



Any guesses?
The drummer, who is probably the least-famous of them all, is the only member who has been with the band from the very beginning.

Here are a list of conceptual questions, the sort of which you will be asked to answer when you take your exam on Friday. You should be able to answer these questions from having carefully read the chapters. I would expect that, if any of these questions showed up on Friday's test, everyone would be able to answer them completely and concisely—and relevantly.

1. What is the difference between a longitudinal and transverse wave?
2. How do we know that light is a transverse wave?
3. Briefly state the superposition principle.
4. What is the significance of the condition that $\mathbf{k} \cdot \mathbf{r} = \text{constant}$ for a plane wave?
5. What does it mean to state that \mathbf{E} is linearly polarized in the y -direction?
6. Show that $\mathbf{k} \times \mathbf{E} = \omega \mathbf{B}$.
7. What is the physical meaning of the magnitude of the Poynting vector? Why is it necessary to take a time-averaged value?
8. As an e-m wave travels through space, what carries more energy, the \mathbf{E} field or the \mathbf{B} field?
9. Distinguish between irradiance, optical power, and radiant flux density.
10. How do we know that light is a stream of quantized photons?
11. How does the fact that photons are bosons (as opposed to fermions) explain why light appears continuous?
12. Distinguish between coherent and incoherent light.
13. Why does the probability distribution for the number of photons arriving at a detector depend on the type of light?
14. Why doesn't a stationary charge radiate e-m energy?
15. Why does a charge moving with constant velocity not radiate e-m energy?
16. For a linearly accelerating charge, in what direction will the irradiance be greatest?
17. Describe the process by which a ground-state valence electron can make a quantum jump.
18. Dissipative absorption?
19. What is the difference between resonant and non-resonant, or ground state, scattering?
20. Distinguish between orientational, electronic, and ionic polarization.
21. Why does the index of refraction of a medium depend on the frequency of the incident radiation?