

DATE:

NAME:

CLASS:

UNIT 5

BLM 5-21

ASSESSMENT

Unit 5 Test

Goal • Demonstrate your understanding of the concepts presented in Unit 5.

What to Do

Read each question carefully before answering in the space provided.

Definitions

Define each term in full sentences.

1. heliocentric

Model of the Universe where the Sun is at the center. All other planets revolve around it.

2. spectroscope

a device that produces a focussed spectrum of a light source.

3. red shift

When the lines in a spectrum of a celestial body appear shifted to the red end of the spectrum indicating it is moving away from Earth.

4. payload

The package that a rocket delivers (bomb, instruments, probe etc.)

5. cosmonaut

Russian term for astronaut.

True or False

In the space provided, indicate whether each statement is true (T) or false (F).

F

6. Planets follow circular orbits around the Sun.

T

7. The angle above the horizon of a star is its altitude.

F

8. The Sun's light exhibits an emission spectrum.

F

9. An astronomical unit (AU) is the distance light travels in one year.

T

10. A satellite that orbits Earth in about 1.5 h is in a low Earth orbit.

F

11. The terrestrial planets have similar conditions on their surfaces.

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Unit 5 Test (continued)

Multiple Choice

Circle the best answer.

12. An astronaut is tethered to the *International Space Station*, keeping a constant distance from the station. The false statement here is
- (a) The station's velocity relative to the astronaut is zero.
 - (b) The astronaut's velocity relative to the station is zero.
 - (c) The velocities of the station and the astronaut relative to Earth are different.
 - (d) The velocities of the station and the astronaut relative to Earth are the same.
13. The correct statement about a scientist and what he discovered is:
- (a) Galileo, spectroscope
 - (b) Kepler, radio telescope
 - (c) Newton, law of gravity
 - (d) Ptolemy, elliptical orbits

Use the information to answer the following question

Spectral Types I – continuous
 II – emission
 III – absorption

14. The Sun is a huge sphere of gases at tremendously high pressure with an atmosphere of cooler gases at low pressure around it. The Sun's spectrum should be of type
- (a) I only
 - (b) III only
 - (c) I and II only
 - (d) II and III only
15. Satellite dishes are becoming more popular with people interested in watching many TV channels. The satellites that these dishes are aimed at are in:
- (a) geosynchronous orbits so that the satellite dish need not be moved
 - (b) low Earth orbits so the signals reach the customers in a fraction of a second
 - (c) low Earth orbits so the signals don't have to be very powerful, thus saving money
 - (d) geosynchronous orbits so that the satellites can't be harmed from Earth

Fill in the Blanks

Complete each sentence with the correct term.

16. When measuring the position of the Moon in the sky we can use altitude - azimuth coordinates. The angle clockwise from north is the azimuth and the altitude is the angle above the horizon.
17. Reflecting telescopes have mirrors for objectives. The magnification of a telescope is found by dividing the objective's focal length by the eyepiece's focal length.
18. If a star is approaching us, its light will be blue shifted. This is due to the doppler effect.

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19. When triangulating to find the distance of an object that is far away, a long baseline is preferred in order to increase the precision of the measurement.
20. Radio waves have an advantage over visible light for astronomy in that they can penetrate clouds and dust.
21. A rocket consists of a payload, Fuel tanks and a motor.
22. The weightless conditions that astronauts feel when in orbit is called micro-gravity. It is caused by free-falling.
23. Earth's natural satellite is the Moon. The planet with the hottest surface temperature is Venus. Jupiter is the biggest planet, and the farthest planet yet reached by a spacecraft from Earth is Neptune.

Short Answers

24. Explain how the rising and setting of the Sun and Moon are explained in a geocentric and heliocentric model of the universe.
- (a) geocentric The Sun & Moon revolve around a fixed Earth, from east to west.
- (b) heliocentric Earth's rotation from west to east makes it seem that the Sun and Moon rise in the east and set in the west.
25. What did astronomers conclude from the observation that the light from almost all the galaxies is red shifted?
All the galaxies are moving away from us. This is consistent with an expanding universe.
26. Why do astronomers want to make bigger and bigger telescopes? Give two reasons.
Bigger telescopes gather more light so we can image fainter objects. They also have better resolving power so we can see finer detail.
27. Give three ways that people are using the Global Positioning System.
Used for Fishing (Ocean travel)
Car navigation
Geology to mark topography
28. Why did astronomers want a telescope in space when they can build bigger ones on Earth?
A space telescope can image electromagnetic radiation that doesn't reach Earth's surface, e.g. infrared, X-rays etc.

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29. Why do Canadian astronauts have to be experts in some scientific field?

Canadian astronauts are usually mission specialists.

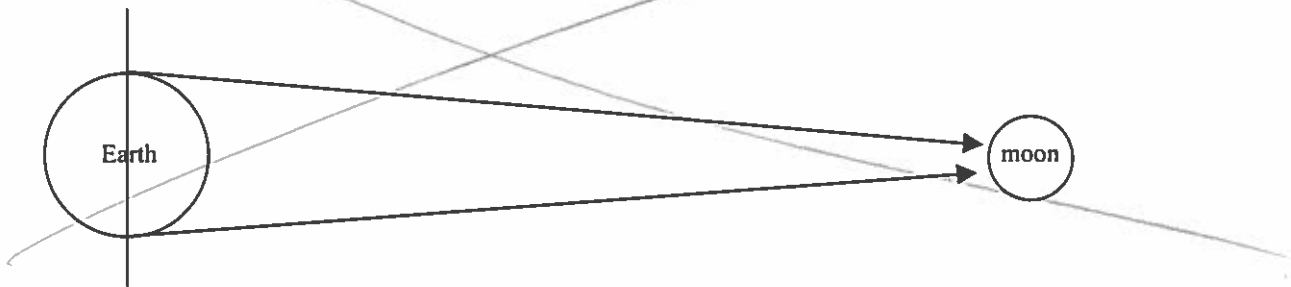
Long Answers

Answer the following questions in full sentences.

30. How did the advances in early technology lead to the change in our view of the universe from a geocentric to a heliocentric point of view?

Both views of the universe explain the movements of the celestial bodies to a crude approximation. Precise measurements of positions, however, forced the two models to account for the motions with more accuracy and the heliocentric view won out. The advances of technology referred to here allowed more precise measurement of those bodies.

31. If two groups of students triangulated the distance to the moon from locations on the opposite side of the world (see diagram), what angles would they expect to measure? (NOTE: The Moon is 30 Earth diameters from Earth.)



Use the spectra here to answer the next question.

		hydrogen	
blue end		mercury	red end
		star X	
		Star Y	

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32. Explain what the spectra of stars X and Y tell us about these stars.

Star X contains hydrogen: the lines are red shifted
so it's moving away.

Star Y contains hydrogen: mercury with no shift so it is
not moving away ^{from} or towards us.

33. Astronauts must do ordinary things differently in a microgravity environment than they would on Earth. Describe how one ordinary thing is done when in orbit.

Sleeping, There is no up: down or weight, so
astronauts must have sleeping restraints.

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34. There are many things to consider in order to maintain life support for a group of astronauts in space. Describe three of these and explain how to keep the astronauts alive over a time period of three months.

Air: The spacecraft must carry breathable air, eliminating wastes and replenishing oxygen.

Water: It must be recycled or produced.

Radiation: There is no natural protection from the solar wind, the spacecraft must block the radiation.