Name: _____

Date: _____ Period: _____

Modern Astronomy

Practice Test

Note: For each statement or question, choose the word or expression that best completes the statement or answers the question. Some questions may require the use of the 2011 Earth Science Reference Tables.

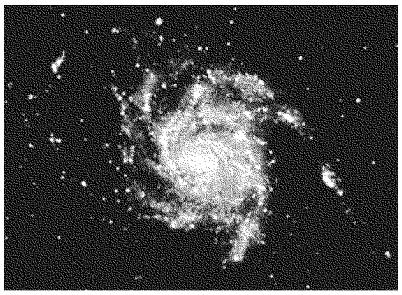
1) The approximate age of the universe is estimated to be

1) 4.6 billion years 2) 4.6 million years 3) 13.8 million years 4) 13.8 billion years

2) In which sequence are the celestial objects correctly listed in order from the *smallest* mass to the *largest* mass?

1) Milky Way, universe, solar system, Saturn
2) Saturn, universe, Milky Way, solar system
3) Milky Way, Saturn, solar system, universe
4) Saturn, solar system, Milky Way, universe

3) The photograph below shows a feature of the universe as seen through a telescope.



This feature is *best* identified as

1) a star 2) a galaxy 3) an asteroid 4) a comet

4) Compared to Earth's solar system, the universe is inferred to be

1) younger and larger 2) older and larger 3) younger and smaller 4) older and smaller

5) Which of the following objects forms by the contraction of a large sphere of gases causing the nuclear fusion of lighter elements into heavier elements?

1) star 2) comet 3) planet 4) moon

6) Compared to the Sun, the star *Betelgeuse* is

1) more luminous and cooler
2) less luminous and warmer
3) less luminous and cooler
4) more luminous and warmer

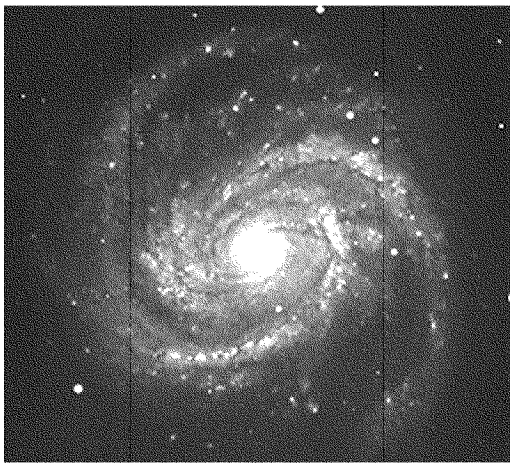
7) Which object in space emits light because it releases energy produced by nuclear fusion?

1) Venus 2) Halley's comet 3) *Polaris* 4) Earth's Moon

8) Which list shows stars in order of increasing temperature?

1) *Procyon B*, *Alpha Centauri*, *Polaris*, *Betelgeuse*
2) *Aldebaran*, the *Sun*, *Rigel*, *Procyon B*
3) *Barnard's Star*, *Polaris*, *Sirius*, *Rigel*
4) *Rigel*, *Polaris*, *Aldebaran*, *Barnard's Star*

9) The diagram below represents the shape of the Milky Way Galaxy.



The Milky Way Galaxy is *best* described as

1) spiral 2) irregular 3) circular 4) elliptical

10) Light from distant galaxies most likely shows a

1) red shift, indicating that the universe is expanding
2) blue shift, indicating that the universe is contracting
3) red shift, indicating that the universe is contracting
4) blue shift, indicating that the universe is expanding

11) Which star is hotter, but less luminous, than *Polaris*?

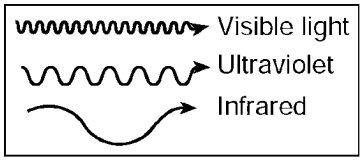
1) *Pollux* 2) *Sirius* 3) *Aldebaran* 4) *Deneb*

12) A blue shift of the light from a star indicates that the star

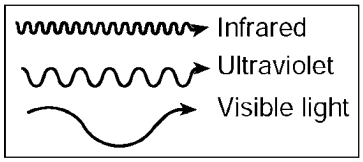
1) is moving away from Earth
2) is moving closer to Earth
3) will soon become a main sequence star
4) will soon become a giant star

13) Which diagram *best* represents the relative wavelengths of visible light, ultraviolet energy, and infrared energy?

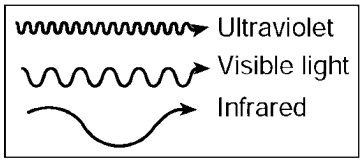
1)



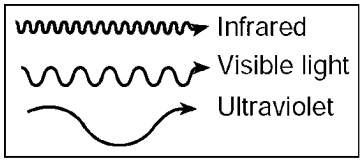
2)



3)



4)



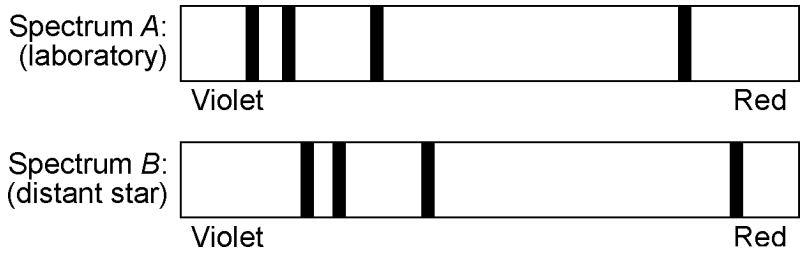
14) Which information best supports the inference that the universe began with an explosion?

1) calculations of the distance from the Sun to each asteroid in the asteroid belt
2) calculations of the temperature and luminosity of stars
3) measurements of cosmic background radiation
4) measurements of rates of decay using carbon-14

15) What are two pieces of evidence that support the Big Bang Theory?

1) planetary motion and the different shapes of galaxies
2) red shift of light and the different shapes of galaxies
3) planetary motion and cosmic background radiation
4) red shift of light and cosmic background radiation

16) The diagram below represents the light spectra given off by the same element as observed under two different conditions. Spectrum *A* was observed when that element was heated in a laboratory. Spectrum *B* shows the same element as seen in the light from a distant star.



The light spectrum observed from this distant star shows a

1) red shift, which indicates that the star is moving toward Earth
2) blue shift, which indicates that the star is moving toward Earth
3) blue shift, which indicates that the star is moving away from Earth
4) red shift, which indicates that the star is moving away from Earth

17) Which star is more massive than our Sun, but has a lower surface temperature?

1) *Sirius* 2) *Aldebaran* 3) *Barnard's Star* 4) *40 Eridani B*

18) Which color of visible light has the *shortest* wavelength?

1) yellow 2) violet 3) green 4) red

19) Which form of electromagnetic energy has the *longest* wavelength?

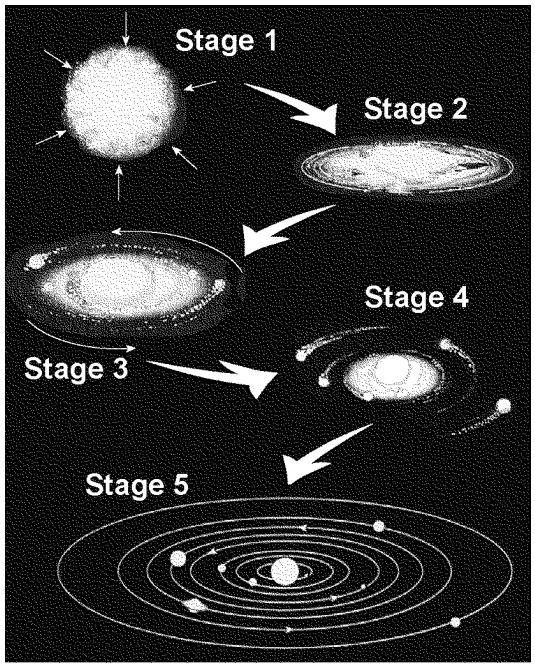
1) radio waves 2) ultraviolet rays 3) gamma rays 4) visible light

20) Which type of electromagnetic radiation has the *shortest* wavelength?

1) gamma rays 2) radio waves 3) visible light 4) ultraviolet

Questions 21 and 22 refer to the following:

The diagram below represents the inferred stages in the formation of our solar system. Stage 1 shows a contracting gas cloud. The remaining stages show the gas cloud flattening into a spinning disk as planets formed around our Sun.



(not drawn to scale)

21) Which force was mostly responsible for the contraction of the gas cloud shown?

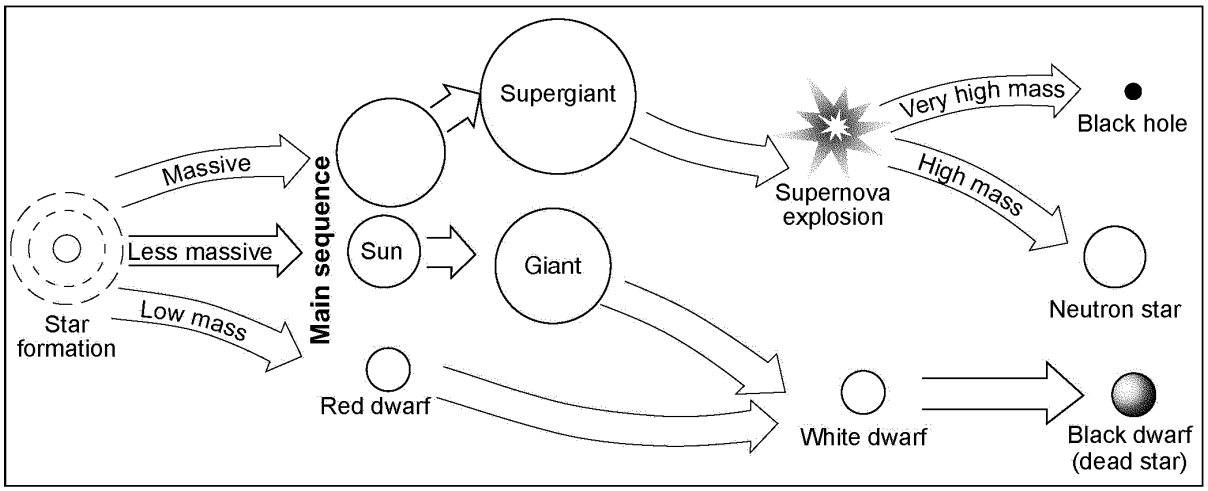
1) inertia 2) magnetism 3) friction 4) gravity

22) Which process was occurring during some of the given stages that resulted in the formation of *heavier* elements from *lighter* elements?

1) radioactive decay 2) conduction 3) nuclear fusion 4) radiation

Questions 23 through 25 refer to the following:

The diagram below represents some of the inferred stages in the life cycle of stars according to their original mass.



(Not drawn to scale)

23) Energy is produced in the cores of main sequence stars when

1) cosmic background radiation is absorbed
2) heavier elements undergo fusion into lighter elements
3) lighter elements undergo fusion into heavier elements
4) cosmic background radiation is released

24) Which star may once have been similar to our Sun in mass and luminosity?

1) *Proxima Centauri* 2) *Spica* 3) *Deneb* 4) *Procyon B*

25) The final stage in the life cycle of the most massive stars is a

1) black hole 2) white dwarf 3) black dwarf 4) supergiant