

2018 Captains Tryouts- Astronomy Key

All questions are worth 2 points each.

1.
  - a. IC 443
  - b. Neutron star
  - c. Pointing in a different direction than movement of object
2.
  - a. Alpha Orionis
  - b. Semiregular variable
  - c. 19
  - d. Bow shock
3.
  - a. 3
  - b. Luminous blue variable
  - c. 100 days
  - d. Red
4.
  - a. SN 1987A
  - b. Closest recorded supernova since invention of telescope
  - c. Ni-56
  - d. Collision of supernova ejecta with gas
5.
  - a. HR 5171 A
  - b. 18
  - c. Eclipsing binary
  - d. Roche lobe overflow
6.
  - a. 17
  - b. Tidal disruption
  - c. Kerr black hole
  - d. No Ni-56 observed
7.
  - a. 8
  - b. Pulsar Wind Nebula
  - c. Thought to be first radio-quiet pulsar
  - d. Radio
8.
  - a. Kappa Mechanism
  - b. Population I
  - c. Population II
  - d. 1.6 magnitudes brighter
9.
  - a. Elliptical, due to them exhausting star formation in their formations
  - b. Wolf-Rayet star
  - c. P Cygni profile
  - d. H and He
10.
  - a. CNO cycle

- b. Type II
  - c. Elliptical
  - d. Iron. Fusion of iron is endothermic.
  - e. Type II-p
- 11.
- a. Tolman-Oppenheimer Volkoff limit
  - b. Magnetar
  - c. Pulsar
12. In stars that are hotter, more of the Hydrogen is ionized, and which do not produce absorption lines. In stars that are cooler, there is less energy to excite Hydrogen atoms, so there are more H atoms in the ground state, which also do not produce absorption lines.
13. 1.66 Msol
- 14.
- a. -4.24
  - b. 1.772 MPc
15.  $5.06 \times 10^{12}$  seconds
- 16.
- a. 7250 angstroms
  - b. 54.1km/s
  - c. 19.0 km/s
  - d. 57.3 km/s
  - e. -0.66
  - f. 0.845
  - g. 26.6 Rsol
  - h. 0.05 arcseconds
  - i. Spectral class K
- 17.
- a. 40 km/s
  - b. 0.438 days
  - c. 230 km/s
  - d. 180 km/s
  - e. 3.16 Msol
  - f. 1.78 Msol
18. 298000 years
19. 10
20. 46 km/s
21. 0.25mW

## DSO IMAGE SHEET KEY

1. Alpha Orionis
2. AG Carinae
3. S Doradus
4. Circinus X-1
5. RCW 103 Composite
6. DEM L241 Optical
7. M82 X-2 Composite
8. Geminga PWN
9. NGC 6357 Infrared
10. SN 1987A
11. AG Carinae HST
12. PSR B0355+54 Chandra X-ray
13. Circinus X-1
14. SN W49B
15. Circinus X-1 X-ray
16. NGC 7822
17. ASASSN-15h
18. HR 5171 A
19. Alpha Orionis
20. IC 443