

3) a) [1] What is the ecliptic?

b) [1] What is a heliacal rising?

c) [1] What is the spring equinox?

4) Magnification of a telescope

A telescope has an objective lens of diameter 8 inches and focal length 200 cm.

a) If an eyepiece of focal length 40 mm (40 mm = 4 cm) is used, what is the magnifying power of this telescope?

[2] _____.

b) If a magnifying power of 200 is desired, what should the focal length of the eyepiece be for this telescope?

[2] _____.

c) What is the maximum useful magnification of this telescope?

[2] _____.

5) What are the three major properties of a telescope, and what does each depend on?

a) [2]

b) [2]

c) [2]

6) [4] Draw a picture of a **reflecting** telescope with a **Newtonian** focus and be sure to label all the relevant elements:

7) Effect of the atmosphere on light:

What are the three major ways the atmosphere affects light from astronomical objects? Give one example of each.

a) [1]

example: [1]

b) [1]

example: [1]

c) [1]

example: [1]

8) [8] List the planets in order of increasing distance from the sun (i.e., start with the closest planet and end with the farthest planet based on average distance) and give the approximate distance (in A.U.) from the sun for each of the planets.

<u>NAME</u>	<u>DISTANCE (in A.U.)</u>	<u>NAME</u>	<u>DISTANCE</u>
1.(nearest):	_____;	5.	_____;
2.	_____;	6.	_____;
3.	_____;	7.	_____;
4.	_____;	8.	_____;
		9.(farthest):	_____;

9) Tell when the moon **rises** when it is at the following four phases:

- a) [1] first quarter:
- b) [1] new moon:
- c) [1] third quarter:
- d) [1] full moon:

10) Fill in the following for two stars (excluding the sun) [5]

NAME	IN WHICH CONSTELLATION	ABSOLUTE MAGNITUDE	APPARENT MAGNITUDE	DISTANCE FROM EARTH	SPECTRAL CLASS
-----	-----	-----	-----	-----	-----
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

11) Draw an H-R diagram, labeling both axes and indicating where the main sequence, giants, supergiants and white dwarfs are located. Also, place the sun and the two stars of problem #10 on the diagram. [6]



12. a) Distinguish between brightness and luminosity: [2]

b) Distinguish between apparent magnitude and absolute magnitude: [2]

13) Draw another H-R diagram, labeling the axes and showing the position of the main sequence, and then draw in the life cycle of a star like the sun, and explain what is happening at each stage of the cycle. [4]



14) What are the three main cosmological facts?

1. [1]

2. [1]

3. [1]

15) a) Briefly describe the "Big Bang" theory: [2]

b) Discuss how it explains the three main cosmological facts:

1. [1]

2. [1]

3. [1]

16) a) According to the "Big Bang" theory, how old is the universe? [2] _____.

b) Describe two ways in which this age is determined:

1. [1]

2. [1]

17) Fill in the distances to the following:

	Miles	A.U.	light years
1. Circumference of the earth [1]	_____		
2. Distance from earth to the moon [1]	_____		
3. Distance from earth to the sun [1]	_____	1	
4. Distance from sun to Neptune [1]		_____	
5. Distance from sun to the nearest star [1]		_____	_____
6. Distance across the Milky Way [1]			_____
7. Distance to Andromeda galaxy [1]			_____
8. Distance to the center of our Super Cluster (Virgo cluster) [1]			_____
9. Distance to the furthest quasar [1]			_____

18) TRUE OR FALSE: (for each: +1 if correct, 0 if you leave it blank, -1 if wrong)

- F a) The sun and moon follow the ecliptic across the sky but the planets **wander all over** the sky..
- T b) The stars rise about 4 minutes earlier each day.
- F c) The earth emits a lot of **UV** radiation which allows it to cool after being heated by the sun.
- T d) A blue photon has a higher energy than a red photon.
- T e) A “day” on the moon is the same as a month on the earth – 29.5 earth days.
- F f) All of the planets have moons **except Mercury**.
- T g) Only the lighter elements, like carbon and oxygen, are made in the interior of stars. Elements heavier than iron are not.
- T h) Our sun will probably turn into a red giant star in about 5.5 billion years.
- T i) New stars, including O and B stars, form only in the spiral arms of our galaxy, not in the central bulge.
- F j) Planetary nebula **eventually collapse** and form planets.