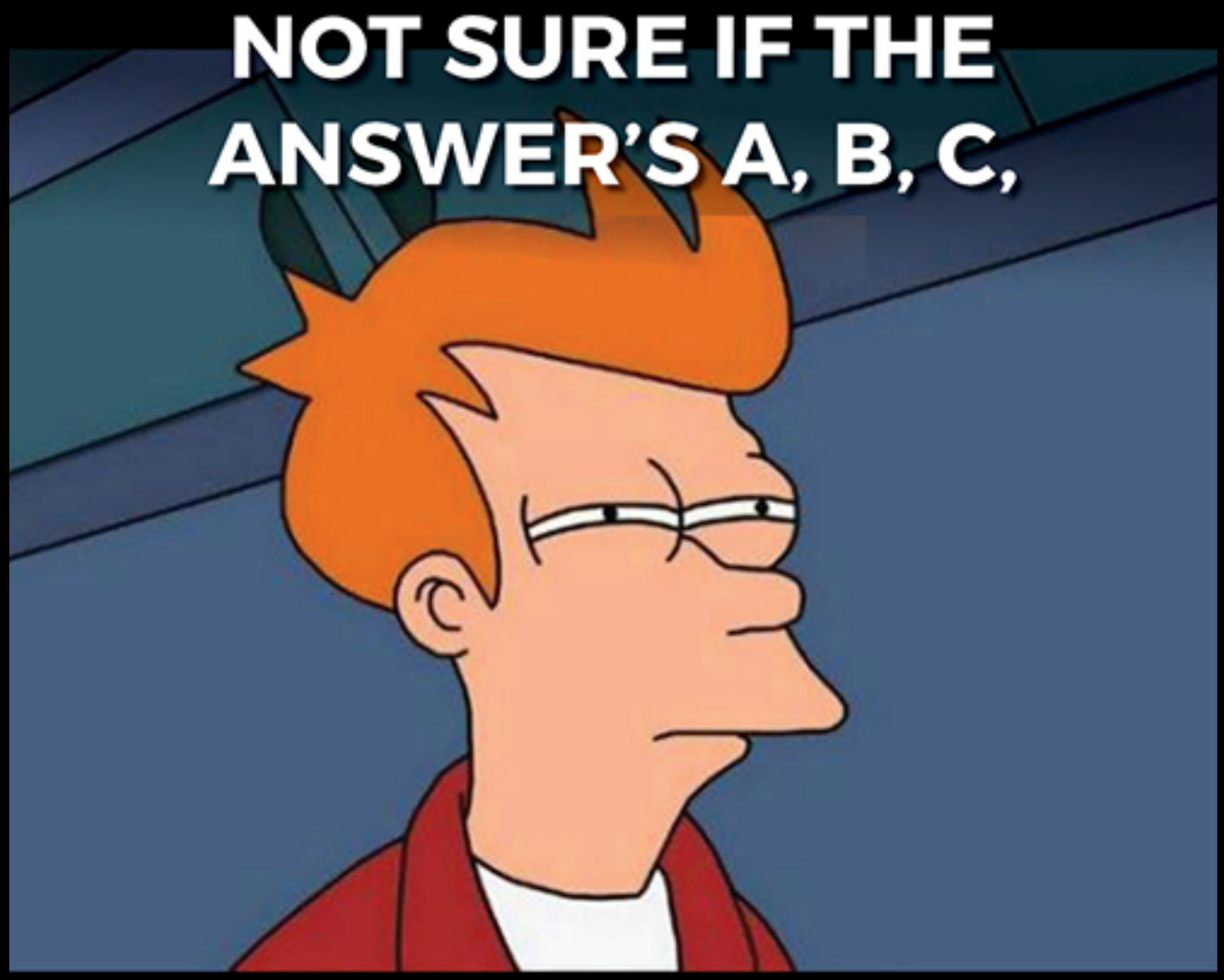

NOT SURE IF THE
ANSWER'S A, B, C,
OR ALL OF THE ABOVE

1. All photons travel with the same _____.

A. Speed
B. Wavelength
C. Frequency
D. Direction

2. What do we call the day(s) of the year when the Sun rises directly in the East and sets directly in the West?

A. Solstices
B. Circumpolar
C. Equinoxes
D. Celestial

3. Which moon phase is this?

A. Waxing gibbous
B. Waxing crescent
C. Waning gibbous
D. Waning crescent
E. None of the above

4. What can we learn by analyzing a star's light (spectrum?)

A. Its temperature
B. Its composition
C. Its speed through space
D. All of the above

5. Which is a reason why we have seasons on Earth?

A. Because the moon's gravity pulls on our oceans
B. We have longer daylight hours in Winter
C. Our orbital distance from the Sun varies throughout the year
D. The Earth's tilted axis causes us to receive more direct sunlight in Summer
E. The Earth's tilted axis puts us closer to the Sun in summer and farther in Winter

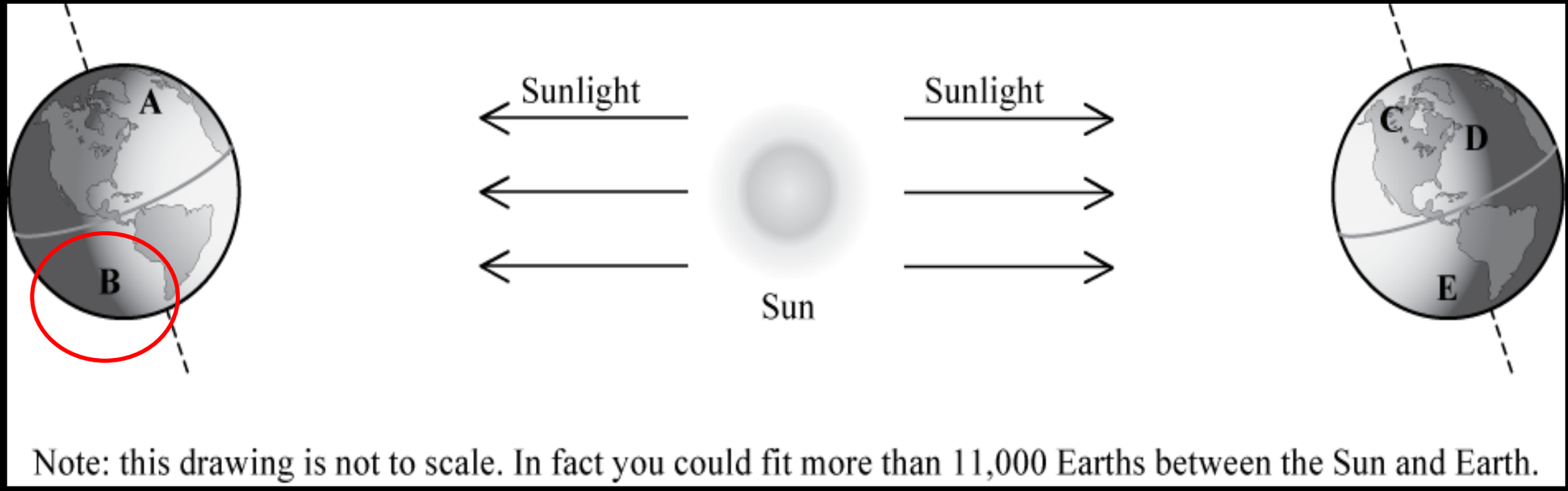
6. Which type of telescope uses two glass lenses to collect and focus light?

A. reflector
B. refractor
C. mirrored
D. satellite

7. What is the main reason for tides in Earth's oceans?

A. The Sun's gravity is stronger on one side of the Earth than the other
B. The moon's gravity is stronger on one side of the Earth than the other
C. The moon goes through phases
D. Cyclical winds blow the water from one side of Earth to the other

8. Which one lettered position (A-E) in the image below best represents the location on Earth that is experiencing summer in the Southern Hemisphere?




Note: this drawing is not to scale. In fact you could fit more than 11,000 Earths between the Sun and Earth.

9. The AREA under the blackbody curve tells us what about a star?

A. Composition
B. Energy
C. Temperature
D. Rotation

10. When a star is moving toward you, its light would _____.

A. Appear red
B. Appear blue
C. Be redshifted
D. Be blueshifted

11. Which of the following is always true about electromagnetic radiation?

A. It cannot easily pass through Earth's atmosphere
B. It is not visible to the human eye
C. It travels at the speed of light
D. More than one answer above is correct
E. None of the answers above are correct

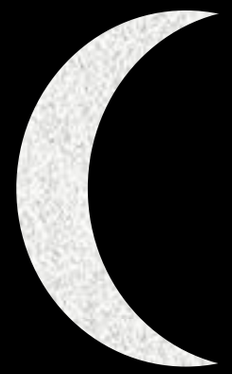
12. When an atom absorbs light, which of the following occurs?

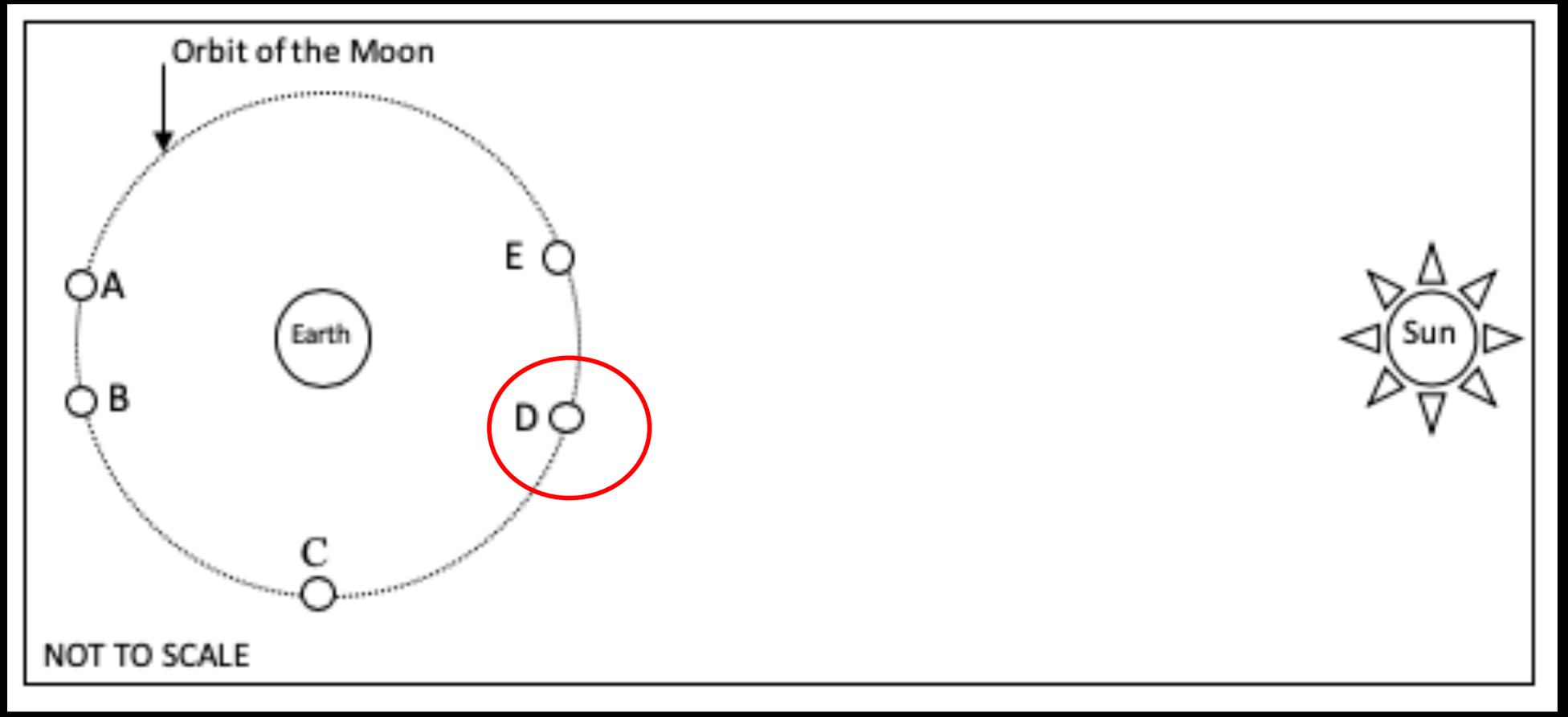
A. An electron goes from a high energy level to a low energy level.
B. An electron goes from a low energy level to a high energy level.
C. A photon goes from a high energy level to a low energy level.
D. A photon goes from a low energy level to a high energy level.

13. Some telescopes are placed in space above Earth's atmosphere primarily for which of the following reasons?

A. Because the astmosphere magnifies objects making them look larger than they actually are.
B. Some of the light being sent out from the telescopes can be blocked by Earth's atmosphere.
C. Moving the telescope above the atmosphere puts the telescope closer making the objects appear brighter.
D. Some of the light from objects is absorbed by Earth's atmosphere.

14. The diagram below shows Earth and the Sun as well as five different possible positions for the Moon. Which position of the Moon best corresponds with the phase of the Moon shown in the figure at the right?





15. Which of the following is the type of spectrum you would observe if you could receive the light from the Sun before it passes through the Earth's atmosphere?

A. Dark line absorption spectrum
B. Bright line emission spectrum
C. Continuous spectrum
D. None of the above

16. Which of the following is true about solar eclipses?

A. You cannot see them from the north or south pole.

B. The moon turns totally black.

C. They are visible every month from some location on Earth.

D. The moon blocks our view of the Sun.

17. Which of the following is true about mathematicians' prediction of the existence of Neptune?

A. Irregularities in Uranus's motion suggested another body further out in the solar system

B. Pluto's eccentric orbit required another planet inward of it

C. Astrologers needed an eight planet for the horoscopes to work

D. Previous observations of a faint moving object hinted at its existence

18. Which of the following has the shortest wavelength?

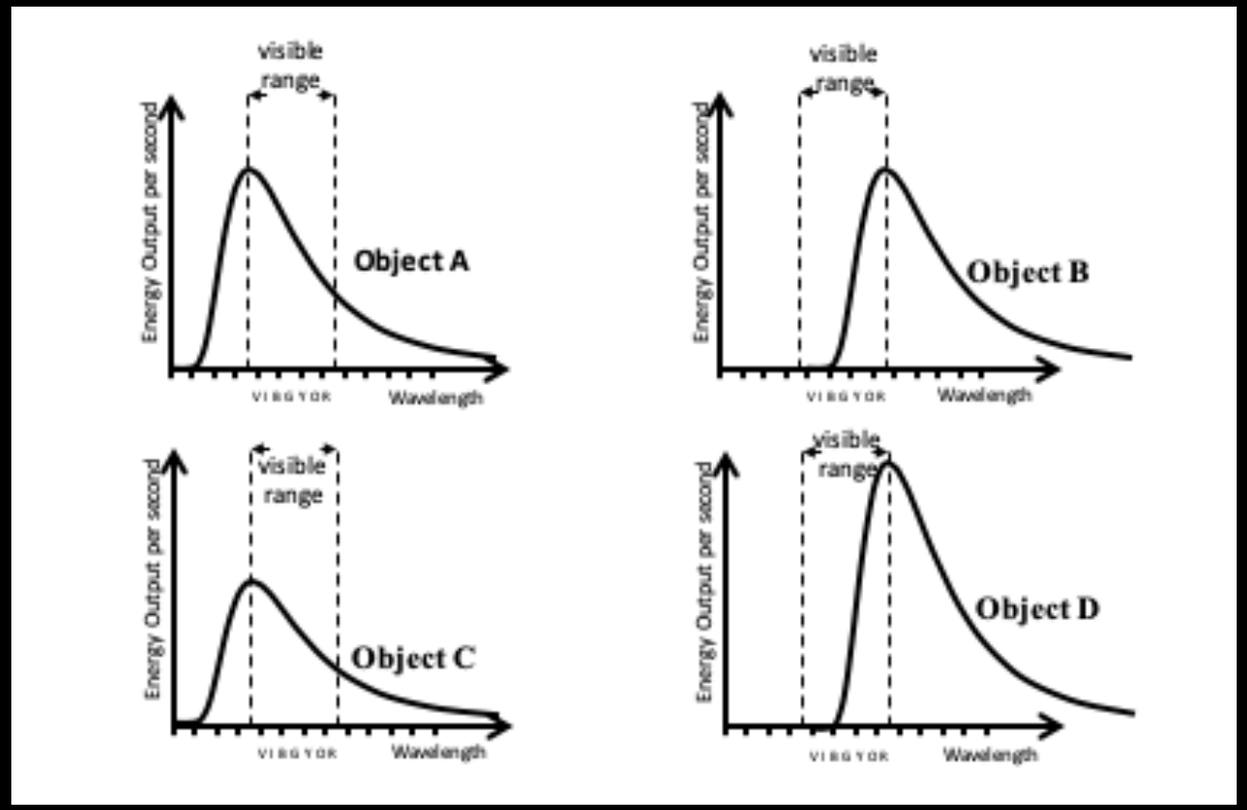
A. Infrared radiation

B. X-rays

C. A gamma-ray photon

D. Microwaves

E. Ultraviolet light




19. Which of the objects emits light that has peak emission with the longer wavelengths? (A,B,C,D,B&D)

20. Which, if any, of the other objects has the same temperature as object B? (A,C,D, all same, not enough info)

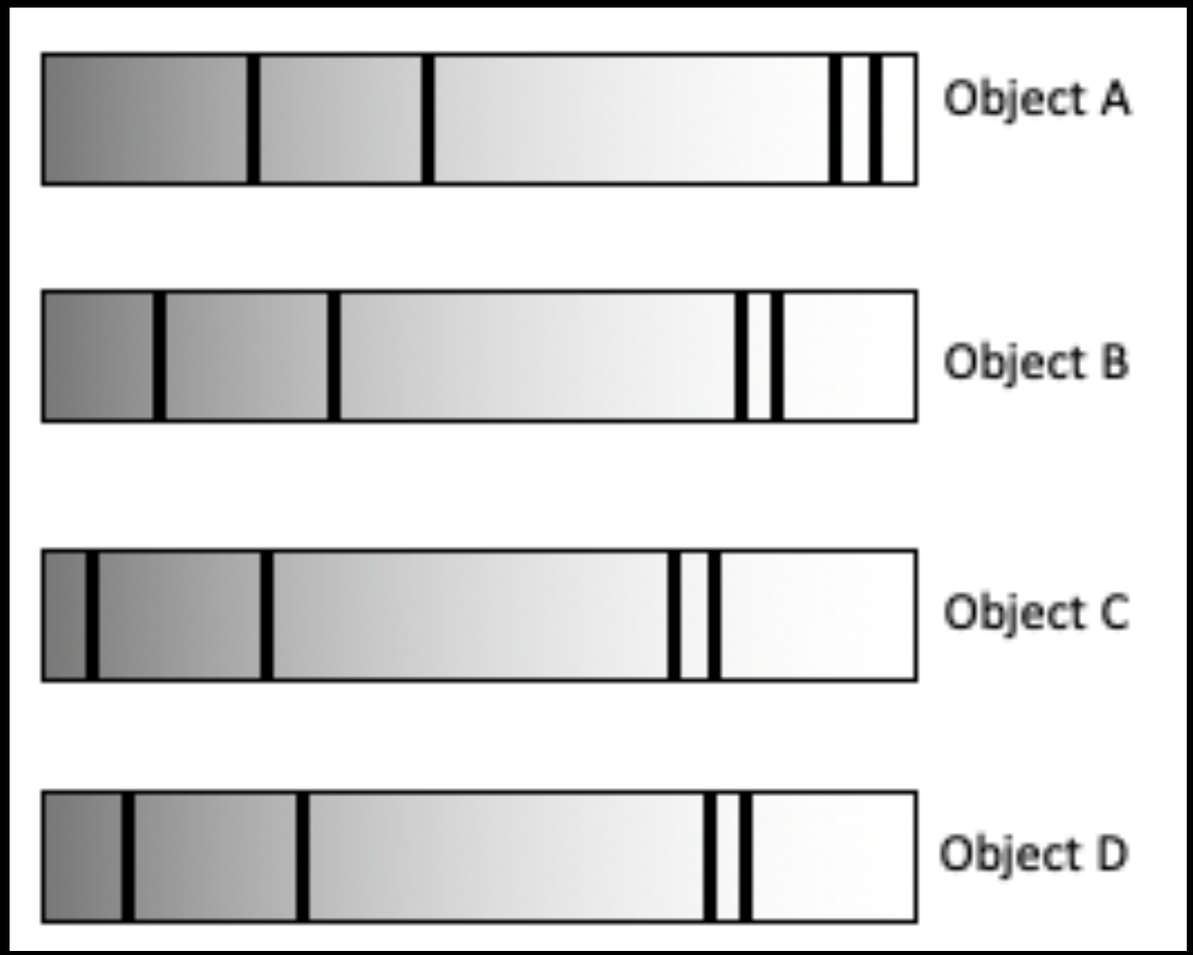
21. Which object has the largest luminosity? (A,B,C,D, all same)

22. If the Earth were upright with no tilt, would the temperature at your location in June be colder, warmer, or the same as it currently is?

A. Colder

B. Warmer

C. The same




23. Which object would be at rest?
(A,B,C,D, all same)

24. Of the objects that are moving, which is moving with the fastest speed?
(A,B,C,D,all same)

25. Which one of the following is a reason why we see Moon phases?

A. Earth’s shadow on the Moon

B. The Sun’s shadow on the moon

C. The Moon’s orbit around Earth

D. Earth’s orbit around the Sun

26.If you launch a rocket at greater than Earth's escape speed, then it will:

A. Eventually fall back down to the ground

B. End up in a closed orbit circling Earth

C. Go into an open orbit, never to return to Earth

D. None of the above

27.Energy is released from atoms in the form of light when electrons

A. Move from high energy levels to low energy levels

B. Move in their orbit around the nucleus

C. Move from low energy levels to high energy levels

D. Are absorbed by atoms

28.An astronaut is floating inside a spacecraft orbiting Earth. He or she feels weightless because:

A. There is no gravity in space to pull on the astronaut

B. The astronaut and the spacecraft are accelerating (falling) at the same rate

C. The astronaut and the spacecraft have the same velocity

D. The astronaut is being buoyed by anti-gravity forces

E. They happen when the Earth goes between the Sun and Moon.

29. An important line in the absorption spectrum of stars occurs at a wavelength of 656nm for stars at rest. Imagine that you observe four stars (A-E) from Earth and discover that this absorption line is at the wavelength shown in the table below for each of the four stars.

| 1. STAR | 2. Wavelength of Absorption line |
|---|---|
| A | 649 nm |
| B | 656 nm |
| C | 658 nm |
| D | 647 nm |

Which of the following is the most accurate ranking of the speed of the stars from moving fastest toward Earth to moving fastest away ?

A. A=B=C=D
B. C, B, A, D
C. D, A, B, C
D. Cannot be determined from the information provided.

30. Which of the following describes one reason that the northern and southern hemispheres have different seasons at different times?

A. The Earth is closer to the Sun during summer in the southern hemisphere and is farther from the sun during the winter in the northern hemisphere.

B. During the time of year when the Sun is high in the sky in the northern hemisphere it will be low in the sky in the southern hemisphere.

C. The Earth is tilted, so the Sun is closer to one hemisphere than the other, which causes one hemisphere to be in winter and the other in summer.

D. The amount of energy given off by the Sun changes throughout the year and provides more energy to one hemisphere than the other

E. The amount Earth is tilted changes over the course of the year and causes the amount of sunlight that reaches each hemisphere to be different which causes the seasons to be opposites.

31. Which of the following moves the slowest?

A. radio waves

B. visible light

C. x-rays

D. infrared light

E. They all move at the same speed.

32.How often does the “New Moon” phase occur?

A. every day/ night

B. once a week

C. once every two weeks

D. once a month

E. once a year

33. An electron that makes a bigger jump will emit a photon that is _____.

A. Travelling faster

B. Travelling slower

C. More blue

D. More red

34. A bright star is moving toward Earth. If you were to look at the spectrum of this star, what would it look like?

A. An absorption spectrum that is redshifted relative to an unmoving star

B. An emission spectrum that is redshifted relative to an unmoving star

C. A continuous spectrum that is blueshifted relative to an unmoving star

D. An absorption spectrum that is blueshifted relative to an unmoving star

E. A continuous spectrum that is redshifted relative to an unmoving star

35. Imagine that Earth moved 1 million miles closer to the Sun during its orbit than it currently does, and 6 months later it moved 1 million miles further away than it currently does. How would this affect the seasons?

A. We would no longer experience a difference between the seasons.

B. We would continue to experience seasons in essentially the same way we do now.

C. We would still experience seasons, but the difference would be much more noticeable.

D. We would still experience seasons, but the difference would be much less noticeable.

36. The most important function of a telescope is

A. to be able to see far away dim objects.

B. to see fine detail in nearby objects like the moon.

C. to magnify objects like Jupiter.

D. more than one of the above.

37. What happens once per month when the moon goes between the Earth and Sun?

A. New moon

B. Lunar eclipse

C. Full moon

D. Solar eclipse

38. If you want to see an object that produces an emission spectrum, where should you look?

A. Up in the sky at clouds

B. At a store's neon open sign

C. At the person sitting next to you

D. None of the above is correct.

E. Two or more of the above are correct.

39. Light with a high energy has a _____ frequency and a _____ wavelength

A. high; short

B. high; long

C. low; short

D. low; long

40. Your friend didn't come to the party you were having during the weekend. When you confront him about it, he apologizes, saying that he had the rare chance to visit the new gamma ray telescope in town. Could he be telling the truth?

A. Yes

B. No, gamma ray telescopes must be on mountains

C. No, gamma ray telescopes must be above Earth's atmosphere

D. No, the technology for a gamma ray telescope doesn't exist yet

41.Approximately how long does it take for the Moon to go from a waning gibbous to the third quarter phase?

A. 1 week

B. 3 hours

C. 4 days

D. 5 months

42. The Sun makes a complete circle in the sky once every 24 hours—a length of time called the solar day. The stars make complete circles in the sky once per sidereal day. Which of the following is true about the sidereal day?

A. It is shorter than the solar day.

B. It is the same as the solar day.

C. It is longer than the solar day.

D. Its length depends on the time of year.