You are to complete this take home exam on your own. If you have any questions, please seek assistance from your faculty. This exam is due on Thursday, May 17th.

**Part I. Fill in and short answer.**
Instructions: Fill in the blank or, for short answer questions, write in your answer. Use complete sentences. **Improper English usage will lower your grade** (your English teachers were correct when they told you that writing was important!).

What do we mean when we say a telescope is big?

What is the principle function of a telescope?

If you go to an observatory and look at a telescope, how can you tell if it is:

a refractor? ________________________________

a reflector? ________________________________

Galileo’s telescope was a ________________.

Newton’s telescope was a ________________.

On our observation session at the Pinnacles the optical system of the telescopes we used were ________________ and they used a _______________ type of mount.

What is the limiting magnitude of a telescope?

Why is the Dawes’ limit of a telescope important?

Suppose you are observing M44. What is the significance of the designation? What are you looking at?

Suppose you are given a telescope with a 3-inch diameter lens with a focal length of 36 inches and an eyepiece with a focal length of ½ inch. What is the **magnifying power** of the telescope? **Show me your calculations, not just the answer.**
Write the name of point a and lines b and c labeled in the diagram at the left. Note the person at the center with the sky above them:

a. _______________________

b. _______________________

c. _______________________

Write the names of lines a, b, c and d identified in the diagram at the left:

a. _______________________

b. _______________________

c. _______________________

d. _______________________

What are the coordinates of the point marked on the celestial sphere at the left? Fill in the blanks and be sure to include the proper units.

_________ R__________ A__________

_________ D___________
As viewed from Saratoga or the Pinnacles, the stars seen in the north move __________ along diurnal paths and those seen in the south move ______________.

The measured altitude of Polaris is related to your ____________ on the surface of the Earth.

What is a circumpolar star?

What is going on inside a star that allows it to shine?

What is the most common element in the Universe? _______________________

What is the second most common element in the Universe? ________________

What single attribute of a star determines its fate in life? ___________________.

What is the brightest nighttime star that you can see with the naked eye? __________.
How far away is it? ________________

What is the closest nighttime star you can see from Saratoga or the Pinnacles? _______.
What constellation is it in? ______________

If you stretch you arm out and hold up your index finger at the sky and close one eye, how much of the sky will your finger cover (angular size)? ____________
What about your closed fist? ______________

What is gamma Leonis? Draw a sketch of the constellation in the space below and indicate where it is.

Which of the 88 constellations is the biggest? _______________________

**Part II. True/False**

Instructions: If the following statement is True then write true in the space following the statement. **If the answer is False, provide a correct explanation.**
The “Big Dipper” is a constellation.

The iron in our hemoglobin comes from stars like the Sun.

High mass stars live longer than low mass stars.

Double stars are necessary for determining the masses of stars.

Four hydrogen nuclei weigh more than a helium nucleus.

Stars that have used up their hydrogen will then use lithium as their fuel.

All the elements on the periodic chart were made during the Big Bang.
The Sun will end its life in a supernova.

PART III.
Write descriptions of the following objects:

Galaxy

Emission Nebula

Planetary Nebula

Globular Star Cluster

Binary Star

The official exam ends here.

Please answer the following questions about the astronomy segment of the course to help me improve the course. Use additional paper if necessary.

What did you like best about the astronomy segment?

What would you like to do more of?

Any other comments that you feel might be useful?