

Name: _____ Date: _____
ASTRO 130, Fall 2018, Homework Chapter 16

1. How does the temperature of an interstellar cloud affect its ability to form stars?
 - A) Star formation is so complicated that it is not possible to say how one quantity, such as temperature, affects it.
 - B) Higher temperatures inhibit star formation.
 - C) Higher temperatures help star formation.
 - D) Star formation is independent of the temperature of the cloud.

2. The main factor which determines the rate at which a protostar evolves is its
 - A) initial mass, smaller masses evolving faster.
 - B) initial mass, larger masses evolving faster.
 - C) initial composition.
 - D) environment, protostars with binary companions evolving much faster.

3. At what point in its evolution will a protostar stop shrinking and stabilize into a star?
 - A) when nuclear processes generate enough energy and internal pressure to resist gravitational contraction
 - B) when contraction leads to an increase in spin rate as a result of the conservation of angular momentum and the resulting centrifugal force begins to oppose the gravitational contraction
 - C) when gravitational contraction has heated up the gas to the point where radiation pressure opposes gravity for the first time
 - D) when the buildup of helium in the core stops the nuclear furnace

4. At what stage of its evolutionary life is the Sun?
 - A) pre-main-sequence—variable star
 - B) main-sequence—middle age
 - C) post-main-sequence—red giant (cool) phase
 - D) just before supernova stage (perhaps 5 years)—late evolutionary stage

5. The stars in an open cluster are useful for studying the early stages of stellar evolution because all the stars in a cluster have the same
 - A) age.
 - B) spectral type.
 - C) luminosity class.
 - D) radius.

6. If a protostar were able to contract (get smaller) without any change to its surface temperature, what would happen to its luminosity?
- A) It would decrease, due to the smaller surface area of the protostar.
 - B) It would remain the same, because the temperature does not change.
 - C) It is not possible to predict the change in luminosity, because other factors are involved.
 - D) It would increase, due to the compression of the gas.
7. Which range of electromagnetic radiation is useful for observing new-born protostars within their gas and dust nebulas?
- A) visible
 - B) UV
 - C) X-rays
 - D) infrared
8. Giant molecular clouds of H₂ and CO gas are found in which regions of our galaxy?
- A) They appear to be uniformly spread throughout the galaxy, both in the spiral arms and above and below them.
 - B) above and below the plane of the spiral arms, over the galactic poles
 - C) at the center of the galaxy
 - D) along the spiral arms
9. Which of the following easily observed molecular species is used as a tracer for the fundamental but difficult-to-observe H₂ molecules in giant molecular clouds?
- A) H₂O
 - B) CO
 - C) OH
 - D) CO₂