

## Astronomy 10 Midterm Exam

1. Suppose you live at the North Pole. Describe the path of the Sun through your sky for each of the following days:
  - a. the day of the spring equinox
  - b. the day of the summer solstice
  - c. the day of the winter solstice
  
2. On the star map you got indicate the region of the sky which you can never see from the city which name is written at the bottom of the page with the star map.

Coordinates of	Melbourne, Australia	37°48'49" S	144°57'47" E
	New York City, USA	40°43' N	74°0' W
	Helsinki, Finland	60°10'15" N	24°56'15" E
  
3. In the night you see Jupiter near:
  - a. Regulus (constellation Leo)
  - b. Betelgeuse (constellation Orion)(look at your star map – I marked these stars)  
Does it make sense? Why or why not.
  
4. Why don't we see an eclipse at every new and full moon? Describe the conditions needed for a solar or lunar eclipse.
  
5. If two objects are the same size but one object is 5 times hotter than the other object, the hotter object emits
  - a. 500 times more energy
  - b. 625 times more energy
  - c. 125 times more energy
  - d. 20 times more energy
  - e. 25 times more energy
  - f. 5 times more energy
  - g. none of the above
  
6. Decide whether the statement makes sense (or is clearly true) or does not make sense (or is clearly false) and explain your reasoning:  
Galaxies that show redshifts must be red in color.
  
7. What are the two key properties of a telescope, and why is each important?
  
8. List at least three ways in which Earth's atmosphere can hinder astronomical observations, and explain why putting a telescope into space helps in each case. What problem can adaptive optics help with?
  
9. Describe at least two "exceptions to the rules" that we find in our solar system.
  
10. What are the basic differences between the *terrestrial* and *Jovian* planets?  
Which planets fall into each group?

These two questions are more difficult:

11. Draw gibbous and crescent Venus as we see it from USA. Keep the proportions right! (i.e. make them of the same size or make one bigger than other) Explain.
  
12. Through a telescope in Berkeley you see crescent Mars at midnight in the western part of the sky. Does it make sense? Why or why not. In any case, explain *where* should you be to see this?

## **General Remarks:**

- **Please write your name at the top of each page**
- Please write **legible**
- Try to answer as many questions as possible, but please keep in mind that I do not expect that you answer all questions.
- Reasoning matters
- Try to give concise answers, 2-4 sentences.
- If you need to draw a sketch – do it (a picture is worth of thousand words)
- I am interested to know what YOU have learned.