

ASTR 1504/1514: Astronomy: Exploring the Universe Midterm Exam 1

1. Is there any location on Earth where the entire sky is potentially visible within a 24 hour period (ignoring the fact that most stars can't be seen if it is daytime)?
 - A: There is no position on the Earth where it is possible to see the entire sky in one daily rotation of the Earth.
 - B: At a latitude of either 45 degrees North or South.
 - C: At the equator
 - D: At either the north or south pole

2. A crucial component of a scientific theory is that it is able to be tested by observations and thus proven true or false.
 - A: True
 - B: False

3. Constellations are arbitrary groupings of stars in the sky.
 - A: True
 - B: False

4. The seasons on Earth are caused by the change in distance between the Sun and Earth.
 - A: True
 - B: False

5. The ecliptic plane is defined by the motion of which object in the sky.
 - A: the Moon
 - B: the Sun
 - C: Polaris
 - D: the stars

6. If you go out at exactly 9 P.M. each evening over the course of one month, the position of a given star will move westward by tens of degrees. What causes this motion?
 - A: The Earth's rotation on its axis
 - B: The revolution of the Earth around the Sun
 - C: The revolution of the Moon around the Earth
 - D: The revolution of the Sun around the Earth

7. The Moon undergoes synchronous rotation, and as a consequence the:
- A: rotational period of the Moon equals the orbital period of the Moon around the Earth
 - B: rotational period of the Moon equals the rotational period of the Earth
 - C: rotational period of the Moon equals the orbital period of the Earth around the Sun
 - D: Moon does not rotate as it orbits the Earth
8. If tonight the Moon is in the waxing gibbous phase, in three days the Moon will most likely be in the:
- A: new phase
 - B: full phase
 - C: third quarter phase
 - D: first quarter phase
9. During which lunar phase do solar eclipses occur?
- A: New
 - B: First quarter
 - C: Full
 - D: Third quarter
10. When the Earth catches up to a slower moving outer planet and passes it in its orbit like a faster runner overtakes a slower runner in an outside lane, the planet:
- A: exhibits retrograde motion
 - B: slows down because it feels the Earth's gravitational pull
 - C: decreases in brightness as it passes through the Earth's shadow
 - D: moves into a more elliptical orbit
11. If the Sun is located at one focus of Earth's elliptical orbit, what is at the other focus?
- A: Earth
 - B: The Moon
 - C: Nothing
 - D: This is a trick question. An ellipse has only one focus.

12. Which of the following is TRUE about a comet that is on an elliptical orbit around the Sun?
- A: The comets speed is greatest when it is farthest from the Sun.
 - B: The comets speed is greatest when it is nearest the Sun.
 - C: This comets speed is zero.
 - D: The comets speed is constant because its mass and the Suns mass stay approximately the same.
13. What force holds planets in their orbits?
- A: Air resistance
 - B: Friction
 - C: Electromagnetic
 - D: Gravity
14. In which of the following situations would the object be experiencing an unbalanced force?
- A: A truck at rest
 - B: An car moving at constant speed turning a corner
 - C: A rocket moving at a constant speed straight up away from the Earth
 - D: A car moving at a constant speed towards the right
15. Once two objects are far enough away from each other, they no longer exert any gravitational attraction on each other.
- A: True
 - B: False
16. A radio photon travels more slowly than a gamma ray photon in vacuum.
- A: True
 - B: False
17. The energy of a photon is inversely proportional to its wavelength.
- A: True
 - B: False