

Science 9 Space Unit Exam



Name: _____

Date: _____

Section A: Multiple Choice – Please continue to fill in the scantron.

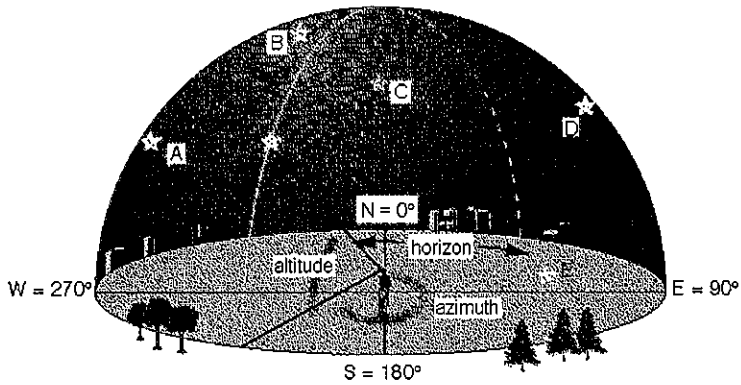
1. When calculating the location of a celestial object in the sky, you require two values: azimuth and altitude.

Which of the following answers refers to azimuth?

- a. 254°
- b. 90° down
- c. 270° above the horizon
- d. 90° above the horizon

2. Which of the following models, used to explain the movement of celestial bodies, involved a rotating, revolving Earth?

- a. Earth-centred
- b. Geocentric
- c. Firmament of fixed stars
- d. Heliocentric

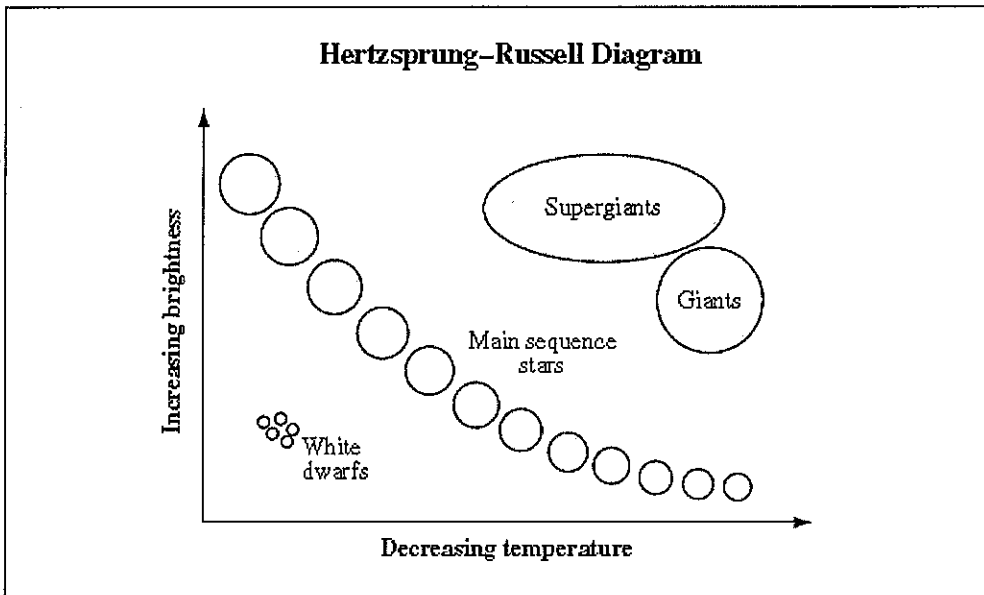


3.

In the diagram above, point B is in the west and approximately _____° above the horizon

- A. 90°
- B. 45°
- C. 80°
- D. 25°

Use the following information for the question below.



4. When compared with a giant star, a white dwarf star is

- A. brighter and hotter
- B. brighter and colder
- C. dimmer and hotter
- D. dimmer and colder

5. Parallax and triangulation can be used to determine the

- A. distance between a star and a planet
- B. magnitude of a star's brightness
- C. speed a planet is orbiting a star
- D. composition of a star or planet

6. Which of the following technologies provides the **least** information about celestial bodies in our solar system?

- A. Telescope
- B. Interferometry
- C. Spectral analysis
- D. Global Positioning System

7. A *i* consists of stars, planets, and dust, which are formed from a *ii* .

The statement above is completed by the information in row

Row	<i>i</i>	<i>ii</i>
A.	constellation	nebula
B.	nebula	galaxy
C.	galaxy	nebula
D.	galaxy	constellation

8. The chart that contrasts the geocentric model of the solar system with the current heliocentric model is

A.

Geocentric Model	Current Heliocentric Model
* Planets orbit the Sun	* Planets orbit Earth
* Orbits are circular in shape	* Orbits are elliptical in shape

B.

Geocentric Model	Current Heliocentric Model
* Planets orbit the Sun	* Planets orbit Earth
* Orbits are elliptical in shape	* Orbits are circular in shape

C.

Geocentric Model	Current Heliocentric Model
* Planets orbit Earth	* Planets orbit the Sun
* Orbits are circular in shape	* Orbits are elliptical in shape

D.

Geocentric Model	Current Heliocentric Model
* Planets orbit Earth	* Planets orbit the Sun
* Orbits are elliptical in shape	* Orbits are circular in shape

Use the following information to answer question number 9.

The year 2020 is the target date for the creation of a base on the Moon.



Speaker I

How much will establishing this base on the moon cost?

If nuclear reactors are used for power, then how will the waste be disposed of?



Speaker II

Who gets to determine how the resources on the moon are to be used and distributed?



Speaker III

How can we ensure that the moon base is used for peaceful initiatives?



Speaker IV

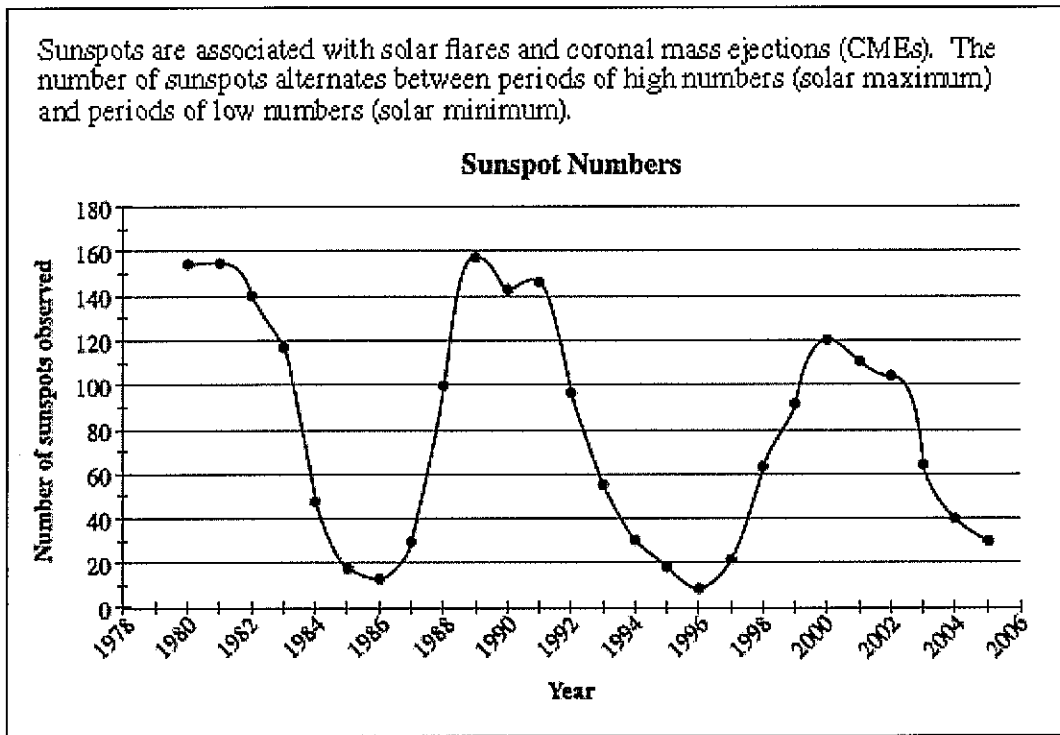
9. Which speaker's question reflects an environmental perspective?

- A. Speaker I
- B. Speaker II
- C. Speaker III
- D. Speaker IV

10. What rule should you follow to calculate azimuth co-ordinates?

- a. Measure the angle counter clockwise from the north.
- b. Measure the angle clockwise from the north.
- c. Measure the angle counter clockwise from the south.
- d. Measure the angle clockwise from the south.

Use the following chart to answer question number 11.



11.

—Data obtained from the *National Geophysical Data Center*

In the year 2011, there will most likely be *i* in CMEs associated with a solar *ii* .

The statement above is completed by the information in row

Row	<i>i</i>	<i>ii</i>
<input checked="" type="radio"/> A.	an increase	maximum
B.	an increase	minimum
C.	a decrease	maximum
D.	a decrease	minimum

12. What are three parts that all rockets have?

- a. Combustible material, tube, and explosive
- b. Explosive, payload, and measuring device
- c. Measuring device, payload, and tube
- d. Tube, combustible material, and payload

13. The band of colours produced when a ray of light passes through a crystal window is known as which of the following?

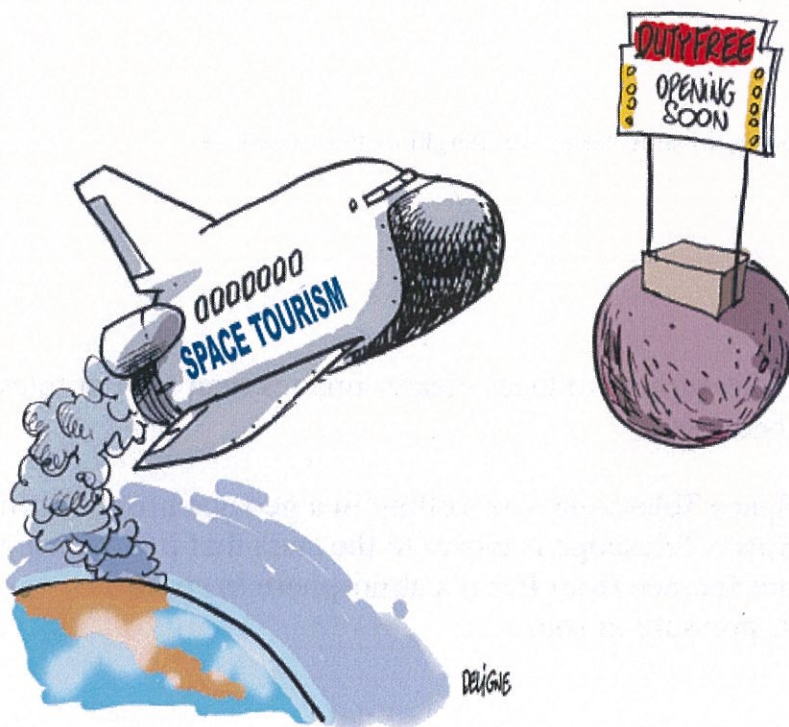
- a. Prism
- b. Spectrum
- c. Spectral line
- d. Spectra

14. Which of the following planets is considered to be terrestrial?

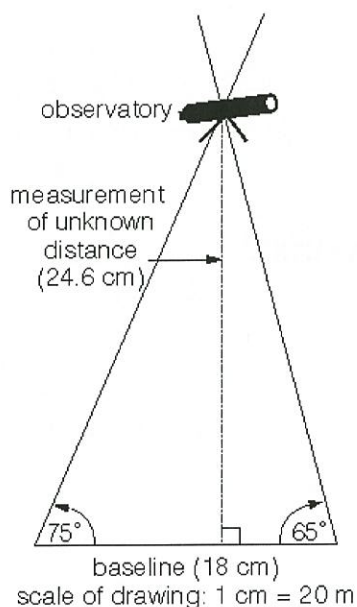
- A. Saturn
- B. Jupiter
- C. Uranus
- D. Mercury

15. Which of the following is a benefit of adaptive optics?

- a. Reducing atmospheric distortion.
- b. Increasing magnification.
- c. Increasing the strength of the computers.
- d. Increasing the baseline for triangulation.



Examine the following diagram.



16. Using the diagram above, what is the distance to the observatory?

- a. 492 m
- b. 360 m
- c. 246 m
- d. 648 m

17. Using the diagram above, what is the actual length of the baseline?

- a. 9 m
- b. 360 m
- c. 38 m
- d. 18 m

18. The Hubble Space Telescope produces clearer images than similar telescopes that are used on Earth because

- A. the Hubble Space Telescope is travelling in a geosynchronous orbit
- B. the Hubble Space Telescope is closer to the stars that it is viewing
- C. there is no interference from Earth's atmosphere in space
- D. there is no air pressure in space

19. What gas makes up the majority of the atmosphere of Jupiter, Saturn, Uranus, and Neptune?
- a. Carbon dioxide
 - b. Oxygen
 - c. Hydrogen
 - d. Methane

Use the following diagram to answer question 20.



20. What is the student in the illustration above **most likely** trying to determine?

- A. The altitude of the sphere
- B. The azimuth of the sphere
- C. The distance to the sphere
- D. The diameter of the sphere

21. Connecting radio telescopes to multiply their capabilities is known as

- a. VLA.
- b. electromagnetic radiation multiplication.
- c. adaptive optics.
- d. interferometry.

22. Canadians watched as astronaut Chris Hadfield sent informative videos to Earth from Space. He sent these videos from:

- a. Apollo 11
- b. Apollo 16
- c. Voyager 1
- d. The International Space Station

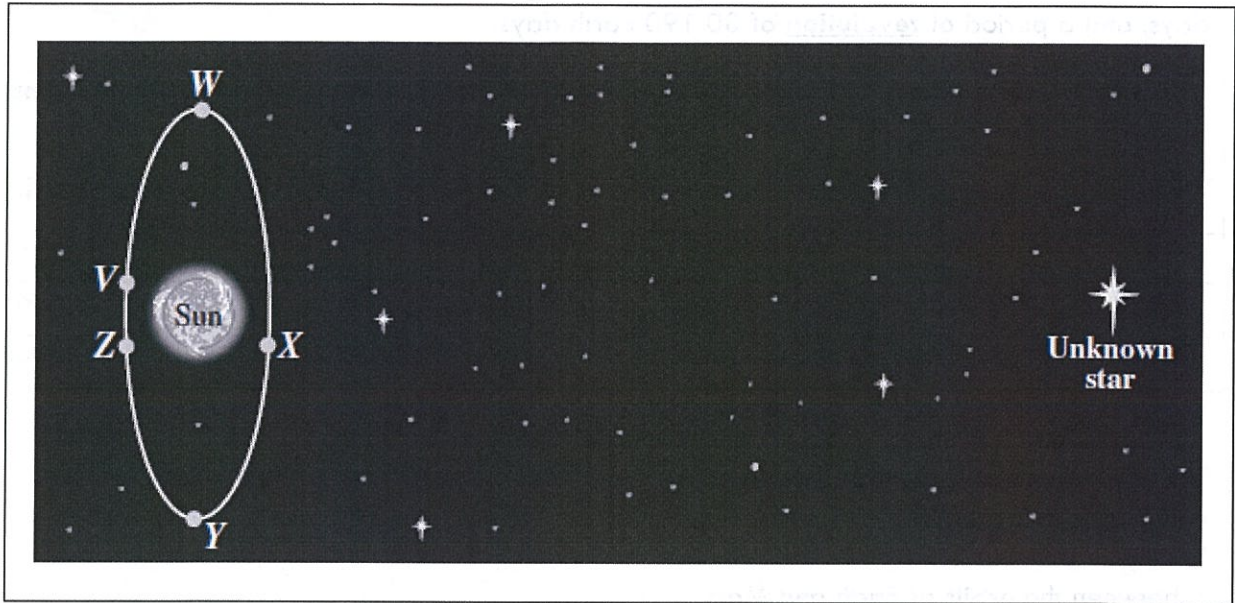
23. Astronomers can use a spectroscope to

- A. determine the composition of stars
- B. map the location of celestial bodies in the sky
- C. observe celestial bodies that were previously invisible
- D. see images in space that are not distorted by Earth's atmosphere

24. This science is the study of the physics, chemistry, and mathematics of celestial objects:

- a. Astrology
- b. Astronomy
- c. Astrolabe
- d. Astroscience

Use the following to answer question 25.



25. The best baseline for triangulation to determine the distance between the unknown star and the sun shown above will be established when Earth is in positions W and

- A. V
- B. X
- C. Y
- D. Z

26. A vast collection of stars held together by gravitational attraction is

- a. galaxy
- b. nebula
- c. solar system
- d. constellation

27. An unknown gaseous planet has a radius of 24 764 km, a period of **rotation** of 0.67 Earth days, and a period of **revolution** of 30 190 Earth days.

Planet	Radius (km)	Period of Rotation (Earth Days)	Period of Revolution (Earth Days)	Planet Composition
Earth	6 378	1	365	Terrestrial
Mars	3 397	1.03	687	Terrestrial
Saturn	60 268	0.44	10 765	Gaseous
Uranus	25 559	0.72	30 687	Gaseous

The unknown planet would be found

- a. inside Earth's orbit
- b. outside Uranus's orbit
- c. between the orbits of Earth and Mars
- d. between the orbits of Saturn and Uranus

28. Models of the universe that place Earth at the centre are described as

- A. heliocentric models
- B. astronomic models
- C. geocentric models
- D. galactic models

29. The orbit that Earth makes around the sun is best described as

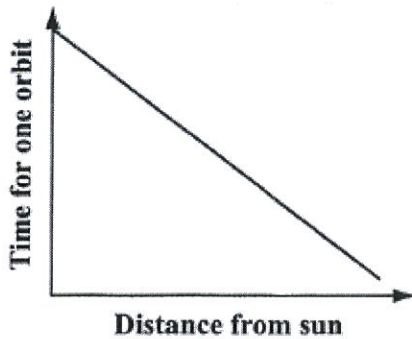
- A. circular
- B. celestial
- C. elliptical
- D. gravitational

30. Mars is visible on a clear night because it

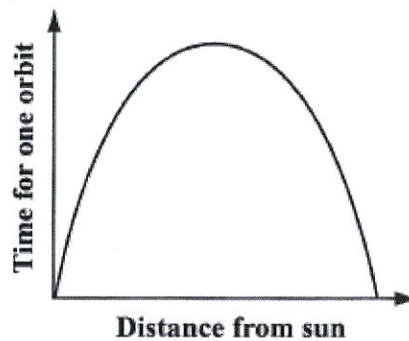
- A. reflects light
- B. refracts light
- C. absorbs light
- D. produces light

31. Which of the following graphs correctly represents the relationship between the orbit times of planets and their distance from the sun?

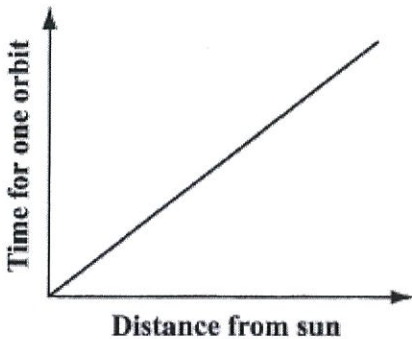
A.



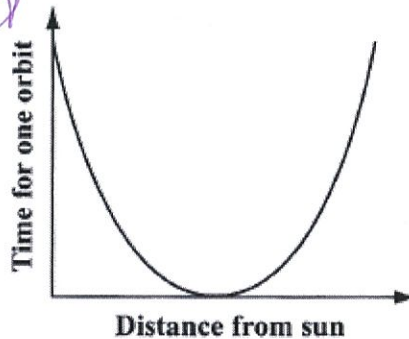
B.



C.



D.



32. Triangulation is the measurement process that astronomers use to estimate the

- A. size of a celestial body
- B. orbit of a celestial body
- C. distance to a celestial body from Earth**
- D. angle between a celestial body and Earth

33. A celestial object that is located 10° above the horizon in the northeast part of the sky has an

- A. azimuth of 45° and an altitude of 10°**
- B. azimuth of 10° and an altitude of 45°
- C. azimuth of 315° and an altitude of 10°
- D. azimuth of 10° and an altitude of 315°

Use the following to answer question 34.

True and False Statements About Refracting Telescopes

- Statement 1** Refracting telescopes use mirrors. ✓
- Statement 2** Refracting telescopes were the first type to be designed.
- Statement 3** The image from a refracting telescope is not distorted by atmospheric interference. ✗
- Statement 4** A refracting telescope has an eyepiece and an objective lens. ✓

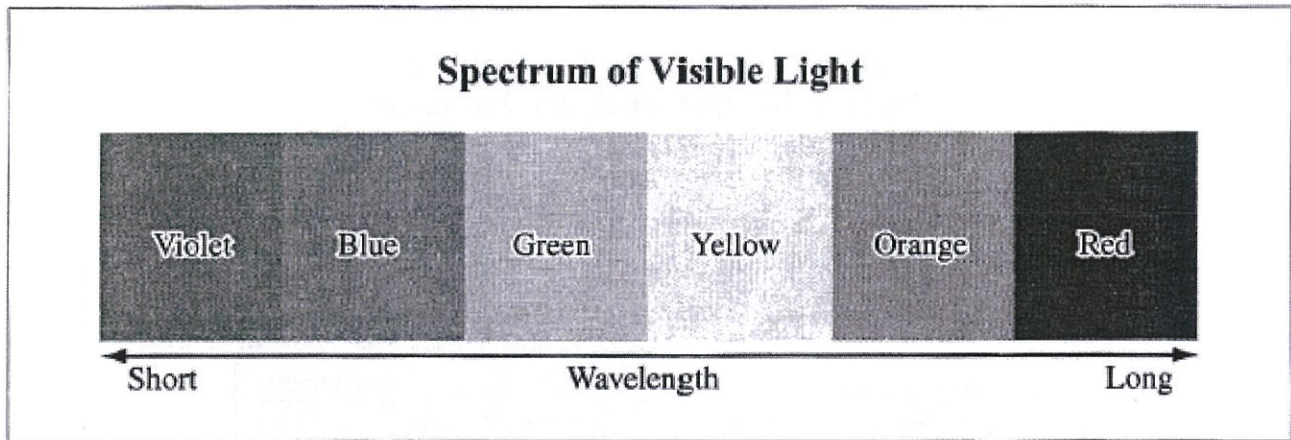
34. Which of the statements above are true?

- A. Statements 1 and 3
- B. Statements 1 and 4
- C. Statements 2 and 3
- D. Statements 2 and 4
-

35. Most of the outer planets of our solar system are

- A. gaseous, small, and have few moons
- B. gaseous, large, and have many moons
- C. terrestrial, small, and have few moons
- D. terrestrial, large, and have many moons

Use the following to answer question 36.



36. Which of the following descriptions identifies a red-shifted star?

- A. A star that is larger than Earth
- B. A star that is smaller than Earth
- C. A star that is moving toward Earth
- D. A star that is moving away from Earth

Use the following to answer question 37.

Information about Jupiter

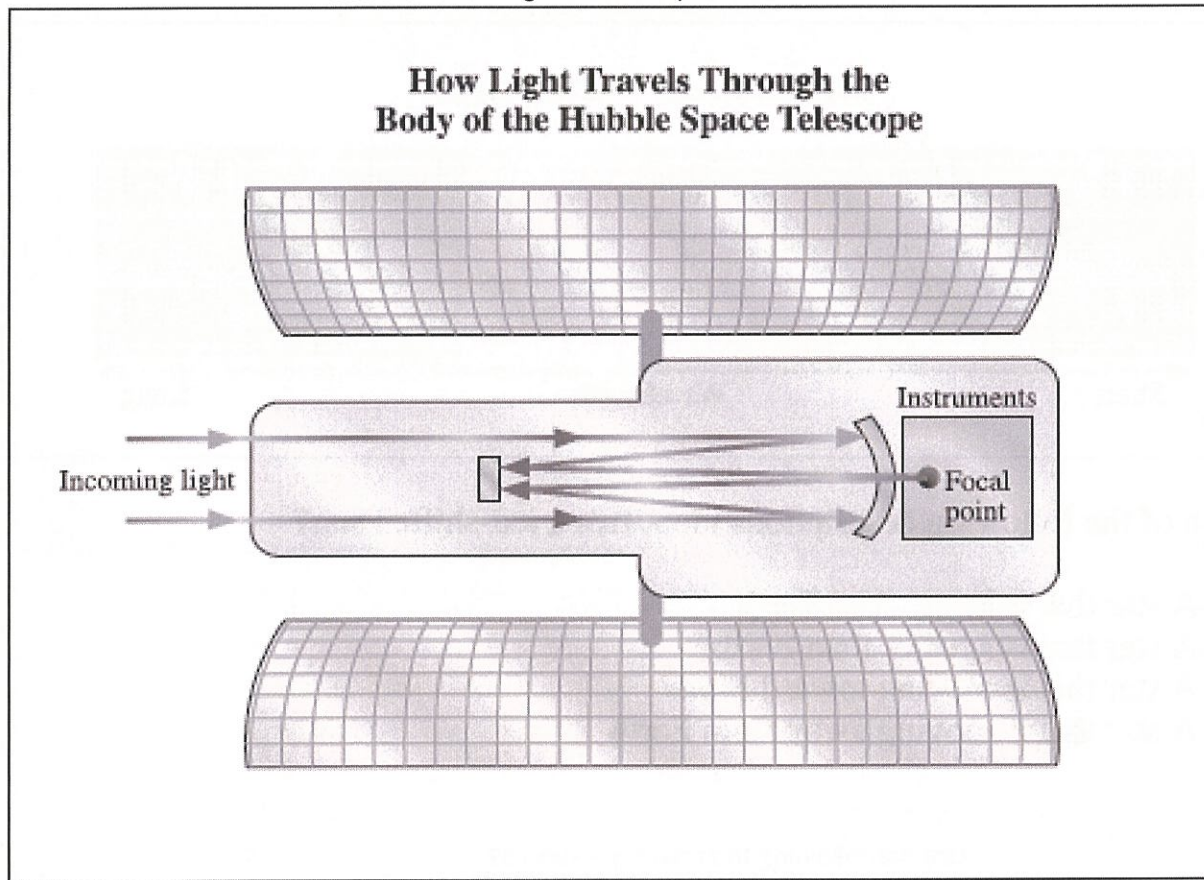
Length of year = 142 Earth months
Length of day = 10 Earth hours

37. *Jupiter spins on its axis* *i* *than Earth does, and it has an orbit that is* *ii* *than Earth's.*

The statement above is completed by the information in row

Row	<i>i</i>	<i>ii</i>
A.	slower	larger
B.	slower	smaller
<input checked="" type="radio"/> C.	faster	larger
D.	faster	smaller

Use the following to answer question 38.



38. The Hubble Space Telescope uses i to ii the light into the focal point.

The statement above is completed by the information in row

Row	<i>i</i>	<i>ii</i>
A.	lenses	reflect
B.	lenses	refract
C.	mirrors	reflect
D.	mirrors	refract

Section B: Numerical Response: Record your answers on the numerical response sheet.

Numeric Response #1

Use the following information to answer numerical response question 1.

Statement #1 Humans should send animals into space to test the effects of zero gravity

Statement #2 There are no Regulations regarding military use of space

Statement #3 Dead satellites and other space junk litter Earth's orbit

Match each statement with the type of issue to which it refers to below

<u>2</u>	<u>3</u>	<u>1</u>
Political	Environmental	Ethical

(Record all THREE digits of your answer in the numeric response section on the bubble answer sheet)

Use the following to answer numerical response question 2.

Four Parts of the Universe

- 1 Solar system
- 2 Milky Way
- 3 Jupiter
- 4 The moon

Numerical Response

2. List the parts of the universe given above in order from the part with the smallest mass to the part with the greatest mass.

4, 3, 1, and 2.
Smallest mass **Greatest mass**

(Record all four digits of your answer in the numerical-response section on the answer sheet.)

Use the following to answer numerical response question 3.

Over time, several technologies have been developed to study and explore space.

Technologies

- 1 Shuttle
- 2 Radio telescope
- 3 Probe

Numerical Response

3. Match each of the technologies numbered above with its description given below.

Designed to detect low-frequency energy from space 2 (Record in the first column)

Designed to explore celestial bodies beyond the Moon 3 (Record in the second column)

Designed to transport equipment to the International Space Station 1 (Record in the third column)

(Record all three digits of your answer in the numerical-response section on the answer sheet.)

Section C: Short Answer: Complete your answer in full sentences.

1. What is the Doppler Effect? How do astronomers use the Doppler Effect to study the motion of stars?(Use the terms "red-shifted" and "blue-shifted" in your answer.) (3 marks)

Change in frequency due to movement
Red - moving away
Blue - moving towards

2. List two contributions made by Canadians to space research. (2 Marks)

Canadians
Chris Hadfield

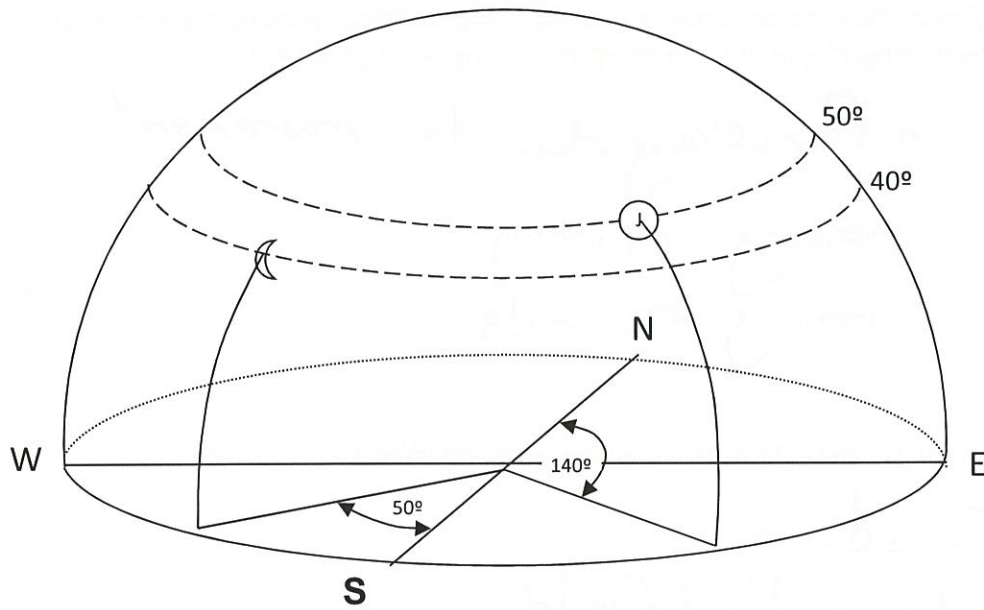
3. Why were "stage" or "multistage" rockets developed? (1 Mark)

Go farther

4. What are three differences between the inner and outer planets? (3 Mark)

- Size
- Fewer moons inner
- Rocky inner

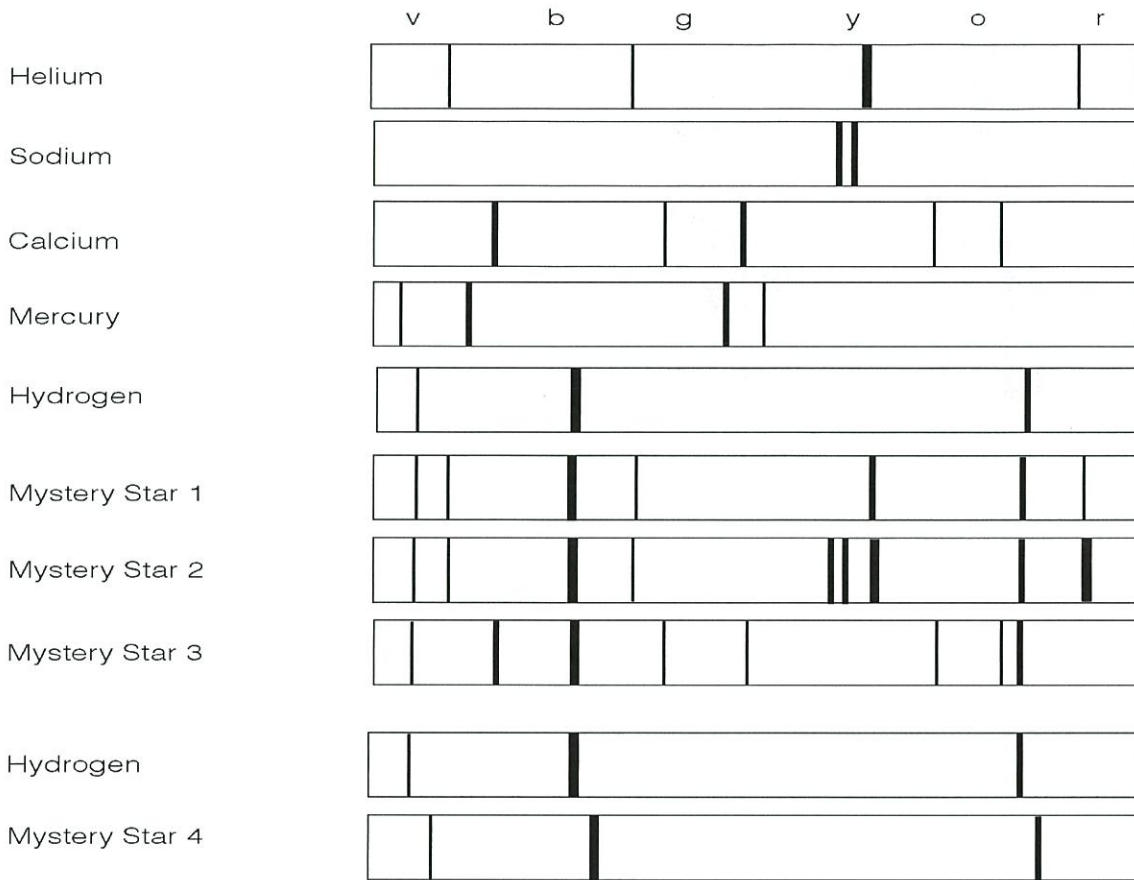
Use this diagram to answer the next question.



5. Write the altitude-azimuth co-ordinates for the Moon and Jupiter in the diagram. (2 marks)

140, 50 moon
230, 40 Jup

Analyze the spectra below in order to answer questions 6 and 7.



6. List the chemical elements in Mystery Star 2: (1 mark)

H, Na, He

Describe what is happening with Mystery Star 4 and what it is composed of: (2 marks)

Red shifted, H, moving away

Numerical Response Answer Sheet

Name: _____

NR 1

NR 2

NR 3

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•	•		
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

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0	0	0	0
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3	3	3	3
4	4	4	4
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7	7	7	7
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9	9	9	9

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7	7	7	7
8	8	8	8
9	9	9	9