°C (50°F)?

**PART B**

Describe the impact on time of death for each of the variables listed below. Would you increase or reduce your approximate time of death if the body had been:

1. Naked
2. Exposed to windy conditions
3. Suffering from an illness prior to death
4. Submerged in a lake

**PART C**

Case 5: A woman is found dead on a boat floating in the middle of a lake at 4:30am. There is blunt force trauma to her head but no other discernable damage. She is approximately 30 pounds overweight. She is wearing thermal clothing and a winter jacket, gloves, and hat. Climatological data indicate it was a clear, cold, and windy night with no precipitation. Calculate the time of death based only on a body temperature of 15.6°C (60.8°F)? Now consider the other factors presented. How would each affect this estimation?

Case 6: A woman is found dead in a stream at the bottom of a ravine. The cause of death is determined to be a fall from a nearby cliff. Mechanism of death is exsanguination (there was virtually no blood left in her body). What is the approximate time of death if the body temperature was 29.4°C (84.9°F)? Will any other factors influence the time of death and how so? Explain your answers.

Case 7: A young man is found dead in his fraternity house at 7pm. He is naked and there are signs of recent hazing including bruising on his wrists, ankles, and neck. His blood alcohol level is three times the legal limit and his stomach contents reveal large amounts of undigested alcohol. His trachea is scratched and bloody. His body is found on the concrete floor of the basement. What is the approximate time of death if the body temperature was 24°C (75°F)? Will any other factors influence the time of death and how so? Explain your answers.

Case 8: A man’s body is found in a locked car which was left idling in his garage. The car was running and the heat was left on. He is found in only a bathrobe. It is mid-January and the exterior temperature is near freezing. His body temperature was found to be 32.2°C (90°F). Calculate the time of death based only on a body temperature. Now consider the other factors presented. Would any affect this estimation? If so, how?

**Using Insect Activity to Determine Time of Death**

Using the following information, answer the questions below.

1. The dead body contained evidence of blowfly infestation. The larvae were collected and reared in a lab in an environment similar to the conditions surrounding the dead body. Adult flies mated and laid eggs. Data was collected, noting the time required to progress from one stage to the other, and recorded in the Data Table below.

|  |
| --- |
| **Life Cycle of Insects Collected from Dead Body** |
| **Stage** | **Accumulated Time Since Egg Was Laid (Hours)** | **Accumulated Time Since Egg Was Laid (Days)** |
| Egg | Egg laid minutes after death | 0 |
| Larva stage 1 | 24 | 1 |
| Larva stage 2 | 60 | 2.5 |
| Larva stage 3 | 96–120 | 4–5 |
| Pupa | 192–288 | 8–12 |
| Adult | 432–576 | 18–24 |

 a. Record the estimated time since death if the insects recovered from the dead body were in each of the following stages.
 1. Egg:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 2. Larva 1:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 3. Larva 2:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 4. Larva 3:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 5. Adult:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b Record the estimated time since death if the insects recovered from the dead body were in each of the following stages.
 1. Some eggs and some larva 1:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 2. Some adults and some pupa:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 3. Larva in stages 2 and 3:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. A dead body of an elderly gentleman was discovered in an abandoned building. Blowfly pupae were found on the body. A missing person’s report was filed for an elderly gentleman who had wandered away from home just two days before. The body found was similar in age, height, and weight to the missing person. Could this possibly be the same person as the person described in the missing person’s report? Explain your answer.

8. A dead body was found with adult blowflies and blowfly eggs. A suspect is arrested. The suspect hires an expert witness who claims that the suspect cannot be guilty because the presence of adult blowflies indicates that the body was there for 18-24 days. The suspect was out of the country during this time period. As the expert entomologist for the police, do you agree or disagree with these findings? Explain.