Name: .....

ASTRONOMY 1102 - Section 1

Instructor: Juhan Frank

Spring 1999

Homework # 6 due Wed. Mar. 24

The evolution of Masive Stars: Supernovae

1) During the evolution of a massive star the following nuclear fuels are consumed by fusion at ever increasing temperatures and rates: H, He, C, O, Ne, Mg, Si, (see also table on handout) until an inert “iron” core forms with the ashes of the burning.

a) Sketch schematically the internal structure of that massive star just before core collapse

b) Look over the table of elements on page A-10, and locate all the fuels mentioned above. Do you notice a regular pattern? What is the cause of this pattern? BONUS: How come there is no S, Ar,Ca,Ti, Cr burning shells?

2) What is approximately the absolute magnitude of a SN of type I? Assuming the limiting magnitude of a 4m class telescope is 25; How far can we detect SN of type I with such a telescope?