

ANSWER ALL THE QUESTIONS. THE WORTH OF EACH QUESTION IS IN () AFTER THE QUESTION.

1. (10) Fill in the following for two stars (excluding the sun)

NAME	IN WHICH CONSTELLATION	ABSOLUTE MAGNITUDE	APPARENT MAGNITUDE	DISTANCE FROM EARTH	SPECTRAL CLASS
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_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

2. (16) Draw an H-R diagram, labeling both axes and indicating where the main sequence, giants, supergiants and white dwarfs are located. Also, place the sun and the two stars of problem #1 on the diagram.



3. (a) (2) What is a sunspot?

(b) (3) How big is a sunspot?

(c) (3) How long does a sunspot cycle usually last?

4. (6) Name and briefly describe two ways distances to the stars are determined.

1.

2.

5. (6) Name and briefly describe two of the ways of detecting binary stars:

1.

2.

6. (5) Why are binary stars important (i.e., how do they help us determine stellar properties) ?

7. (3) a) Distinguish between brightness and luminosity:

(3) b) Distinguish between apparent magnitude and absolute magnitude:

8. (9) Name three possible ways a star will end up after it has finished burning its fuel:

1.

2.

3.

9. (4) What property of a star determines which of the above ways that star will end up?

10. (3) What is a Cepheid variable star?

(3) Why is this type of star important?

11. (10) Draw another H-R diagram, labeling the axes and showing the position of the main sequence, and then draw in the life cycle of a star like the sun, and explain what is happening at each stage of the cycle.



12. a) What is a black hole? (2)

b) When is a black hole formed? (2)

13. TRUE or FALSE: (+1 points each if correct, 0 if left blank, -1 if wrong)
(or subtracting from 100: -0 if correct, -1 if blank, -2 if wrong)

[In the questions below, the word 'about' means within a factor of 2 either way.]

F a) The diameter of the sun is about **10%** of the earth-sun distance.

T b) Only the lighter elements, like carbon and oxygen, are made in the interior of stars.
Elements heavier than iron are not.

F c) The nearest star is about 250,000 **miles** away from the earth.

F d) Vega is a star that has a stellar classification of A0 V. From this we can infer that Vega is **less** massive than the sun.

F e) **Open or galactic** star clusters have up to a million stars that are all old stars.

T f) Our sun will probably turn into a red giant star in about 5.5 billion years.

F g) Planetary nebula **eventually collapse and form planets**.

T h) A K9 Ia star has the same surface temperature as a K9 V star.

T i) More massive stars, even though they have more fuel, do not last as long on the main sequence as less massive stars because they burn their fuel so much faster.

T j) When our sun reaches the red giant stage, its surface will probably reach to the orbit of Venus.