Instructions

- You have 20 minutes to complete this test.
- You may write your answers directly in the test.
- You may use any notes or resources you have created or collected.
- You may use a calculator and scratch paper if necessary.
- Good Luck!

Test Questions

1. How many total DSO's are there in the image above?
   a. 0
   b. 5
   c. 25
   d. 30

2. What is the name of the star in the left-most constellation in the image above?
   a. Antares
   b. Capella
   c. Pollux
   d. Sirius
3. What is the evolutionary stage of the star in the left-most constellation in the image above?
   a. Giant
   b. Main Sequence Star
   c. Red Dwarf
   d. Super Giant

4. What is the next most likely stage in the evolution of Pollux?
   a. Main Sequence
   b. Red Dwarf
   c. Super Giant
   d. White Dwarf

5. What most likely is causing Image 2 to move through space at an abnormally high velocity?
   a. The proximity of a black hole
   b. It’s transitioning from a Main Sequence Star
   c. The explosion of its binary propelled the star
   d. Gravitational attraction of a nearby constellation

6. What is this constellation shown in Image 3 named after in Greek Mythology?
   a. Castor
   b. Medusa
   c. Orion
   d. Sphinx
7. Which star in image 4 has the greatest brightness as measured from earth?
   a. Arcturus  
b. Deneb  
c. Vega  
d. Procyon

Use the Following Image for Questions #8 through #18
8. How should Section A in the unlabeled H-R diagram shown above be labelled?
   a. Giants
   b. Main Sequence
   c. Supergiants
   d. White Dwarf

9. How should Section B in the unlabeled H-R diagram shown above be labelled?
   a. Giants
   b. Main Sequence
   c. Supergiants
   d. White Dwarf

10. How should Section C in the unlabeled H-R diagram shown above be labelled?
   a. Giants
   b. Main Sequence
   c. Supergiants
   d. White Dwarf

11. How should Section D in the unlabeled H-R diagram shown above be labelled?
   a. Giants
   b. Main Sequence
   c. Supergiants
   d. White Dwarf

12. In what region on the H-R diagram would you find the Sun?
   a. Giants
   b. Main Sequence
   c. Supergiants
   d. White Dwarf

13. Where in a H-R diagram are you more likely to find bluer stars?
   a. Left Side
   b. Middle Band
   c. Right Side
   d. Top Band

14. What is the definition of Absolute Magnitude?
   a. brightness of an object in space
   b. how bright the star appears from Earth
   c. the amount of energy that a star emits from its surface
   d. how bright the star appears at a standard distance of 32.6 light-years

15. Where on the diagram would you find Vega?
   a. Bottom-left
   b. Bottom-right
   c. Middle
   d. Top-left
   e. Top-right
16. Where on the diagram would you find Spica?
   a. Bottom-left
   b. Bottom-right
   c. Middle
   d. Top-left
   e. Top-right

17. Where on the diagram would you find Altair?
   a. Bottom-left
   b. Bottom-right
   c. Middle
   d. Top-left
   e. Top-right

18. Where on the diagram would you find the companion star of Sirius
   a. Bottom-left
   b. Bottom-right
   c. Middle
   d. Top-left
   e. Top-right

19. What is the name of a region of interstellar atomic hydrogen where star formation is taking place?
   a. An Elliptical
   b. A H II region
   c. The Main Sequence
   d. A Stellar Incubator

20. What type of galaxies mainly consist of older stars and have minimal star formation?
   a. Barred Spiral
   b. Elliptical
   c. Irregular
   d. Spiral

21. What is the part of a galaxy where globular clusters are typically located?
   a. Galactic Disk
   b. Halo
   c. Nucleus
   d. Spiral Arm

22. Who created the first galaxy classification scheme?
   a. Galileo Galilei
   b. Edwin Hubble
   c. Carl Sagan
   d. Neil deGrasse Tyson

23. What stars do not get hot enough to reach nuclear fusion in their cores?
   a. Black Dwarfs
   b. Brown Dwarfs
   c. Red Dwarfs
   d. White Dwarfs
24. What is its apparent magnitude of a galaxy that is 100,000 parsecs away and has an absolute magnitude of 15?
   a. 15
   b. 20
   c. 35
   d. 45

25. What term describes the relationship between the luminosity and rotational velocity of a spiral galaxy?
   a. Cepheid Distances
   b. Faber-Jackson Concordance
   c. Fundamental Plane
   d. Tully-Fisher Relation

Use the following information to answer Questions #26 through #30.

**Star A has a luminosity L and temperature T. Star B has luminosity 2L and temperature 2T.**

26. Write an expression using these variables and the Stefan-Boltzmann constant σ to solve for the radius of star A.

27. Given that L = 4x10^28 W, T = 8000K, and σ = 5.67x10^-8 W/m²/K⁴, solve for the radius of star A in meters.

28. At what wavelength in nanometers will star A have peak blackbody radiation?

29. How much larger is the radius of star B than star A (answer should have up to 3 significant figures)?

30. Given that the luminosity of the sun is 3.83x10^26 W and its absolute magnitude is 4.83, what is the absolute magnitude of star B using the L value given in question 27?
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1. | B | 15. | E | 29. | 0.354 times larger |
| 2. | A | 16. | D | 30. | -0.97 |
| 3. | D | 17. | C |
| 4. | D |
| 5. | C |
| 6. | C |
| 7. | A |
| 8. | C |
| 9. | A |
| 10. | B |
| 11. | D |
| 12. | B |
| 13. | A |
| 14. | D |
| 15. | E |
| 16. | D |
| 17. | C |
| 18. | A |
| 19. | B |
| 20. | B |
| 21. | B |
| 22. | B |
| 23. | B |
| 24. | C |
| 25. | D |
| 26. | R = \sqrt{\frac{L}{4\pi\sigma T^4}} (2) |
| 27. | 3.70 \times 10^9 m |
| 28. | 362 nm |