Answer Sheet: Multiple Answer Questions must be entirely correct for credit.

1. SG	2.MS	3. G	4. WD
5. MS	6. MS	7. F	8. B
9. E	10. C	11. A	12. B
13. B,C, D	14. D	15. E	16. O,B,A,F,M
17. A	18. A	19. A,B, C, D	20. E
21. C	22. B	23. A,B,E	24. B
25. B,C	26. C	27. A	28. B
29. E	30. F		Total: /30

31. The Sun/Sol	32. Figure 3.
33. Figure 5	34. Figure 4
35. Figure 1	36. v=6400 m/s +-100m/s
37. d = 6.25 pc	38. d=199.5pc +-5pc
39. P=26.6y +-2y	40.Slow X-ray Pulsar
	Total: /20 This score is the second tiebreaker.

41. Star clusters contain large populations of star with similar ages, composition, and Distance. This allows astronomers to keep these variables constant and study the population.

Total: /5

42. The period of pulsation is directly related to luminosity.
Luminosity can be used to assign an absolute magnitude.
Using parallax, one can determine the distance t nearby Cepheid variables.
Cepheid variables that are further away can be used to estimate distances, bridging the Gap between measuring parallax and using type II supernovae.

Total: /5

School:_____ TeamNumber:_____

43. Brightest areas surround newly formed stars.
Light regions are ionized Hydrogen gas.
Dark regions contain interstellar dust.

Total: /5

44. The Rho Ophiuchi cloud complex is a dark nebula of interstellar gas and dust which is Roughly 130pc from Earth. It is one of the nearest star forming regions to Earth. A shock Wave coming from the direction of Scorpius/Centaurus seems to be fueling the ignition of New stars.

Total: /5

45. A star between 8-50 solar masses progressively fuses larger and larger elements. When the star begins to fuse iron, the reaction does not produce as much energy as it takes to Start the reaction. Fusion no longer counteracts gravity and the star begins to collapse. When the core's density reaches that of a degenerate neutron state, the outer layers bounce Off the core as they collide, creating a shockwave that propagates outward. Heavier than Iron elements are created by the shockwave. The core becomes a neutron star or a black hole Depending on the original mass of the star. The outer layers become an expanding shell of Plasma called a supernova remnant.

Total: /5

The sum of the essay scores is the first tiebreaker.

Total: /75

For any questions about scoring contact Andrew McQuiston (571)344-4618.