Closed book, closed notes. Clearly circle ("O") the one choice that you think is most definitely correct. Cross out (" \times ") only one choice that you think is definitely incorrect.

- 1. [4.0 points.] On the sun, sunspots appear darker than the photosphere, because these sunspots:
 - (A) are cooler.
 - (B) absorb light.
 - (C) lack hydrogen.
 - (D) sink downwards.
- **2**. [4.0 points.] The absorption lines of a star are produced by:
 - (A) parallax.
 - (B) electrons moving to lower energy levels.
 - (C) blackbody radiation passing through diffuse, cool gas atoms.
 - (D) the difference between apparent magnitude and absolute magnitude.
- **3**. [4.0 points.] Absorption lines of star moving towards Earth will have slightly ______ than absorption lines of a stationary star.
 - (A) smaller parallaxes.
 - (B) shorter wavelengths.
 - (C) brighter luminosities.
 - (D) brighter apparent magnitudes.

For questions (4)-(6), the apparent magnitudes and absolute magnitudes of two stars are listed at right.

	m	$ \mathcal{M} $
	apparent	absolute
	magnitude	magnitude
Aldebaran	+0.9	-0.6
Capella Ab	+0.9	+0.4

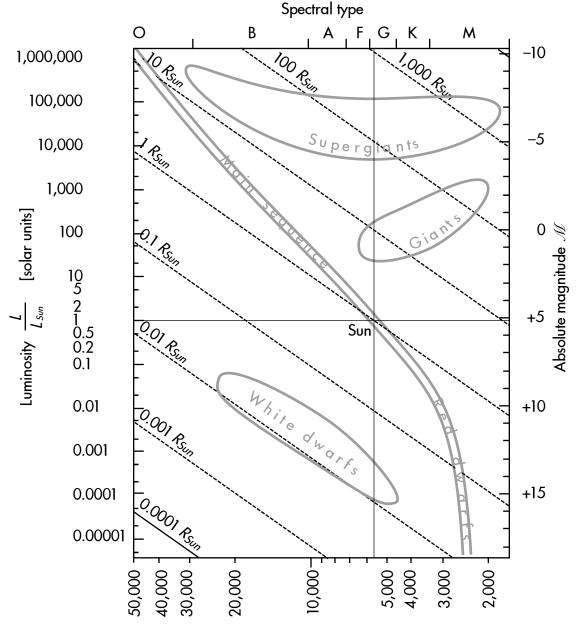
- **4**. [4.0 points.] As seen from Earth, the star that seems dimmest is:
 - (A) Aldebaran.
 - (B) Capella Ab.
 - (C) (There is a tie.)
 - (D) (Not enough information is given.)
- **5**. [4.0 points.] When placed at 10 parsecs away, the star that is dimmest is:
 - (A) Aldebaran.
 - (B) Capella Ab.
 - (C) (There is a tie.)
 - (D) (Not enough information is given.)
- **6**. [4.0 points.] The star that is farthest away from Earth is:
 - (A) Aldebaran.
 - (B) Capella Ab.
 - (C) (There is a tie.)
 - (D) (Not enough information is given.)
- 7. [4.0 points.] Giants and supergiants are very common in the night sky, as seen from Earth with the naked eye, because they:
 - (A) have low luminosities.
 - (B) are visible from very far away.
 - (C) are much closer than 10 parsecs.
 - (D) have long main-sequence lifetimes.

Questions (8)-(10) are continued on the back of this page.

Closed book, closed notes. Clearly circle ("O") the one choice that you think is most definitely correct. Cross out (" \times ") only one choice that you think is definitely incorrect.

This quiz continues from questions (1)-(7) on the other side of this page.

- **8**. [4.0 points.] Which star is the hottest?
 - (A) A5 main sequence star.
 - (B) F0 supergiant.
 - (C) B5 white dwarf.
 - (D) M0 red dwarf.
 - (E) (There is a tie.)
- 9. [4.0 points.] An A5 white dwarf has a _____ than a G5 supergiant.
 - (A) brighter luminosity.
 - (B) larger size.
 - (C) hotter temperature.
 - (D) (Two of the above choices.)
 - (E) (All of the above choices.)
 - (F) (None of the above choices.)
- 10. [4.0 points.] A B5 main sequence star and an M5 giant could have the same:
 - (A) luminosity.
 - (B) size.
 - (C) temperature.
 - (D) (Two of the above choices.)
 - (E) (All of the above choices.)
 - (F) (None of the above choices.)



Surface temperature T [Kelvin]