Astro 4 Test 1 Practice

Multiple Choice

Choose the ONE best answer and mark it on your answer sheet.

1. Which of the following statements best describes the difference between the apparent DIURNAL and ANNUAL motions that we see in the sky?
   a. There really isn't any difference between the diurnal and the annual motion, since all motions in the sky take 24 hours to complete one cycle.
   b. The diurnal motion means that the sky seems to rotate westward once per day, while the Sun seems to move eastward relative to the stars, maing one eastward circuit per year.
   c. The diurnal motion means that the sky seems to rotate eastward once per day, while the Sun seems to move westward relative to the stars, making one westward circuit per year.
   d. The apparent annual motion of the Sun is much faster than the apparent diurnal motion of the sky. The first only takes 24 hours, while the second one takes a full year.

2. Which of these is the correct OFFICIAL definition of a constellation?
   a. It is a shape that people see and recognize in the sky, such as the `Big Dipper'.
   b. It is a cluster of stars that are all near each other in space.
   c. It is one of 88 regions in the sky with boundaries defined by the International Astronomical Union (IAU).
   d. It is one of about 10 regions in space where we can observe bright stars, which all seem to cluster near each other.

3. A friend of yours from a distant country is visiting you. While going for a walk one night, you point out the North Celestial Pole. They remark that they've never seen either celestial pole high up in their sky before. Which of the following best describes where they live?
   a. On the equator
   b. In the Southern Hemisphere
   c. In a country that's either due East or due West of your country
   d. Near one of the Earth's poles

4. When Galileo observed Venus, he saw something that didn't fit the Ptolemaic model for the Solar System. What was it?
   a. Venus sometimes shows a nearly full phase, and not just a crescent.
   b. Venus sometimes shows a crescent phase, and not just a nearly full phase.
   c. Venus looks brighter at certain times than at others.
   d. Venus shows phases, instead of always looking nearly full at all times.

5. What would the Moon look like two weeks after New Moon?
   a. It would look about one-quarter lit-up.
   b. It would look completely dark.
   c. It would look fully lit-up.
   d. It would look about half lit-up.

6. What was the main purpose of a planet's EPICYCLE in the Ptolemaic model of the Solar System?
   a. It explained why the planets orbit around the Earth.
   b. It explained the relative sizes of the planets' orbits.
   c. It explained why each planet appears to move across the sky with a certain speed.
   d. It explained the occasional retrograde motion of the planets.

7. A friend of yours says that the phases of the Moon are caused by the Earth's shadow on the Moon. Which of the following is the most accurate response?
   a. That's not possible, since the Moon never passes through the Earth's shadow, due to the inclination of the Moon's orbit relative to the Earth's orbit.
   b. You're right, it takes about one month for the shadow to pass across the Moon, causing all of the different phases.
   c. No, because the Moon is too far from the Earth for the Earth's shadow to reach it.
   d. No, they're the result of the angle between our line of sight towards the Moon and the direction from which the Sun is shining on the Moon.

8. Which of these lists has the objects correctly listed in INCREASING order of size?
   a. Earth, Solar System, Galaxy, Universe
   b. Solar System, Earth, Galaxy, Universe
   c. Universe, Solar System, Galaxy, Earth
   d. Universe, Earth, Galaxy, Solar System

9. How many times brighter is star A than star B, if star A is 1 magnitude brighter than B?
   a. 2.512 time brighter
   b. 2 times brighter
   c. 10 times brighter
   d. 100 times brighter

10. You and a friend are looking at the Moon through a telescope. While admiring the craters and plains of lava on the Earth-facing side of the Moon, your friend claims to have looked at the other side of the Moon through their telescope last week. Which of the following is the most accurate response to your friend?
    a. I don't see how you could have seen the other side of the Moon, since it's so far away.
    b. Yes, I saw that too, it's great that we can see the two sides on alternating weeks.
    c. That's impossible, because the Moon rotates much more quickly than its period of revolution around the Earth.
    d. That's impossible, because the Moon rotates once in the same time it takes to go around the Earth once.

11. When Galileo observed the Moon through a telescope, what did he see that didn't fit with the Aristotelian view of the universe?
    a. The Moon has light and dark patches on its surface.
    b. The Moon appears to have a spherical shape.
    c. The Moon has mountains, plains, and valleys, much like the `imperfect' Earth.
    d. The Moon is completely smooth, confirming that everything above the Earth is perfect.

12. You and a friend are watching a solar eclipse. Your friend suggests there will be another solar eclipse in about a month, when the Moon has completed one more orbit. Which of the following is the most accurate response?
    a. That's not likely, because the Sun will be in a different place in the sky in about a month.
    b. Probably not, because it takes the Moon much more than a month to go around the Earth.
    c. That's correct, because it takes the Moon about one month to orbit the Earth.
    d. Probably not, because the Moon will probably pass a bit above or below the Sun (as seen in the sky) a month from now.

13. When we look at the sky with the unaided eye, what looks different about the planets, as compared to the stars?
    a. The planets seem to move relative to the stars.
    b. The planets cannot be seen with the unaided eye, because they're too far away.
    c. The planets never move relative to each other.
    d. The planets are all much brighter-looking than the stars.

14. A friend of yours says `there will be a solar eclipse tomorrow, since tomorrow is Full Moon'. Which of the following is the most accurate response?
    a. You're right, since solar eclipses occur when the Earth is between the Sun and the Moon.
    b. That's wrong, since solar eclipses can only occur at New Moon.
    c. That's right, since the Moon will give us plenty of light to see the eclipse tomorrow night.
    d. That's wrong, since eclipses only occur when the Moon is on the ecliptic.

15. Which of the following is the REAL cause of the seasons?
    a. Different hemispheres of the Earth are tilted towards (or away from) the Sun at different points in the Earth's orbit.
    b. The Sun's orbit around the Earth changes throughout the year.
    c. The Earth is closer to the Sun at some times of year, and farther from the Sun at other times of the year.
    d. The brightness of the Sun changes throughout the year.

16. What feature of planetary motion could the Copernican model of the Solar System explain more simply than the Ptolemaic model could?
    a. Eclipses
    b. Retrograde motion
    c. Annual motion
    d. Diurnal motion

17. Which of the following apparent sky motions is caused by the ROTATION of the Earth?
    a. The Moon appears to move around the sky in about one month.
    b. Mars appears to move in a `retrograde' direction about once every year and a half.
    c. The sky seems to rotate westward once per day.
    d. The Sun seems to move around the sky once per year.

18. Which of the following best describes an ancient view of the universe that was popular in many parts of the world for nearly 2,000 years?
    a. The Earth is a sphere that orbits around the Sun.
    b. The `sphere' of the stars is an illusion created by the fact that they are all so far away.
    c. The stars are scattered throughout space, and the Sun is a star just like them.
    d. The Earth is a sphere, located at the center of a spherical `shell' of stars.

19. How could a person in ancient times have proven that the stars are farther away than the Moon?
    a. The Moon sometimes passes in front of stars, covering them up.
    b. The apparent sizes of the stars are much smaller than the Moon.
    c. Some of the bright stars occasionally appear to pass in front of the Moon.
    d. The Moon can sometimes be seen during the day, which proves that it must be much closer than the stars.

20. Many people mistakenly believe that the world will end in 2012. Which of the following is a true fact that has been misinterpreted as part of the 2012 hoax?
    a. All of the planets will be on the same side of the Sun on Dec. 12, 2012.
    b. The Earth, Sun, and Jupiter will all be lined up at that time.
    c. The Earth's tectonic plates will all align with the Sun on Dec. 12, 2012.
    d. The Earth, Sun, and the center of the Milky Way galaxy will line up then.

21. What's the center of the Solar System in the Aristotelian / Ptolemaic model?
    a. The Earth
    b. The Sun
    c. The Moon
    d. The sphere of the `fixed stars'

22. Which distance is bigger - an astronomical unit (AU) or a light-year (LY)?
    a. An astronomical unit (AU)
    b. Neither one is a measurement of distance.
    c. They're both about the same distance.
    d. A light-year (LY)

Short Answer

23. Make a well-labeled drawing (or series of drawings) that show what the two `Quarter Moons' look like. Make sure that your drawing(s) explain the following things:

    1) What the Moon looks like to an Earth-bound observer at First Quarter and Third Quarter, and why it takes on these appearances.
    2) How much time goes by between the First and Third Quarters.

    You'll want to show WHAT the Moon looks like at these times, but make sure to also explain WHY it looks the way that it does at these two times.

Astro 4 Test 1 Practice
Answer Section

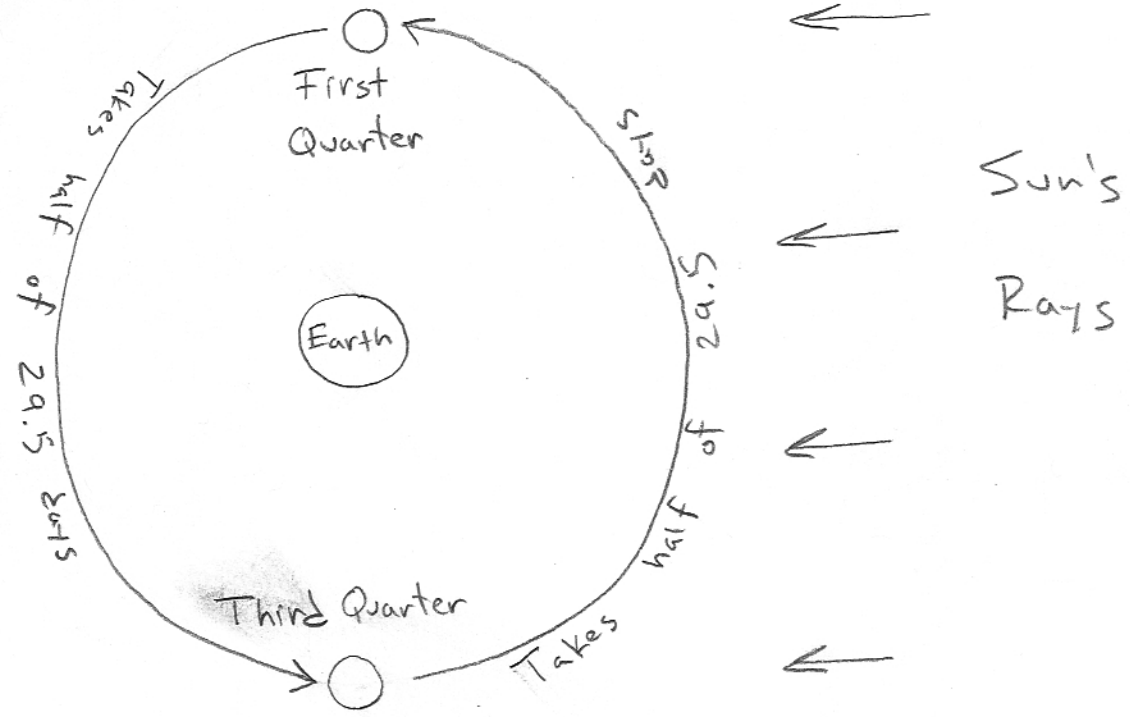
MULTIPLE CHOICE

1. ANS: B
2. ANS: C
3. ANS: A
4. ANS: A
5. ANS: C
6. ANS: D
7. ANS: D
8. ANS: A
9. ANS: A
10. ANS: D
11. ANS: C
12. ANS: D
13. ANS: A
14. ANS: B
15. ANS: A
16. ANS: B
17. ANS: C
18. ANS: D
19. ANS: A
20. ANS: D
21. ANS: A
22. ANS: ~~A~~ D

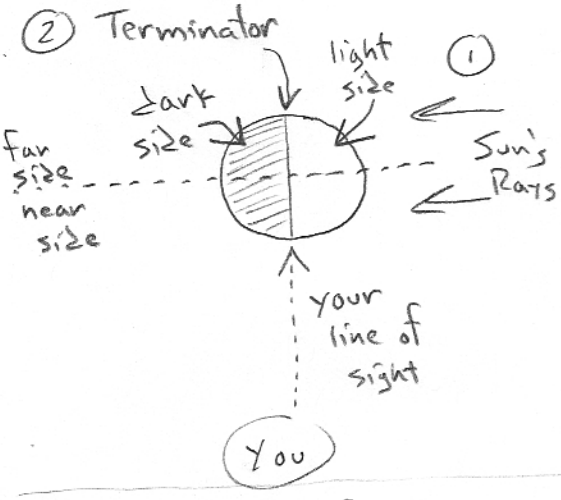
SHORT ANSWER

23. ANS:
    Answers will vary from student to student.

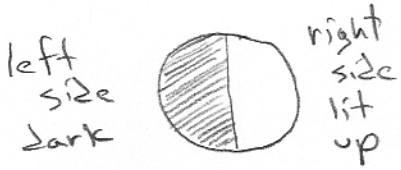
Moon's orbit, as seen from <u>above</u> (i.e. looking <u>down</u> on the north poles of the Earth and Moon):



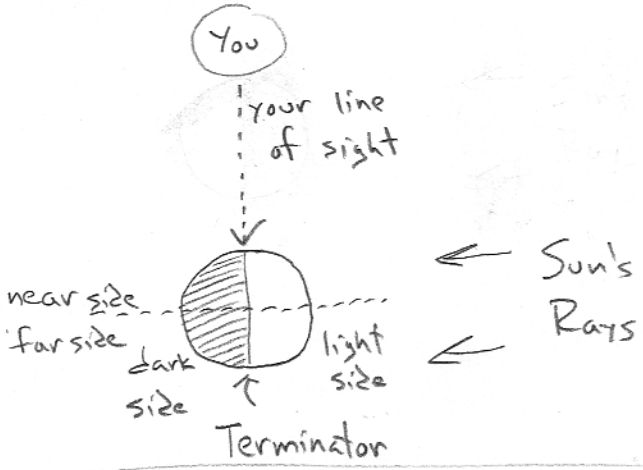
Closeup of First Qtr: (from above)



How it looks from your point of view on Earth:



Closeup of Third Qtr: (from above)



How it looks from your point of view on Earth: