NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SECOND EXAM

ASTR 1020 SECTION 001

MARCH 16, 2010

DO ALL 19 PROBLEMS.

MARK YOUR ANSWERS ON THIS SHEET AND TURN IT IN.

Each answer worth 5 points except last which is worth 10 points.

All constants in mks units unless otherwise specified:

c=3x108 G=6.7x10-11 h=6.6x10-34 =5.7x10-8 REarth=6400km

1pc=3x1016m 1AU=1.5x1011m M=2x1030kg R=7x108m

   F=ma  x=vt v=at

   

\_\_\_\_\_ 1) How big is a red supergiant? As big as:

a) a comet b) the Sun c) Mars orbit d) Jupiter e) Earth

\_\_\_\_\_ 2) What is the luminosity of a white dwarf with surface temperature equal to the Sun? (in solar luminosities)

a) 104 b) 102 c) 1 d) 10-2 e) 10-4

\_\_\_\_\_ 3) How long can a star run on gravity without nuclear fusion? (in years)

a) 1031 b) 1012 c) 1010 d) 107 e) 100

\_\_\_\_\_ 4) What element cannot be nuclear burned to release energy?

a) oxygen b) iron c) hydrogen d) uranium e) helium

\_\_\_\_\_ 5) Planetary nebulae are often shaped like a(n)

a) hourglass b) Frisbee c) basketball d) coke can e) ice cream cone

\_\_\_\_\_ 6) How long will Prox Centauri (M5 dwarf) spend on the main sequence? (years)

a) 1000 b) 106 c) 109 d) 1012 e) 1015

\_\_\_\_\_ 7) A White Dwarf star is comparable in size to

a) a comet b) the Sun c) Mars orbit d) Jupiter e) Earth

\_\_\_\_\_ 8) What is the density of a neutron star compared to that of water?

a) .001x b) 1x (comparable) c) 103x d) 106x e) 109x

\_\_\_\_\_ 9) How long will a neutron star survive if left alone? (years)

a) thousand b) million c) billion d) trillion e) forever

\_\_\_\_\_ 10) What carries the bulk of the energy out of a type II supernova explosion?

a) photons b) neutrinos c) blast wave d) gravity waves e) wires

11.When a star becomes a giant it gets redder. Why?

12. What is the Helium Flash?

13. What is the fate of the Earth as the Sun ages?

14. What is electron degeneracy?

15. What is a Nova?

16 What is an Accretion Disk?

17 What is the difference between a Type I and Type II Supernova?

18. What is a Pulsar?

19 (10 Points) Draw an HR Diagram. Label both axes. Draw the Main Sequence and show the position of the Sun. Show the path that a two solar mass star follows from proto-star to final resting point. Label what the star is called in each of its major stages.