Name: _____

Class: _____

Due Date: _____

E.5 Fusion and Stars

Understandings
o The stability of stars relies on an equilibrium between outward radiation pressure and inward gravitational forces.
o Fusion is a source of energy in stars.
o The conditions leading to fusion in stars in terms of density and temperature.
o The effect of stellar mass on the evolution of a star.
o The main regions of the Hertzsprung-Russell (HR) diagram and how to describe the main properties of stars in these regions.
o The use of stellar parallax as a method to determine the distance d to celestial bodies as given by $d(\text{parsec}) = \frac{1}{p(\text{arc-second})}$
o How to determine stellar radii

Equations

$$d(\text{parsec}) = \frac{1}{p(\text{arc-second})}$$

The solutions can be found on the YouTube channel Go Physics Go:

https://www.youtube.com/@gophysicsgo/playlists

Use your favorite sources to answer the following questions

1. Define *nuclear fusion.*

2. Give two examples of *nuclear fusion*:

3. Define *celestial.*

4. Define *star.*

5. Define *thermal gas pressure*.

6. Define *radiation pressure.*

7. Define *gravitational pressure.*

8. Define *stellar equilibrium*.

9. Define *main sequence star*.

10. Define *Sun*.

11. Describe the *proton-proton cycle*.

12. Define *apparent brightness b*. Units?

13. Define *luminosity L*. Units?

14. Define a *perfect black body*.

15. Describe *Wien's displacement law*.

16. Describe the *absorption spectrum*.

17. Describe *main sequence stars*.

18. Describe the *Hertzsprung-Russell diagram*.

19. Describe the *instability strip*.

20. Define a *red giant*.

21. Define a *red supergiant*.

22. Define a *dwarf star*.

23. Define *electron degeneracy pressure*.

24. Define a *white dwarf*.

25. Describe what happens after a *supernova*.

26. Describe the term *evolutionary path*.

27. Describe the equation $L \propto M^{3.5}$.

28. Define *astronomical unit*.

29. Define *light year*.

30. Define *stellar parallax* (or *parallax method*).

31. Define *parallax angle*.

32. Define *arc second*.

33. Define *parsec*.

34. Describe the equation $d(\text{parsec}) = \frac{1}{p(\text{arc−secon })}$.