Lesson 19 — Logic

Problem 1: translation (20 points)

Write the statements below in symbolic form using $\neg$, $\wedge$, $\vee$, and the letters:

- h = "Jon is healthy"
- w = "Jon is wealthy"
- s = "Jon is wise"

(a) "Jon is wealthy and healthy but not wise."
(b) "Jon is not wealthy but he is healthy and wise."
(c) "Jon is neither healthy, wealthy, nor wise."
(d) "Jon is neither wealthy nor wise but he is healthy."
(e) "Jon is wealthy, but he is not both healthy and wise."

Problem 2: de Morgan's laws (5 points)

Which of the following is the correct negation of "Both Abe and Ben are tall."?

(a) "Abe is tall, and Ben is tall."
(b) "Abe is not tall, and Ben is not tall."
(c) "Abe is tall, or Ben is tall."
(d) "Abe is not tall, or Ben is not tall."

Problem 2: de Morgan's laws (5 points)

Which of the following is the correct negation of "Both Abe and Ben are tall."?

(a) "Abe is tall, and Ben is tall."
(b) "Abe is not tall, and Ben is not tall."
(c) "Abe is tall, or Ben is tall."
(d) "Abe is not tall, or Ben is not tall."

Problem 3: de Morgan's laws (5 points)

Which of the following is the correct negation of "Jon is wealthy, but he is not both healthy and wise."?

(a) "Jon is not wealthy, but he is both healthy and wise."
(b) "Jon is not wealthy, or he is both healthy and wise."
(c) ""Jon is not wealthy, and he is both healthy and wise.""
(d) "Jon is not wealthy, or he is neither healthy nor wise."