University of Mississippi
ASTR 101, Fall 2012

Name: _____

Midterm Test 2

Circle the letter next to your choice of answer for each multiple-choice question (do not write the letter next to the question).

(1) How large is the Sun's radius, compared to the Earth's?
a. Four times larger.
b. 10 times larger.
c. 100 times larger.
d. 100,000 times larger.

(2) Why are most asteroids not round like planets are?
a. Their gravity is not strong enough to make them round.
b. They are irregularly shaped pieces of a planet that broke up.
c. Because they have suffered many more collisions.
d. Because they don't rotate as fast as planets do.

(3) How does the far side of the Moon differ from the one we see?
a. It is older and more cratered, and has almost no "maria".
b. It is almost completely smooth, with fewer craters.
c. It is covered in ice because it never sees the sunlight.
d. It is not that different, on average it looks about the same.

(4) Can we tell the size of a star from a picture taken with a good telescope?
a. No, image size for stars does not reflect actual size and we need more information.
b. Yes, large telescopes magnify images enough for us to see the sizes of most stars.
c. Yes, we can find the size from the brightness of the image on the photograph.
d. Yes, we can find the size from the color of the star's image on the photograph.

(5) Why isn't Pluto officially called a planet anymore?
a. Because it has too few moons to be a regular planet.
b. Because when detailed pictures were obtained, astronomers realized it does not have the right composition.
c. Because its orbit does not follow Kepler's laws like the planets' orbits do.
d. Because it is just one of many similar, relatively small objects orbiting the Sun in the same region.

(6) The absolute magnitude of a star is a measure of
a. How large the star is, as determined from an actual photograph.
b. How large the star would appear to be, if it was where the Sun is.
c. How bright the star would be in the sky under perfect visibility conditions.
d. How bright the star would be if it was at a distance of 10 pc from us.

(7) Which ones of these objects are likely to come from the Kuiper belt?
a. Comets.
b. Auroras.
c. Asteroids.
d. Meteorites.

(8) In what way is Venus like a greenhouse?
a. The sky on Venus is green because of the color of the clouds.
b. The planet's surface is covered with plants but there is no animal life.
c. The atmosphere keeps the planet hot by trapping the heat it releases.
d. The atmosphere is totally transparent to sunlight, like a glass cover.

(9) Did astronomers predict the existence of the planet Neptune before it was discovered?
a. No, nobody suspected its existence before it was discovered.
b. Yes, because Ptolemy had written about it in his book "The Almagest".
c. Yes, because there is one planet for every 10 AU of distance from the Sun.
d. Yes, from the motion of Uranus, which showed an extra force acting on it.

(10) When can an object in space be called a star?
a. When it has a clearly defined surface and spherical shape.
b. When it starts shining because it emits light and radiation.
c. When energy is produced in its core by nuclear reactions.
d. When we can see it with our telescopes from Earth.

(11) Can asteroids be seen with the naked eye?
a. No, they are all way too dim.
b. Yes, they look like planets but they move faster.
c. Yes, many are about as bright as some faint stars.
d. Only the four brightest asteroids can be seen.

(12) What are the best times for viewing Mercury from Earth with the naked eye?
a. In the middle of the day, around noon.
b. In the middle of the night, close to midnight.
c. Right before dawn or after sunset.
d. In the late Spring or early Summer.

(13) Why are features on the Moon such as craters not as eroded as those on Earth?
a. The Moon lacks winds and running water that cause erosion.
b. The crust of the Moon is made of harder material than the Earth's.
c. The Moon is much younger than the Earth.
d. There force of gravity is weaker on the Moon.

(14) Approximately how far from us is the nearest star (other than the Sun)?
a. 4 million miles.
b. 4 astronomical units.
c. 4 light years.
d. 4 million light years.

(15) After the Sun goes through its red giant phase, what will most of its outer layers and atmosphere become?
a. A planetary nebula.
b. A molecular cloud.
c. A post-stellar nebula.
d. A supernova remnant.

(16) How far is the Earth from the Sun?
a. About 6400 km.
b. About 150,000,000 km.
c. About 1 light year.
d. About 40 AU.

(17) Have we proved or disproved the existence of life on Mars?
a. No, we have no conclusive evidence either way yet.
b. Yes, we know that there are microorganisms living on Mars.
c. Yes, we know that microbial life did once exist on Mars but is now extinct.
d. Yes, we know that it is impossible for life to have ever arisen on Mars.

(18) What does the surface of Mercury look like?
a. Rocky and cratered, similar to our Moon.
b. Rocky and hard, but completely smooth.
c. Completely covered by clouds.
d. Completely covered by ice.

(19) Does Jupiter have moons?
a. Yes, it has one moon, the largest in the solar system.
b. Yes, it has four moons, that were first seen by Galileo.
c. Yes, more than 60, four of which were seen by Galileo.
d. No, we don't know of any so far.

(20) In the Sun's convection zone, what is the main thing convection does?
a. It moves sunspots across the surface of the Sun.
b. It carries solar wind particles outwards into space.
c. It takes hot gas from the interior toward the Sun's surface.
d. It makes hydrogen atoms turn into helium atoms in the core.

(21) Does Saturn have volcanoes?
a. We haven't seen any yet, but the Cassini spacecraft is now looking.
b. No, there cannot be volcanoes on a planet without a solid surface.
c. Yes, in fact Saturn's rings were formed from material ejected by the volcanoes.
d. Yes, but because Saturn is so massive, the volcanos are small and hard to see.

(22) Which of the following things do you actually see when looking at an eclipsing binary star system?
a. A star from which the amount of light we receive changes in time.
b. A star for which the frequency of the spectral lines changes in time.
c. One whose visible spectrum shows both emission and absorption lines.
d. A two-star system in which both stars can be seen.

(23) Why can a comet have more than one tail?
a. One is made of gas (ions), the other one of dust particles.
b. Each time the comet comes near the Sun, it may get a new tail.
c. If the comet swings by a planet and is deflected, it gets a new tail.
d. If a comet has two tails, this means it has broken up into two pieces.

(24) Has the Earth ever been hit by an asteroid?
a. Yes, large asteroids hit the Earth several times per year.
b. Many times in the past, but now violent impacts are very rare.
c. Only twice (formation of the Moon and extinction of the dinosaurs).
d. No, fortunately never.

(25) Which of the following is a difference between an open cluster and a globular cluster?
a. Open clusters can contain hundreds of stars, globular clusters at most a few.
b. Open clusters can contain hundreds of stars, globular clusters hundreds of thousands.
c. Globular clusters are made of globules that are not stars yet, open clusters are made of stars.
d. Globular clusters are young and still round, open clusters are old and have started to break up.

(26) What is the first element produced from hydrogen fusion inside stars?
a. Helium.
b. Carbon.
c. Iron.
d. Plutonium.

(27) Do we have spacecraft currently sending data from Mars, either on the surface or in orbit around it?
a. Yes, in fact we have three astronauts exploring Mars and building a base.
b. Yes, we have spacecraft both in orbit around Mars and on the surface.
c. Not yet, but one mission is on its way and will reach Mars soon.
d. No, but NASA and ESA are planning several future missions.

(28) When was Jupiter discovered?
a. In 1930.
b. Around 1600.
c. Around AD 200.
d. Jupiter is easily seen with the naked eye, so it was known since prehistory.

(29) Why do certain meteor showers occur around the same date every year?
a. Because meteor showers depend on the phase the Moon is in.
b. Because those are the times when there are more stars in the sky.
c. Because the Earth goes through the same trail of comet debris along its orbit.
d. Because the atmosphere needs to be at the right temperature.

(30) What are Saturn's rings made of?
a. A hot plasma of ionized gas inside a strong magnetic field.
b. A large number of icy particles and chunks of various sizes.
c. A thin, shiny sheet of liquid water surrounding the planet.
d. A smooth, spinning solid disk of dust-covered rocky material.

(31) What do you need to know about a star to place it in the HR diagram?
a. Velocity and temperature.
b. Temperature and luminosity.
c. Luminosity and distance.
d. Distance and velocity.

(32) How large is Uranus compared to the Earth?
a. About half the radius.
b. About twice the radius.
c. Almost four times the radius.
d. Almost ten times the radius.

(33) What are comets?
a. Tiny fragments of ice crystals scattered around the solar system.
b. Fireballs that come to the solar system from outer interstellar space.
c. Icy planetesimals, sometimes miles across, from the outer solar system.
d. Dust grains that burn up and develop a tail when entering Earth's atmosphere.

(34) Have there been supernova explosions in our galaxy?
a. Yes, we see several of them every year.
b. Yes, but the last one was seen about 400 years ago.
c. Probably, but none has actually been observed by humans.
d. Not yet, so far we have seen them only in other galaxies.

(35) During what part of the year is Venus likely to be high above the horizon at midnight?
a. Never.
b. In summer.
c. When the Moon is in the new phase.
d. In winter.

(36) What is unusual about Uranus' rotation?
a. It is the fastest rotation of all planets in the solar system.
b. It has changed direction several times since we started observing it.
c. The axis is tilted on its side about 90°, almost in the plane of the orbit.
d. Uranus is the only planet that doesn't rotate at all.

(37) To what extent have spacecraft from Earth explored Neptune?
a. No spacecraft has ever been close to Neptune yet.
b. There has only been a flyby by Voyager 2 years ago.
c. There is a spacecraft in orbit around Neptune right now.
d. We have a rover exploring Neptune's surface right now.

(38) How can we find neutron stars?
a. If they are not surrounded by glowing matter there is no way for us to find them.
b. They can often be seen as pulsars, from which we get pulses of radio waves.
c. We recognize them because they shine more brightly than any other regular star.
d. We look for stars whose brightness changes over a period of a few days.

(39) Which of these is a possible cause for a supernova?
a. The formation of a bright young star out of interstellar matter.
b. The collapse of the core of a very massive star at the end of its life.
c. The formation of a new galaxy out of intergalactic matter.
d. The expansion of a small star to supergiant size at the end of its life.

(40) According to the leading theory, how was the Moon formed?
a. Something the size of a small planet collided violently with the Earth.
b. The Moon used to be another planet, and it was captured by the Earth's gravity.
c. The Earth and the Moon formed side by side at about the same time.
d. The Earth was spinning fast, broke into two pieces, and one became the Moon.