QUESTIONS FROM PROF. A. DOUGLAS STONE,
EINSTEIN AND THE QUEST FOR THE QUANTUM (2013)

Obviously Doug Stone is a distinguished professor of physics at Yale. He was a regular lecturer in "the genius class." This book is not so much a complete biography of Einstein but rather an attempt to situate him in his moment in history. Are there ages of genius? If so, the nexus of people and ideas swirling around Einstein, first in Berne, and radiating out to London, Paris, Vienna, Berlin, and the Netherlands created one of them. It is often said that Einstein was "the last of the solitary geniuses," as you read through this, think about the ways Einstein was solitary and the ways that he was not.

Chapter 4, "Two Pillars of Wisdom" [by the end you should be able to identify what they are]

p. 26: Right from the outset we meet Faraday. Think about who he was and his importance to science and potential influence on E. Obviously E. doesn't think much of narrow specialization. Speculate here. Why might specialization "destroy poetry?"

p. 26: Note E's eternal sense of humor (which is built on irony). Irony is built on what kind of thinking? (choose the best answer)

a. supportive b. contrarian (oxymoronic) c. divergent d. combinative

pp. 26:. E had just graduated from college (in effect) and was on the job market, sending out batches of cover letters and resumés all around. How well was he doing? (Was he recognized as a genius?) A. Not well at all B. Had three job offers. C. Could pick whatever job he wanted.

p. 26: When Einstein found no job, whom did he blame, himself or another. Circle one

p. 27: Who and what is E studying to understand the structure of the atom?

a. Faraday and electricity b. Maxwell and electromagnet waves c. Plank and thermodynamics

pp. 27-28: A useful review of Newtonian physics. Which of the following is an accurate description of this?

a. A closed universe which operated uniformly and universally according to a set of mathematically verifiable laws
b. A closed universe in which objects moving near the speed of light require special treatment
c. A closed universe in which objects behave differently at a nanoscopic level

pp. 28-30. As you read through these pages you get a sense that science is an (actively or passively) collaborative process. Is this a case, as Ivo of Chartres said 1,100 years ago, "If I can see farther it is because I'm standing on the shoulders of giants?"

pp. 28 and your knowledge: What is Newton's Law of Gravity?

a. The gravitational acceleration on earth's surface is 9.8 m/s^2x4(or the force of gravity acting between any two objects is directly proportional to the square of the separation distance between the object's centers).
b. Two masses experience an attraction along the line between their centers with the strength of the attraction inversely proportional to the square of the distance between them.
c. An object in motion will stay in motion unless stopped by the gravitational force of an external force.

pp. 29-31: Arrange in the proper sequential order in which one scientist built upon the work of another:

Newton Maxwell Faraday Galileo 1) _____ 2 _____ 3 _____ 4) _____

(Talk about hitting a target no one else can see!) What did Faraday, looking forward to the future of electricity, say to the prime minister of England?
a. To find its value, Sir, go fly a kite!
b. One day, Sir, it will instantaneously bind the Empire
c. One day, Sir, you may tax it.
d. One day, Sir, it will power the iron horse.

p. 31: Discussion here of which enabler of genius possessed by Einstein?
a. concentration b. curiosity c. consistency d. contemplation

p. 32: Judging from the personalities of Einstein and Maxwell (whom Stone identifies as two of the three all-time geniuses of physics), is the genius a retiring loner?
a. Yes b. Sometimes c. No

p. 32: As we saw with E earlier, in what kind of humorous thinking does Maxwell engage when he is discuss a vacuum?
a. contrarian (oxymoronic) b. divergent c. combinatorial d. supportive

p. 33-34: The work of James Clerk Maxwell seems to be the basis of the recognition of what kind of rays? (name four) _____, _____, _____, and _____

That an extremely small percentage of the U.S. population would recognize the name (Maxwell) and know of his extraordinary accomplishments suggests:
a. Genius is subjective and sometimes society fails to fully recognize it
b. Most people in the U.S. are more or less illiterate with regard to theoretical physics
c. Perhaps one day his accomplishments will be full recognized
d. All of the above e. None of the above

p. 34: Mozart died at the peak of his career at the age of 35. How old was Maxwell? _____

(And please look up: how old was Maxwell when he published his definitive study of electromagnetic waves?))

p. 35 top: Interesting observation made by E: one person could sit somewhere and suddenly realize: "I have figured out how the world works!" (This might be as close to the insight of a genius as we get, though it doesn't do much to explain how this happens.)

p. 35: What physics did Maxwell and Newton's laws not explain?

a. The fundamentals of electrodynamics
b. The fundamentals of mechanics
c. The fundamentals of the composition of the universe

You are welcome to read chapters5 and 6 which are relevant to genius. But for our class, this is plenty enough.