

NSO Astronomy C Event 2009 – Answer KEY Section A

1)

- a) **Betelgeuse**
- b) **Mira (semi-regular pulsating)**
- c) **K**
- d) **AA**
- e) **15 - 21 magnitudes fainter ($1.2 - 2.0 \times 10^{-7}$ as bright)**

2)

- a) **T**
- b) **contact binary**
- c) **red giant, white dwarf**
- d) **M**
- e) **BB**

3)

- a) **Omicron Ceti, Mira**
- b) **no flaring (no transfer of material)**
- c) **V, 300-350 days**
- d) **white dwarf, nothing**
- e) **B**

4)

- a) **semi-detached binary**
- b) **red giant, white dwarf, nebulosity**
- c) **W**
- d) **materials transfer due to stellar winds, not gravitational attraction**
- e) **black dwarf**

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5)

- a) E
- b) SN 1006, Type I supernova
- c) Type II supernova, core collapse
- d) main sequence massive (giant) star
- e) nothing, pulsar (neutron star)

6)

- a) .9 – 1.3 V
- b) RR Lyrae, U
- c) Cepheids
- d) globular clusters
- e) Period-Luminosity

7)

- a) Epsilon Aurigae
- b) P
- c) 1.2 – 2.2 yrs
- d) secondary is a large disk surrounding secondary
- e) 25 - 30 AU

8)

- a) Q
- b) X-ray binary
- c) neutron star, main sequence star, accretion disk
- d) 16 - 20 days
- e) the neutron star and MS star pass very close at periastron (closest in the orbit)

Score:

NSO Astronomy C Event 2009 – Answer KEY Section B

1) $1.5 - 2.5 \times 10^{17}$ m

2) $4.5 - 5.5 \times 10^{31}$ kg

3) $0.8 - 1.5 \times 10^6$ m/s

4) 10^3 order of magnitude

5) $7.0 - 8.0 \times 10^{16}$ m

6) $1.4 - 2.0 \times 10^7$ yrs

NSO Astronomy C Event 2009 – Answer KEY Section C

- 1) 5
- 2) 150 - 350 pcs
- 3) 2,000 – 3,000 pcs
- 4) 62,000 – 64,000 pcs
- 5) 115 - 125 nm
- 6) 3.3 – 3.7
- 7) 1 arc sec
- 8) 500 - 600 solar luminosities
- 9) 2000 - 3000 K
- 10) 0.4 – 1.2 solar radii
- 11) 0.1 – 0.5 solar masses
- 12) 2,000,000 to 3,000,000 light years
- 13) Star O
- 14) 9 - 11
- 15) - 50 – +50 days
- 16) 1
- 17) L1
- 18) 40 - 50 km/s
- 19) Star X
- 20) Star Y

TIE BREAKERS:

- 1) Highest Score Sec A page 1
- 2) Highest Score Sec A page 2
- 3) Highest Score Sec B
- 4) Highest Score sec C
- 5) Answers to the following questions in order: 2a, 4a, 6c, B 1, D 18