INSTRUCTIONS: Please, write your first and last name and Student ID on the Scantron sheet. Choose the letter of the response (by firmly marking the bubble on the Scantron with a PENCIL) that you think best answers the question. Do not rush your answer. Use of textbook and class notes is allowed.

**** Please, look on both sides of the sheet, there are a total of 10 questions. *****

1. Binary stars allow us to find the ________ of the stars.
   A. colors
   B. masses
   C. surface temperatures
   D. luminosities
   E. composition

2. If two stars have the same spectral type they must have approximately the same
   A. color
   B. mass
   C. surface temperature
   D. parallactic distance
   E. luminosity

3. To calculate a star radius you must know its
   A. chemical composition and temperature.
   B. color and chemical compositions.
   C. surface gravity and temperature.
   D. temperature and luminosity.
   E. chemical composition and luminosity.

4. If the size of an object doubles, but its temperature stays the same, the total amount of energy it emits will be
   A. the same
   B. two times larger
   C. four times larger
   D. eight times larger
   E. sixteen times larger

5. The source of energy of stars is
   A. gravitational collapse.
   B. the balance of force and pressure.
   C. nuclear fusion, which takes place in the center.
   D. nuclear fusion, which takes place in the radiative envelope.
   E. the extremely hot coronal gas.
6. If the temperature of an object triples, the total amount of energy it emits will be
   A. the same
   B. three times larger
   C. nine times larger
   D. twenty-seven times larger
   E. eighty-one times larger

7. If a star has half the temperature of our Sun, but has the same luminosity, how large is its radius compared to the Sun?
   A. half the radius of the Sun
   B. one quarter the radius of the Sun
   C. the same radius as the Sun
   D. twice the radius of the Sun
   E. four times the radius of the Sun

8. A 50-watt light bulb is 25 times more luminous than a 2-watt light bulb. The two will appear equally bright if:
   A. the 50-watt light bulb is located 125 times further away than the 2-watt light bulb
   B. the 50-watt light bulb is located 25 times further away than the 2-watt light bulb
   C. the 50-watt light bulb is located 5 times further away than the 2-watt light bulb
   D. the 2-watt light bulb is located 5 times further away than the 50-watt light bulb
   E. the 2-watt light bulb is located 25 times further away than the 50-watt light bulb

9. The most important characteristic of a star for determining its lifetime is
   A. radius
   B. luminosity
   C. distance from the main sequence
   D. mass
   E. temperature

10. If the Sun were to suddenly become a black hole, its radius would shrink by 200,000 times. The gravitational force felt by the Earth at its current distance would be:
    A. \((200,000)^2\) times stronger than now
    B. 200,000 times stronger than now
    C. \((200,000)^2\) times weaker than now
    D. 200,000 times weaker than now
    E. the same as now
SOLUTIONS:
1. B
2. C
3. D
4. C
5. C
6. E
7. E
8. C
9. D
10. E