

NAME: _____ DATE: _____ PER: _____

UNIT 6: THE UNIVERSE TEST

Multiple Choice: Identify the letter of the choice that best completes the statement or answers the question.

1. The table below compiles information about the distance of various stars from Earth, their apparent magnitude, and their absolute magnitude.

Apparent Magnitude and Absolute Magnitude of Various Stars

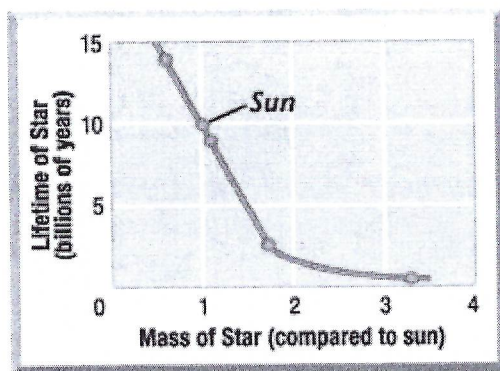
Star	Distance from Earth (light years)	Apparent Magnitude	Absolute Magnitude
Sirius	8.6	-1.46	1.4
Vega	25	0.03	0.6
Arcturus	34	-0.04	-0.3
Aldebaran	60	0.85	-0.3
Rigel	1,400	0.12	-8.1
Betelgeuse	1,400	0.50	-7.2

Which of the stars listed in the table above would look the brightest when observed from Earth?

- A. Sirius
 - B. Rigel
 - C. Arcturus
 - D. Aldebaran
2. Which of the following ends its life cycle in the form of a neutron star or a black hole?
- A. a galaxy
 - B. a constellation
 - C. a low-mass star
 - D. a high-mass star
3. How are elliptical galaxies and spiral galaxies different?
- A. Elliptical galaxies have little gas and dust.
 - B. Elliptical galaxies vary more in shape than spiral galaxies.
 - C. Spiral galaxies have almost no gas or dust.
 - D. Spiral galaxies contain only old stars.

4. Radar sensors on high-altitude aircraft and on space platforms such as the space shuttle have been used to produce three-dimensional maps of Earth's surface. These radar sensors use electromagnetic wavelengths that have the lowest energy. What type of electromagnetic radiation do these radar sensors use?
- A. x-rays
 - B. ultraviolet
 - C. gamma rays
 - D. radio waves

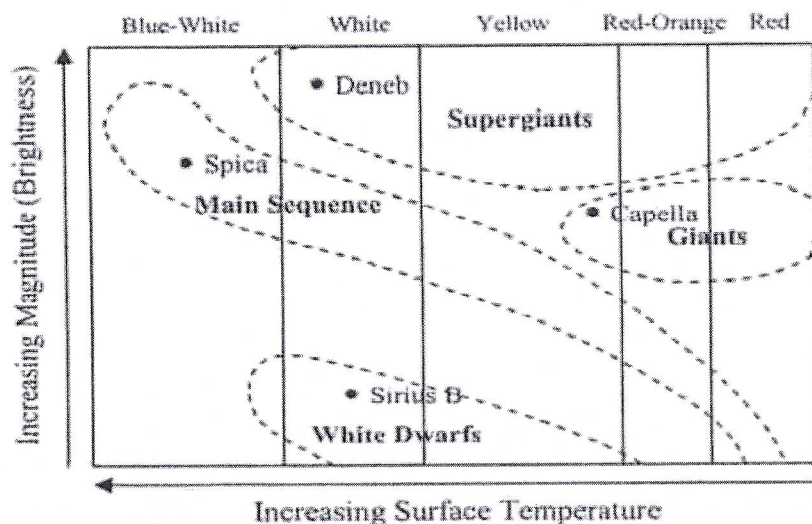
Use the figure below to answer questions #5, 6, and 7.



5. How long does the Sun live?
- A. 0.8 billions of years
 - B. 10 billions of years
 - C. 2.5 billions of years
 - D. 14 billions of years
6. How long does a star with 1.7 times the mass of the sun live?
- A. 0.8 billions of years
 - B. 10 billions of years
 - C. 2.5 billions of years
 - D. 14 billions of years
7. How long does a star with 0.8 times the mass of the sun live?
- A. 0.8 billions of years
 - B. 10 billions of years
 - C. 2.5 billions of years
 - D. 14 billions of years
8. Different types of electromagnetic waves have different wavelengths. Which of these electromagnetic waves has the shortest wavelength?
- A. x-rays
 - B. radio waves
 - C. gamma rays
 - D. ultraviolet light

Use the H-R diagram to answer questions 9-12.

The Hertzsprung-Russell Diagram



9. What is the general relationship between the surface temperature and brightness of a Main Sequence star?
 - A. As the temperature increases, the brightness decreases.
 - B. As the temperature increases, the brightness increases.
 - C. As the temperature increases, the brightness remains the same.
 - D. As the temperature remains the same, the brightness increases.

10. The White Dwarfs are a group of stars that are—
 - A. extremely bright and extremely hot.
 - B. low in brightness but average in temperature.
 - C. average in brightness but high in temperature.
 - D. average in brightness and average in temperature.

11. The Sun is a yellow star that is average in both brightness and in temperature. The Sun belongs to which group?

A. Supergiant B. Giants C. Main Sequence D. White Dwarfs

12. Which of these sequences the stars from least to greatest in magnitude?
 - A. Sirius B, Capella, Spica, Deneb
 - B. Capella, Sirius B, Deneb, Spica
 - C. Sirius B, Spica, Capella, Deneb
 - D. Capella, Deneb, Sirius B, Spica

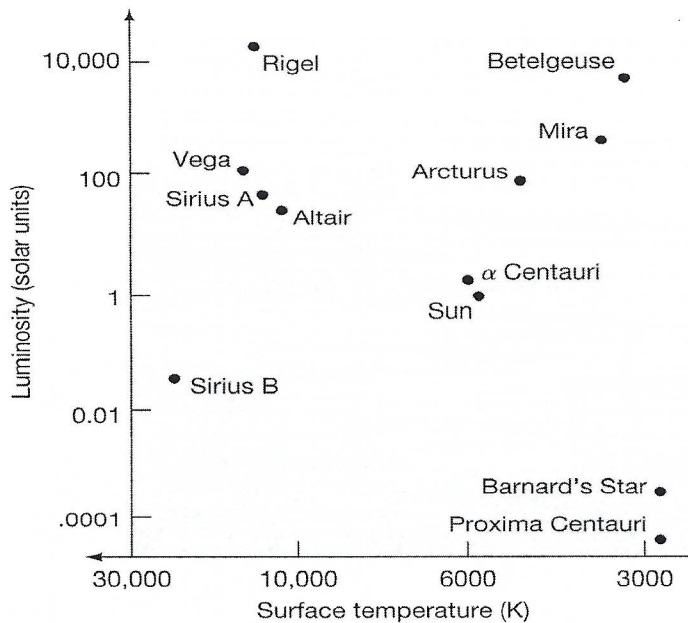
13. The force that tends to pull together the matter in a nebula is

A. gravity. B. nuclear fusion. C. expansion. D. nuclear fission.

14. A star is born when
- A. a nebula expands.
 - B. helium and oxygen combine.
 - C. nuclear fusion starts.
 - D. a protostar begins to cool.
15. It takes approximately 8 minutes and 20 seconds for light produced by the Sun to reach the Earth. Therefore, the Sun is located –
- A. much less than one light year from the Earth.
 - B. about one light year from the Earth
 - C. about 8.3 light years from the Earth.
 - D. more than 160 light years from the Earth.
16. What color are the hottest stars?
- A. blue-white
 - B. yellow
 - C. red
 - D. orange
17. When stars begin to run out of fuel, they first become
- A. red giants or supergiants.
 - B. supernovas.
 - C. white dwarfs
 - D. neutron stars.
18. Which of the following shows the correct sequence of celestial objects?
- A. universe \Rightarrow planet \Rightarrow galaxy \Rightarrow solar system
 - B. universe \Rightarrow galaxy \Rightarrow solar system \Rightarrow planet
 - C. planet \Rightarrow universe \Rightarrow galaxy \Rightarrow solar system
 - D. planet \Rightarrow galaxy \Rightarrow solar system \Rightarrow universe
19. A supernova is the explosion of a dying
- A. medium-sized star.
 - B. giant or supergiant star.
 - C. protostar.
 - D. stellar nebula
20. A light year is an appropriate unit for measuring the –
- A. distance between the Earth and the Moon.
 - B. time it takes to travel to Mars.
 - C. distance between galaxies.
 - D. time it takes to travel to the Sun.
21. Which of these statements best supports the Big Bang Theory?
- A. The Sun contains most of the mass that makes up the Solar System.
 - B. The three types of galaxies are spiral, elliptical, and irregular.
 - C. Galaxies show a red shift indicating they are moving away from each other.
 - D. The North Pole of the Earth points to Polaris the North Star.

22. Both reflecting and refracting telescopes are designed to
- break visible light into colors of the spectrum.
 - separate visible light from ultraviolet and radio waves.
 - collect and focus visible light.
 - work better with short-wavelength radiation.

Use the diagram below to answer questions 23-24



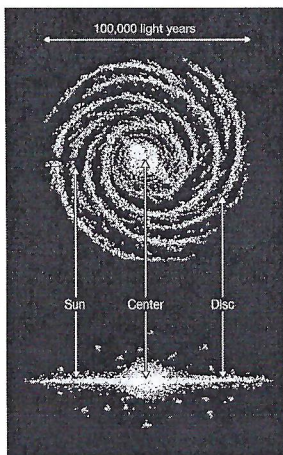
23. Where are the stars with the highest luminosity and temperature located?

- A. top, right B. top, left C. middle D. spin

24. Identify the star that is about 28,000°C, and has a luminosity <1

- A. Procyon B B. Rigel C. Spica D. Sirius B

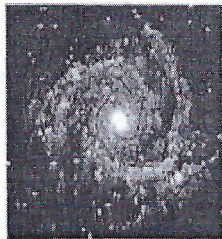
25. The diagram shows the Milky Way Galaxy. Note that the distance across the galaxy is 100,000 light years. If the sun is approximately half the distance between the center and the edge of the galaxy, about how far is the sun from the center of the galaxy in thousands of light-years?



- A. 50,000 ly B. 100,000 ly
C. 25,000 ly D. 35,000 ly

26. Stars with less mass will last longer than stars with more mass.
A. True B. False
27. The most massive stars—those having more than 40 times the mass of the sun become _____ when they die.
A. white dwarf B. neutron star C. black hole D. protostar
28. What will happen to the sun when it dies?
A. It will become a red giant then a white dwarf.
B. It will become a red giant, going through nova, then a neutron star.
C. It will undergo supernova, the remains of the star will become a black hole.
D. It will expand into a supergiant, then undergo supernova, the remains of the star will become a neutron star.
29. Parallax is method used to determine a nearby's star's
A. distance from Earth. B. temperature.
C. composition. D. brightness.

Use the diagram below to answer questions 30 and 31.



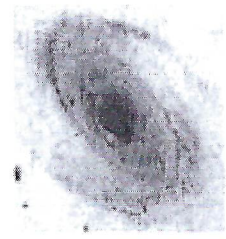
Galaxy W



Galaxy X



Galaxy Y



Galaxy Z

30. What do all galaxies have in common?
A. They are the same shape.
B. They are made of stars.
C. They are the same distance from Earth.
D. They travel around the Sun.

31. Which data table best classifies the galaxies shown in the diagrams?

A.

Example	Classification
W	spiral
X	Elliptical
Y	Spiral
Z	Irregular

B.

Example	Classification
W	Irregular
X	Elliptical
Y	Spiral
Z	Irregular

C.

Example	Classification
W	Spiral
X	Irregular
Y	Elliptical
Z	Spiral

D.

Example	Classification
W	Spiral
X	Elliptical
Y	Irregular
Z	Spiral

32. What evidence do astronomers use to detect black holes?
- By using the Hubble Space telescope.
 - By sending a probe into it and getting images back from it.
 - By observing and interpreting the spectra from the spectroscope.
 - By detecting X-rays coming from hot gas near the black hole and infer the presence of a black hole.

33. Based on spectral data for Element X, which of these stars contains Element X?



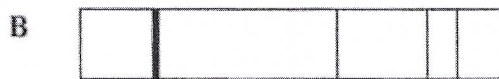
Element X



Star F



Star H



Star G



Star J

34. The Milky Way Galaxy is a/an
- Elliptical Galaxy
 - Normal Spiral Galaxy
 - Barred Spiral Galaxy
 - Irregular Galaxy
35. If a star is twice as massive as the sun, will it have a longer or shorter life than the sun?
- shorter
 - longer
36. How long a star lives and what it becomes at the end of its life depend primarily on it's _____.
- temperature
 - brightness
 - mass
 - magnitude
37. One piece of evidence that supports the big bang theory is the observation that most galaxies are moving
- toward our galaxy.
 - toward one another.
 - in random.
 - away from one another.
38. Reflecting telescopes differ from refracting telescopes in having
- no eyepiece lens.
 - two large objective lenses.
 - a mirror instead of an objective lens.
 - one large objective lens.

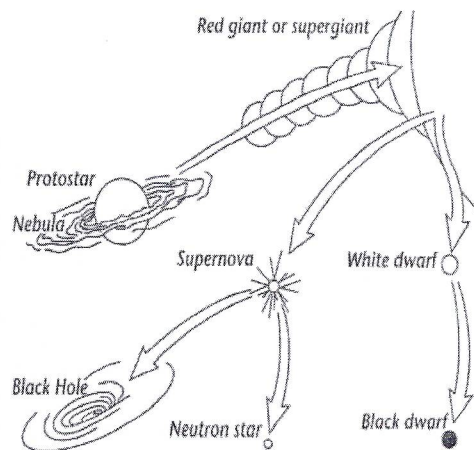
39. The picture shows sand used to make a model of a galaxy. In the model, each grain of sand best represents —



- A. a comet. B. a black hole. C. an asteroid. D. a star.

40. Describe the route that our star will take through its life cycle:

- A. protostar, nebula, supergiant, supernova, black hole
 B. nebula, protostar, supergiant, supernova, black hole
 C. nebula, protostar, red giant, white dwarf, black dwarf
 D. protostar, nebula, red giant, white dwarf, black dwarf



41. The Hubble Space Telescope

- A. is located at the top of Mauna Kea.
 B. is a refracting telescope.
 C. is part of the Chandra X-ray Observatory in space.
 D. collects visible light from above Earth's atmosphere.

42. A light-year is

- A. 365 days.
 B. the distance light travels in a year.
 C. the distance from Earth to Proxima Centauri.
 D. the amount of light the sun produces in a year.

43. Which of these instruments should you use to view Proxima Centauri, the nearest star other than the sun?

- A. Magnifying glass. B. Binoculars.
 C. Microscope. D. Telescope.

44. Proxima Centauri is 4.3 light years away from Earth. If astronomers shined a beam of laser light from Earth, how long would it take to reach Proxima Centauri?

- A. 4.3 light years B. 3.4 years.
 C. 4.5 years. D. 4.3 years.

45. Name five sizes of stars, in order from largest to smallest.
- Supergiant star, giant star, medium-sized star, white dwarf star, neutron star
 - Supergiant star, giant star, medium-sized star, neutron star, white dwarf star
 - Supergiant star, giant star, neutron star, medium-sized star, white dwarf star
 - Supergiant star, giant star, white dwarf star, medium-sized star, neutron star
46. Use the figure below to answer this question.

WHITE DWARF	SUPERGIANT	GIANT	NEUTRON STAR	MEDIUM-SIZED STAR
-------------	------------	-------	--------------	-------------------

Which of the following contains the group above?

- Asteroid
- Planet
- Supernova
- Galaxy

Use the data table to answer questions 47- 49.

PLANET	DISTANCE FROM SUN (millions of km)	PERIOD OF REVOLUTION	PERIOD OF ROTATION	SURFACE GRAVITY (compared to Earth)	ORBITAL VELOCITY (km/sec)
Mercury	7.9	88 days	59 days	0.38	47.8
Venus	108.2	224.7 days	243 days	0.91	35.0
Earth	149.2	365.24 days	24 hours	1.00	29.8
Mars	227.9	687 days	25 hours	0.38	24.2
Jupiter	778.3	11.86 years	10 hours	2.53	13.1
Saturn	1,427.0	29.46 years	12 hours	1.07	9.7
Uranus	2,871.0	84 years	17 hours	0.92	6.8
Neptune	4,497.0	165 years	16 hours	1.18	5.4
Pluto	5,914.0	248 years	7 days	0.09	4.7

47. Which statement is supported by the data?
- As its distance from the Sun increases, a planet's orbital velocity increases.
 - As its distance from the Sun increases, a planet's orbital velocity decreases.
 - As its distance from the Sun increases, a planet's orbital velocity remains the same.
 - There is no pattern between a planet's distance from the Sun and its orbital velocity.
48. If a 500g object is taken from the Earth to Saturn, the object's-
- mass will stay the same but its weight will be more.
 - mass will increase but its weight will stay the same.
 - mass and weight will both increase.
 - mass will stay the same but its weight will be less.

Remember, use the data table on the previous page (above question #47) to answer question #49 below:

49. If Earth moved closer to the Sun, its orbital velocity would have to-

- A. increase.
- B. decrease.
- C. stay the same.
- D. slow down, then speed up.

50. Scientists have used different kinds of evidence to estimate the age of the universe. Which of the following is the current best estimate of how long ago the universe formed?

- A. 10 to 12 million years ago
- B. 60 to 65 million years ago
- C. 13 to 15 billion years ago
- D. 20 to 25 trillion years ago