

**I. Written question** (must be answered for paper to be graded).

Three physical science students in three parts of the world (all in northern hemisphere) talk by e-mail about the places they live. In making their comments about the amount of daylight throughout the year, **Celesta** says that where she lives, the amount of daylight and dark shows almost no year-round variation. **Barolo** says that daylight varies a lot where she lives; winters have days with as little as 7 hours of daylight, but during the summer, daylight may extend from 4 am to 9 pm; **Kalcha** says that during winter, whole weeks pass with no sunrise at all, while during the summer, there are weeks when the sun never sets.

In 2-3 sentences, explain what important latitudes (approximately) the three live near; and how you were able to figure that out. Latitudes can be referred to by name or number (you DON'T NEED exact ones). [1.3]

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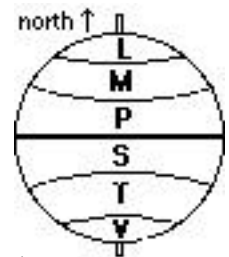
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**II. Short answers.** Place the answer (a single capital letter from those found in each question) on the line at left. Do not circle answers. Note that where there is a list (matching-type questions) that any answer may be used more than once, or not at all. [0.6/question.]

The letters on the diagram at right show regions of the world separated by important astronomical latitudes. Choose a region in this diagram which fits the question.



- \_\_\_\_\_ 1. Never has the sun at the zenith, never has a 24 hour day or night, and spring starts in October (choose diagram letters).
- \_\_\_\_\_ 2. Chicago, at 42°N latitude, is in this region (choose diagram letters).
- \_\_\_\_\_ 3. Two regions which get the sun at the zenith (answers below labeled **A,B,C,D,H, or N**).

**A. L & M   B. M & P   C. P & S   D. S & T   H. T & V   N. none of these**

Choose a time interval which fits the descriptions below.

- \_\_\_\_\_ 4. time interval equal to two crossings of observer's meridian by a star
- \_\_\_\_\_ 5. our normal day
- \_\_\_\_\_ 6. has 365.00 days

**A. sidereal day**  
**B. solar day**  
**C. mean solar day**  
**D. tropical year**  
**N. none of these**

Relate the things described in 7-10 to something in the list at right.

- \_\_\_\_\_ 7. Polaris will not be the north star in 12, 000 years
- \_\_\_\_\_ 8. the existence of perihelion and aphelion
- \_\_\_\_\_ 9. day and night      \_\_\_\_\_ 10. the seasons

**A. rotation**  
**B. revolution and tilt**  
**C. tilt of 23 1/2 °**  
**D. revolution in an elliptical orbit**  
**H. precession**

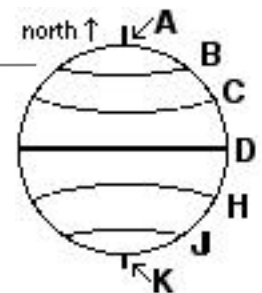
\_\_\_\_\_ 11. How far is it (travelling right on the equator) from the Prime Meridian to the International Date Line?

**A. 7900   B. 25,000   C. 12,500   D. 6250   N. none of these**

\_\_\_\_\_ 12. Which of these is related to rotation, but doesn't really prove it?

**A. Foucault pendulum   B. night and day   C. star trails   D. Coriolis effect**  
**H. two of these don't really prove it   M. all prove it equally**

The letters on the diagram at right show the important astronomical latitudes. Choose a latitude in this diagram which fits the question.



- \_\_\_\_\_ 13. Has a 24 hour night once a year, has winter in July (choose diagram letters).
- \_\_\_\_\_ 14. The sun is at the zenith here on our winter solstice (choose diagram letters).
- \_\_\_\_\_ 15. The sun is at the zenith here twice a year (choose diagram letters).

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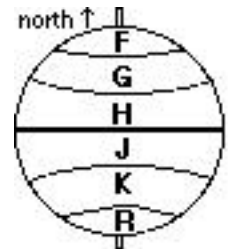
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**L. F & G   M. G & H   P. H & J   S. J & K   T. K & R   XN. none of these**

Choose a time interval which fits the descriptions below.

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K. solar day  
L. mean solar day  
M. tropical year  
X. none of these**

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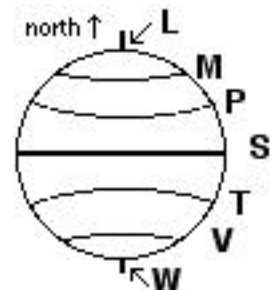
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**THIS WEEK'S PS 111 QUIZ**

**Motions: rotation, revolution,  
precession**

**Proofs of: shape, rotation,  
revolution.**

**Plane of the ecliptic**

**Geocentric latitudes**

**Equinoxes, solstices**

**Variation in daylight around earth**

**Circles and regions; light behavior in  
them**

**Days (sidereal, solar, mean solar)**

**Tropical year; leap years; dst**

**Julian and Gregorian calendars**