

Physics 1306, Exam 3 Sample Questions

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For all questions there may be more than one correct answer or there may be NO correct answers. Mark all correct answers on the answer sheet with a number 2 pencil. You will be graded RIGHT MINUS WRONG, answer by answer, not question by question! (i.e., You will receive one point for each correct answer marked and have one subtracted from your score for each incorrect answer marked. You will receive neither penalty nor bonus for any answer left blank.) DO NOT GUESS!!!!

1. Which of the following are characteristic of spiral galaxies of type SBc?
 - (a) Tightly wound spiral arms.
 - (b) A relatively small central bulge compared to the size of the disk of the galaxy.
 - (c) Compared to spiral galaxies of other types, relatively high rates of current star formation.
 - (d) A central bar.
 - (e) Compared to spiral galaxies of other types, relatively high amounts of cold interstellar gas.

2. Which of the following are ways that we detect interstellar dust in our own galaxy?
 - (a) By the way it absorbs and scatters starlight.
 - (b) By its optical emission.
 - (c) By its infra-red emission.
 - (d) By its 21 cm line emission.
 - (e) By its 21 cm line absorption.

3. Compared to the stars in the disk of our galaxy, the stars in the halo of the galaxy on average:
 - (a) are older.
 - (b) contain higher proportions of elements heavier than hydrogen and helium.
 - (c) are more luminous.
 - (d) are more massive.
 - (e) are packed more densely.

4. In a closed universe:
 - (a) universal expansion will continue for ever.
 - (b) parallel light rays will converge with time.
 - (c) The density of matter will be exactly equal to the critical density.
 - (d) the expansion rate *must* increase with time.
 - (e) the interior angles in a triangle will add up to more than 180 degrees.

5. Dark matter:
 - (a) refers to matter that is seen only through its gravitational action.
 - (b) constitutes approximately 90% of all mass in the universe.
 - (c) has been inferred as the result of calculations of big bang nucleosynthesis.
 - (d) must be composed largely of baryonic material.
 - (e) is responsible for the observed acceleration of the expansion rate of the universe.