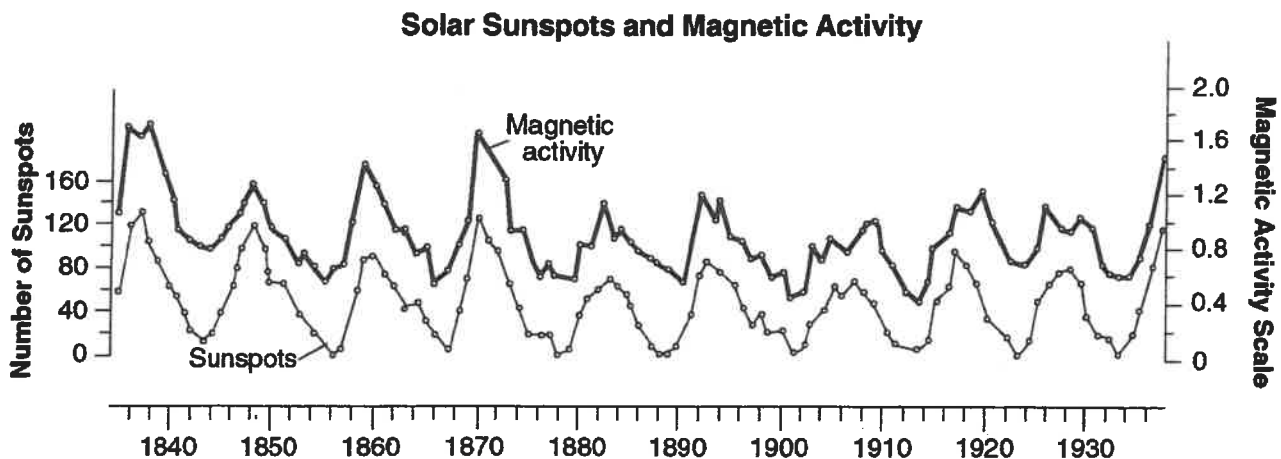


ASTRONOMY TEST PART B: SUN, STARS, AND STELLAR EVOLUTION

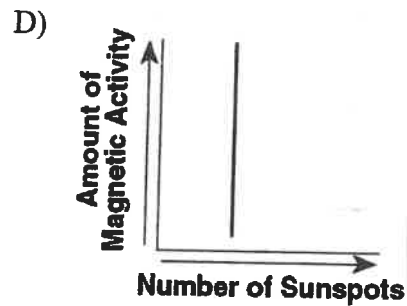
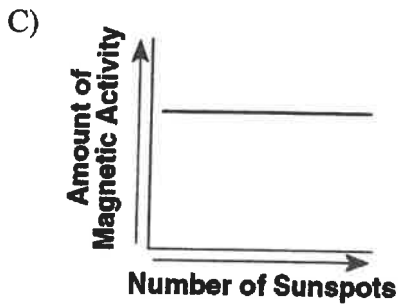
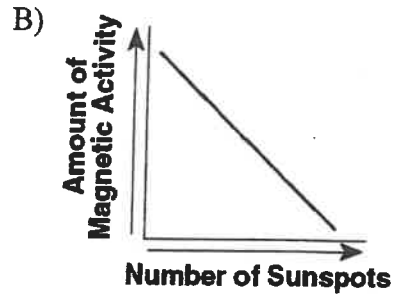
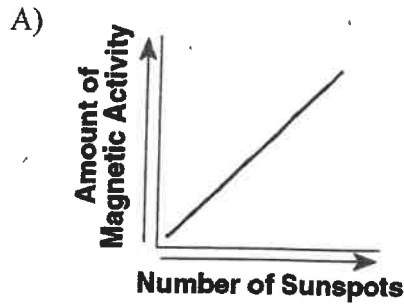
1. Which object forms by the contraction of a large sphere of gases causing the nuclear fusion of lighter elements into heavier ones.
 - a. Comet
 - b. Planet
 - c. Star
 - d. Moon
2. Where has the process of nuclear fusion been occurring for the past 4.5 billion years?
 - a. Earth's Inner Core
 - b. Surface of the Moon
 - c. Lithospheric Plate Boundaries
 - d. Sun's Interior
3. Great amounts of energy are released in the core of a star as lighter elements combine to form heavier elements during the process of ...
 - a. Compaction
 - b. Condensation
 - c. Radioactive Decay
 - d. Nuclear Fusion

Base your answers to questions #4 and #5 on the graph below. It shows the changes in magnetic activity and changes in the number of sunspots over the past 100 years.



4. The graph indicates that the years having the greatest number of sunspots occur
 - a. Randomly and Unpredictably
 - b. Precisely at the start of each decade
 - c. In a pattern repeating every 6 years.
 - d. In a pattern repeating every 11 years

5. Which graph indicates the relationship between the number of sunspots and the amount of magnetic activity in the sun?



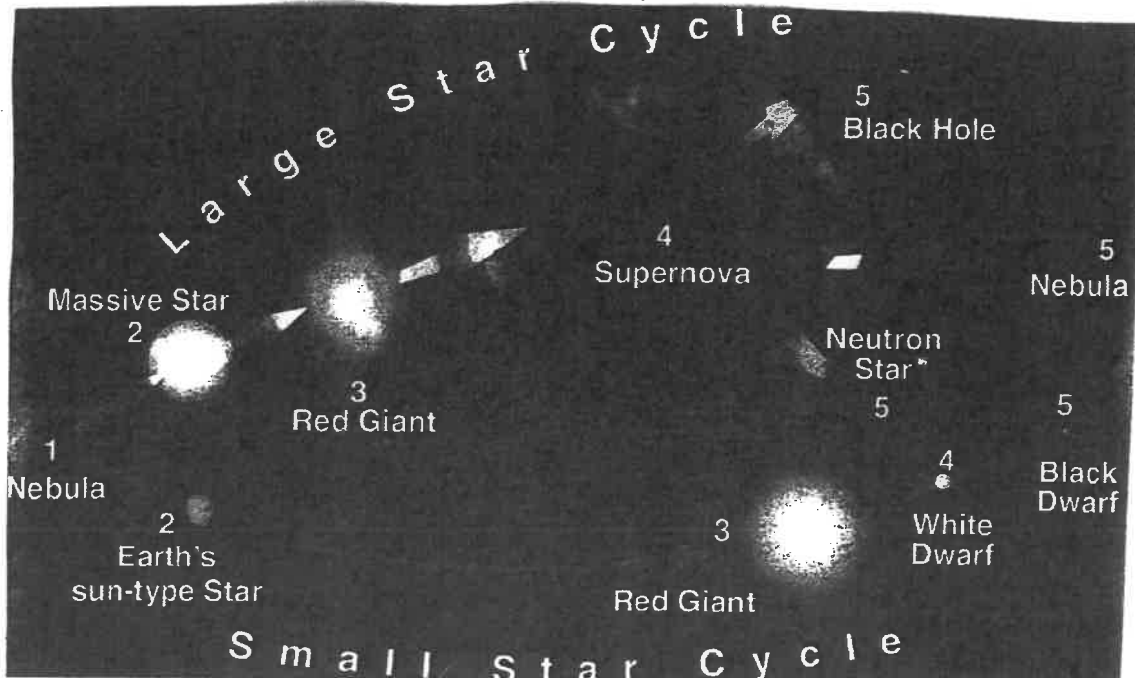
6. The reaction below represents an energy producing process.



This reaction represents how energy is produced ...

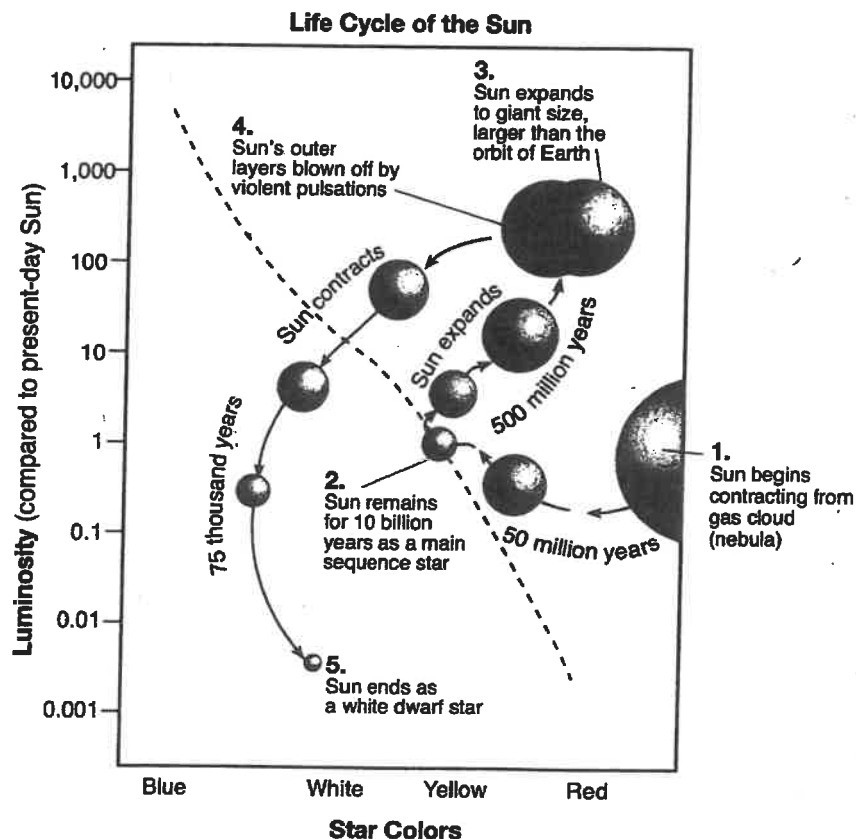
- In the Sun By Nuclear Fusion
- When water condenses in the Earth's atmosphere
- From the movements of binary stars in space
- During nuclear decay

Base your answers to #7, #8 and #9 on the diagram below. It shows 2 basic life cycles of stars, beginning with the formation from nebular clouds in space.



7. According to the diagram, the life cycle path of a star is determined by its initial...
- Mass and Size
 - Temperature and Origin
 - Luminosity and Color
 - Luminosity and Structure
8. Stars like Earth's sun most likely formed directly from a...
- Nebula
 - Supernova
 - Red Giant
 - Black Dwarf
9. According to the diagram, a star like Earth's Sun will eventually ...
- Explode in a Supernova
 - Become a Black Hole
 - Change into a White Dwarf
 - Become a Neutron Star
10. By which process does starlight travel through space?
- Absorbtion
 - Conduction
 - Convection
 - Radiation

This diagram represents the inferred changes to the luminosity and color of the sun through its life cycle. The diagonal dashed line represents the main sequence stars. Numbers 1- represent stages in the life cycle of the sun. Use it to answer the questions that follow.



11. The sun is most luminous when it is classified as a
- White Dwarf Star
 - Gas Cloud Nebula
 - Main Sequence Star
 - Red Giant Star
12. Where will the sun spend most of its life cycle?
- Contracting as a Nebular Cloud
 - As a Main Sequence Star
 - Moving away from a Main Sequence and Turning Red
 - Changing from a giant star into a White Dwarf
13. To an observer on Earth here, the sun appears brighter than the star "Rigel" because the sun is ...
- Hotter than Rigel
 - More Luminous than Rigel
 - Closer than Rigel
 - Larger than Rigel
14. During a full solar eclipse, you can see which layer of the sun?
- Sunspots
 - Corona
 - Solar Winds
 - Nothing because the sun is blocked out.
15. What astronomical activity most effects radio communication and other electromagnetic changes for us on Earth?
- Solar Eclipses
 - Solar Flares
 - Meteorites entering our atmosphere
 - Lunar Eclipses
16. As the sun ages, it will be composed of
- More H and less He
 - More He and less H
 - More O and less C
 - Less O and more C
17. What is the fuel of the sun and stars?
- H
 - He
 - Hydrocarbons
 - C

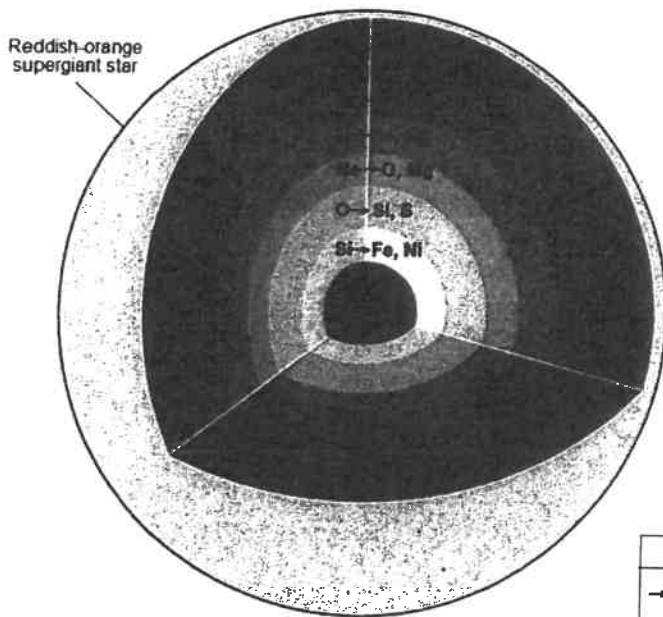
18. The most observable phenomena in the solar cycle is the appearance of ...

- a. Solar Eclipses
- b. Sun Spots
- c. Solar Storms
- d. Black Holes

19. Patterns of Sun-Spots are closely related to the pattern of the suns ...

- a. Corona
- b. Period of Rotation
- c. Magnetic Field
- d. Changing Size

Look at the cross section of the sun below. The picture shows a ss sectional model of a super-giant star. The layers in the model indicate what new chemical elements are being formed as the result of changing compositions, temperatures and pressures as you move deeper into a star. Use it to answer the question under it.



(Not drawn to scale)

Key	
→	Combines to form

Elements in the Star

Chemical Symbol	Name
H	hydrogen
He	helium
C	carbon
O	oxygen
Ne	neon
Mg	magnesium
Si	silicon
S	sulfur
Fe	iron
Ni	nickel

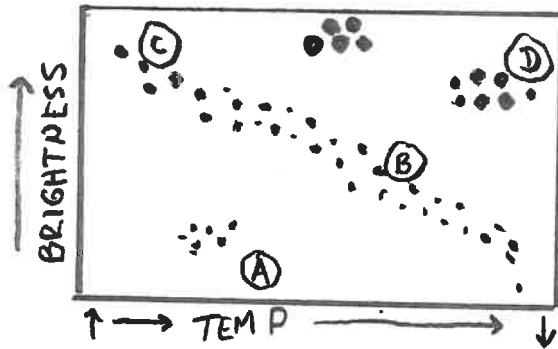
20. Which process represented in the model is occurring in each layer of this star to produce the new chemical elements.

- a. Contact Amorphism
- b. Internal Crystallization
- c. Nuclear Fusion
- d. Radioactive Decay

21. Which star color indicates the hottest star surface temperature?

- a. Blue
- b. White
- c. Yellow
- d. Red

22. The graph below represents the brightness and temperature of stars visible from earth. What location on the graph best represents a star with medium brightness and temperature



- a. A
- b. B
- c. C
- d. D

23. Measurements indicate that a certain star has a very high luminosity (100,000 times that of our sun) and yet has a temperature that is cooler than the sun. What can you conclude from this observation?

- a. It could be a main sequence star.
- b. It may be quite large
- c. This is a typical characteristic of stars.
- d. There must be an error in measurement.

24. Compared to other stars, the sun is...

- a. Among the hottest stars
- b. Among the smallest stars
- c. Very unique
- d. About average in all respects.

25. Which of the following stars is least bright?

- a. The sun
- b. A blue supergiant
- c. A white dwarf
- d. A red giant

26. Compared to the sun, a white dwarf star is...

- a. Hotter and larger
- b. Hotter and smaller
- c. Cooler and larger
- d. Cooler and smaller

27. The **apparent** brightness of an object such as a star does not depend on...
- How fast the star is moving
 - The strength of the light emanating from the star
 - The distance from us to the star
 - The amount and kind of obstacles between us and the star.
28. Compared to the sun, stars near the top of the H-R diagram are always...
- About the same brightness.
 - Over 10,000 times brighter
 - Much redder
 - Much hotter
29. In the H-R diagram, 90 percent of all stars fall...
- In the Red Dwarf region
 - In the Supergiant region
 - Among the White Dwarfs
 - On the Main Sequence
30. Two stars of the same color are plotted on an H-R diagram. Star A is more luminous than star B. Which one of the following statements could explain this?
- Star A is hotter than star B
 - Star A is more distant than star B
 - Star A appears brighter in the sky than star B
 - Star A is larger than star B
31. We know that red giant stars are larger in diameter than the sun because
- They are brighter but have the same temperature.
 - They are less bright but have the same temperature
 - They are hotter but have the same brightness
 - They are cooler but have the same brightness
32. In order to position a star on an H-R diagram, you must know at least the star's
- Color and ~~absolute~~ **absolute** brightness
 - Color, apparent brightness and distance
 - Apparent brightness and age
 - Color and distance
33. The vertical axis of an H-R diagram relates to the
- Color of the star
 - Absolute magnitude of the star
 - Apparent magnitude of the star
 - Speed of the star

34. Giant stars have greater luminosity than our sun mainly because they are
- Hotter
 - Farther away
 - Larger
 - Older
35. Which of the following stars is hottest?
- A red giant
 - A white dwarf
 - The sun
 - A red dwarf
36. Small cool stars would most likely appear to be
- Blue
 - Red
 - Yellow
 - White
37. Which factor does not affect a star's absolute magnitude(Luminosity)?
- The star's temperature
 - The star's size
 - The star's distance
 - The star's shape
38. An astronomer can tell the temperature of a star by observing its
- Size
 - Shape
 - Color
 - Brightness
39. During which stage of development does a star have a cool surface temperature and the greatest luminosity?
- Protostar
 - Main sequence
 - Red giant
 - White Dwarf
40. What are the two most abundant elements in a main sequence star?
- Carbon and hydrogen
 - Hydrogen and helium
 - Helium and carbon
 - Carbon and heavy metals

41. Which stars are the youngest?

- a. Supergiant
- b. White dwarf
- c. Blue star
- d. Red dwarf

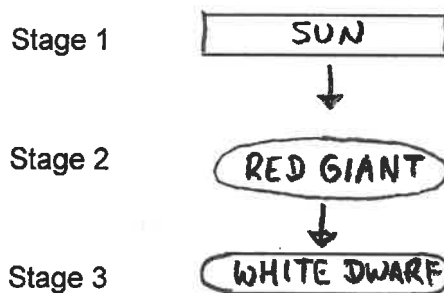
42. The explosion of a massive star near the end of its life is known as a

- a. Nova
- b. Supernova
- c. Pulsar
- d. Nebula

43. By using a spectroscope, an astronomer can

- a. Measure the size of a star
- b. Measure the altitude of a star
- c. Identify elements in the atmosphere of a star
- d. Measure the diameter of a star.

44. Stars are believed to undergo evolutionary changes over millions of years. The flowchart below shows stages of predicted changes in the sun.



According to this flow chart, the sun will become...

- a. Hotter and brighter in stage 2 then cooler and dimmer in stage 3
- b. Cooler and dimmer in stage 2 then hotter and brighter in stage 3
- c. Hotter and dimmer in stage 2 then cooler and brighter in stage 3
- d. Cooler and brighter in stage 2 then hotter and dimmer in stage 3.

45. A black hole is a celestial feature believed to have a mass millions of times the mass of our sun and a diameter less than the diameter of Earth. An object of such high mass and small volume would have

- a. A very low density
- b. A very high density
- c. An elliptical orbit with the sun at one focal point
- d. An elliptical orbit with Earth at one focal point