**Galaxies**

**Multiple Choice**

*Identify the letter of the choice that best completes the statement or answers the question.*

\_\_\_\_ 1. An E galaxy contains

|  |  |
| --- | --- |
| a. | mostly lower-main sequence stars and giants. |
| b. | mostly upper main sequence stars and giants. |
| c. | mostly upper main sequence stars and gas and dust. |
| d. | roughly equal numbers of upper and lower main sequence stars. |
| e. | mostly white dwarfs and supergiants. |

\_\_\_\_ 2. An irregular galaxy contains

|  |  |
| --- | --- |
| a. | mostly lower-main sequence stars and giants. |
| b. | mostly upper main sequence stars and giants. |
| c. | mostly upper main sequence stars and gas and dust. |
| d. | upper and lower main sequence stars and gas and dust. |
| e. | mostly white dwarfs and supergiants. |

\_\_\_\_ 3. A megaparsec is equivalent to

|  |  |
| --- | --- |
| a. | 3.26 light-years |
| b. | 206,265 light years |
| c. | 206,265 AU |
| d. | 3,260,000 light-years |
| e. | the diameter of the Milky Way galaxy. |

\_\_\_\_ 4. Which of the following is not used as a distance indicator?

|  |  |
| --- | --- |
| a. | large globular clusters |
| b. | Herbig-Haro objects |
| c. | H II regions |
| d. | Cepheid variable stars |
| e. | Supernovae |

\_\_\_\_ 5. The look-back time is

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| --- | --- |
| a. | how long the light from an object takes to reach Earth. |
| b. | numerically equal to the distance in light-years. |
| c. | smaller for more distant objects. |
| d. | all of the above |
| e. | a and b above |

\_\_\_\_ 6. The mass of a single galaxy might be found by

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| a. | the double galaxy method. |
| b. | the rotation curve method. |
| c. | the cluster method. |
| d. | any of these methods. |
| e. | none of these methods. |

\_\_\_\_ 7. If H equals 50 km/sec/Mpc, then a galaxy with a radial velocity of 2000 km/sec probably has a distance of

|  |  |
| --- | --- |
| a. | 2050 Mpc |
| b. | 1950 Mpc |
| c. | 40 Mpc |
| d. | 0.025 Mpc |
| e. | 100,000 Mpc |

\_\_\_\_ 8. Galactic cannibalism refers to

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| a. | binary galaxies. |
| b. | the merging of galaxies. |
| c. | galaxies drawing in gas from the intergalactic medium. |
| d. | the destruction of a galaxies globular clusters by the galaxies nucleus. |
| e. | none of these |

\_\_\_\_ 9. We should expect galaxies to collide with each other fairly often because

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| --- | --- |
| a. | a galaxy's size is only a little smaller than the average distance between galaxies. |
| b. | galaxies contain large amounts of neutral hydrogen. |
| c. | galaxies occur in clusters. |
| d. | a and c |
| e. | none of the above |

\_\_\_\_ 10. Astronomers now speculate that a galaxy's shape depends on all of the following except

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| --- | --- |
| a. | the rate of star formation. |
| b. | the history of past collisions. |
| c. | the mass. |
| d. | the chemical composition. |
| e. | All of the above are important in determining a galaxy's shape. |

\_\_\_\_ 11. A tuning fork diagram is shown below. Which of the labeled figures represents an Sa galaxy?



|  |  |
| --- | --- |
| a. | 1 |
| b. | 2 |
| c. | 3 |
| d. | 4 |
| e. | 5 |

\_\_\_\_ 12. Based on the galaxies found in the Local Group of galaxies, the most common type of galaxy in the universe is expected to be

|  |  |
| --- | --- |
| a. | the spiral galaxies. |
| b. | the barred spiral galaxies. |
| c. | the dwarf elliptical galaxies. |
| d. | the irregular galaxies. |
| e. | the giant elliptical galaxies. |

\_\_\_\_ 13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ galaxies contain large clouds of gas and dust, both young and old stars, but have no obvious spiral arms or nucleus.

|  |  |
| --- | --- |
| a. | Irregular |
| b. | S0 |
| c. | E7 |
| d. | Sa |
| e. | E0 |

\_\_\_\_ 14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an irregular galaxy that is believed to have collided with the Milky Way and is expected to merge with the Milky Way in the future.

|  |  |
| --- | --- |
| a. | The Andromeda galaxy |
| b. | The Small Magellanic Cloud |
| c. | M87 |
| d. | The Virgo cluster |
| e. | The Whirlpool |

\_\_\_\_ 15. The rotation curve of a galaxy can be used to determine

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| --- | --- |
| a. | the relative number of hot young stars in the galaxy. |
| b. | the relative amount of gas and dust in the galaxy. |
| c. | the radius of the galaxy. |
| d. | the luminosity of the galaxy. |
| e. | the mass of the galaxy |

\_\_\_\_ 16. The Milky Way galaxy is part of

|  |  |
| --- | --- |
| a. | the Virgo cluster. |
| b. | the Large Magellanic Cloud. |
| c. | the Small Magellanic cloud. |
| d. | the Local Group. |
| e. | a rich cluster. |

\_\_\_\_ 17. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is caused by gas and dust located in the disk of the Milky Way that absorbs light and doesn't allow us to see distant galaxies in line with the plane of the Milky Way.

|  |  |
| --- | --- |
| a. | Dwingeloo |
| b. | zone of avoidance |
| c. | Large Magellanic Cloud. |
| d. | hot intercluster medium |
| e. | Virgo cluster |

\_\_\_\_ 18. The dark matter in galaxies has been hypothesized to be composed of

|  |  |
| --- | --- |
| a. | neutral hydrogen clouds. |
| b. | dust particles. |
| c. | weakly interacting massive particles. |
| d. | H II regions. |
| e. | all of the above. |

\_\_\_\_ 19. Voids are

|  |  |
| --- | --- |
| a. | regions in an elliptical galaxy where few clouds of gas and dust are found. |
| b. | regions in the Local Group where light from distant galaxies is blocked by gas and dust. |
| c. | regions in a cluster of galaxies where no spiral galaxies are found |
| d. | regions in the universe that separate the filaments of superclusters. |
| e. | regions swept clean by the hot intergalactic medium. |

\_\_\_\_ 20. Starburst galaxies

|  |  |
| --- | --- |
| a. | contain a large number of very young stars, but very little evidence of gas clouds. |
| b. | contain a large number of very old stars and almost no gas or dust. |
| c. | are often associated with a galaxy that is colliding with another galaxy. |
| d. | are common in rich clusters. |
| e. | are composed of filaments and voids. |

\_\_\_\_ 21. An elliptical galaxy could

|  |  |
| --- | --- |
| a. | evolve into an irregular galaxy when it has used up all of its gas and dust. |
| b. | be formed from the collision and merger of spiral galaxies. |
| c. | evolve from a single spiral galaxy when the spiral has used up all of its gas and dust. |
| d. | become a starburst galaxy if it were to move through the hot intergalactic medium of a cluster. |
| e. | evolve from an S0 galaxy if the S0 galaxy were to increase its rotation rate. |

\_\_\_\_ 22. The Great Wall

|  |  |
| --- | --- |
| a. | is a filament of galactic superclusters. |
| b. | is a bridge of hydrogen stretching from the Milky Way to the Large Magellanic Cloud. |
| c. | is a structure in the Local Group composed of the most massive spiral galaxies. |
| d. | is formed by gas and dust in the disk of the Milky Way. |
| e. | is the result of a collision between three spiral galaxies. |

\_\_\_\_ 23. Most of the mass of a galaxy is

|  |  |
| --- | --- |
| a. | contained in the massive O and B stars in the galaxy. |
| b. | contained in the H I regions of the galaxy. |
| c. | contained in the H II regions of the galaxy. |
| d. | contained in the dark matter of the galaxy. |
| e. | contained in the disk of the galaxy |

\_\_\_\_ 24. If a galaxy has a radial velocity of 8000 km/sec and the Hubble constant is 70 km/sec/Mpc, what is the distance to this galaxy?

|  |  |
| --- | --- |
| a. | 8.75103 Mpc |
| b. | 2.4109 Mpc |
| c. | 5.6105 Mpc |
| d. | 114 Mpc |
| e. | 8.7510-3 Mpc |

**True/False**

*Indicate whether the sentence or statement is true or false.*

\_\_\_\_ 25. Elliptical galaxies contain more gas, dust, and young stars than do Sa galaxies.

\_\_\_\_ 26. Until recently, most astronomers thought elliptical galaxies were shaped like oblate spheroids.

\_\_\_\_ 27. Cepheid variable stars are more luminous than the sun.

\_\_\_\_ 28. The look-back time is numerically equal to the distance to a galaxy in light-years.

\_\_\_\_ 29. The rotation curve method can be applied only to pairs of galaxies orbiting each other.

\_\_\_\_ 30. Some large clusters of galaxies do not appear to contain enough mass to hold themselves together.

\_\_\_\_ 31. If H equals 50 km/sec/Mpc, then a galaxy with a radial velocity of 50,000 km/sec will have a distance of about 1 Mpc.

\_\_\_\_ 32. When two galaxies collide, they pass through each other, and their stars almost never collide.

\_\_\_\_ 33. When a large galaxy collides with a small galaxy, the smaller galaxy may be pulled apart by tidal forces.

\_\_\_\_ 34. Poor clusters of galaxies often contain an excess of E and SO galaxies.

**Answer Section**

**MULTIPLE CHOICE**

 1. ANS: A

 2. ANS: D

 3. ANS: D

 4. ANS: B

 5. ANS: E

 6. ANS: B

 7. ANS: C

 8. ANS: B

 9. ANS: D

 10. ANS: D

 11. ANS: E

 12. ANS: C

 13. ANS: A

 14. ANS: B

 15. ANS: E

 16. ANS: D

 17. ANS: B

 18. ANS: C

 19. ANS: D

 20. ANS: C

 21. ANS: B

 22. ANS: A

 23. ANS: D

 24. ANS: D

**TRUE/FALSE**

 25. ANS: F

 26. ANS: T

 27. ANS: T

 28. ANS: T

 29. ANS: F

 30. ANS: T

 31. ANS: F

 32. ANS: T

 33. ANS: T

 34. ANS: F