

Name _____

Date _____

**Environmental Science Review Sheet - Exam IV
Stellar Evolution, Galaxies, and the Big Bang**

**THIS REVIEW SHEET IS DUE ON WEDNESDAY, NOVEMBER 4th
EXAM DATE - FRIDAY, NOVEMBER 5th**

Section I - Stellar Evolution (Pages 684 - 687)

1) Stars are born in clouds of dust and gas (remnants of supernovae) called

_____.

2) Nebulas consist of approximately _____ % H and _____ % He.

3) What causes the initial attraction of particles? _____

4) What force causes a temperature increase amongst the cloud of dust and

gas? _____

5) A _____ (not yet a star) forms when sufficient heat is

generated to emit long wavelength red light; however, since

_____ has not yet occurred it is not classified as a

star.

6) A star is officially born when _____

occurs which is the conversion of _____ to _____ atoms.

7) When is the star considered a main-sequence star? _____

8) Explain which type of star will last longer: *a hot, massive star* or a *cooler, less massive star*? Why?

9) Stars generally spend about _____ % of their lifetimes as main-sequence stars.

10) How long has our star (Sun) been around and how long will it continue to generate fusion? _____

11) A low to medium-mass star will continue to produce energy until all the usable H is consumed. At that point the core contracts because _____

12) As the core continues to contract more and more heat is generated. What does this cause? _____

13) The death of low and medium-mass stars result in a _____
_____ most about the size of Earth.

14) In medium mass stars the outer shell drifts off into space creating a ring around the central core (white dwarf). This cloud of dust and gas surrounding the white dwarf is called a _____.

15) The death of high mass stars (those with eight or more solar masses end in colossal implosions called _____.

16) How does a supernova occur? _____

17) The end result of a supernova is either a _____

or a _____.

Section II - Stellar Remnants (Pages 688-692)

1) Densities are so great in white dwarfs that gravity causes electrons to be pulled toward the nucleus of the atom. This explains

2) Matter in the state described above is known as _____

3) Eventually, the white dwarf will become a _____

once it cools.

4) Why are there probably no black dwarfs in existence as of right now?

5) Some made of matter with even greater densities are known to exist.

They not only pull electrons toward the nucleus, but are actually forced to combine with protons in the nucleus. These are called _____

_____. A "pea-sized" portion of one of these stars would weigh as much as 100 million tons!

6) How large are neutron stars? _____

7) Neutron stars get their names because _____

8) Another name for neutron stars are _____.

This is due to their rapid rotation generating _____

which cause them to appear to blink.

9) Cores of stars that have densities so great that the nucleus itself collapses out of space and time a _____ is created.

10) A black hole's gravity is so great that _____

Section III - The Milky Way Galaxy (Pages 692-693)

1) The name of our galaxy is called _____

2) What are the dimensions of the Milky Way Galaxy? Also, please indicate where the Sun (and our solar system is) is in relation to the Galaxy. Please illustrate on the diagrams below:

Section IV - Normal Galaxies (Pages 693-695)

1) In the 1700s, the German philosopher, _____
proposed that patches seen in the night sky between stars were

2) Why was his theory not widely accepted at that point? _____

3) Who was given credit for concluding that these "patches" were indeed
distant galaxies? _____

4) Hubble discovered the only galaxy visible from Earth with the naked eye
called the _____ Galaxy. As a result of his
discovery he _____

5) What are the three types of normal galaxies? _____

6) What type of galaxy is the Milky Way? _____

7) What is the general size of a spiral galaxy? _____

8) About _____ % of galaxies are _____ galaxies.

9) Elliptical galaxies are generally smaller than spiral galaxies; however, there are exceptions in that some can be _____ light years in diameter.

10) _____ % of galaxies make up _____ galaxies which have no definite shape.

11) Stars in the Milky Way's outer arms consist of _____ stars while stars toward the galactic center consist of _____ stars.

12) Clusters of galaxies are called _____.

Our Galaxy, the Milky Way, is part of one such cluster in the _____ which consists of 28 galaxies.

Section V - The Expanding Universe (Pages 696-697)

1) Explain how the Doppler effect operates: _____

2) How does the Doppler effect relate to the movement of galaxies?

3) If an object has a "red shift" the object is moving _____
_____ whereas if the object has a "blue shift" the
object is moving _____

4) What does Hubble's Law state? What does this mean? _____

5) What does the big bang theory state? _____

6) What are three (3) pieces of evidence that support the big Bang?

1) _____

2) _____

3) _____

7) What are the two theories as to the fate of the universe? Which is the most accepted? Explain!! _____

8) What is dark matter and how might that be affecting the universe?
