PRACTICE EXAM

Difficulty: MEDIUM

Questions: 10

Star Death Exam

Instructions: Please answer all questions to the best of your ability.

Section 1: Multiple Choice (40 points total, 10 points each)

Instructions: Choose the best answer for each question.

Question 1: According to the presentation, what are stars primarily composed of?
A) Iron and Nickel
B) Carbon and Oxygen
C) Hydrogen and Helium
D) Silicon and Magnesium

Question 2: What triggers the formation of a new star?
A) A supernova explosion
B) The collision of two black holes
C) Nuclear fusion beginning in a protostar's core
D) The dispersal of a planetary nebula

Question 3: How does a planetary nebula form?
A) From a supernova explosion of a massive star.
B) From the core collapse of a red supergiant.
C) From the shedding of outer layers of an average star as it becomes a red giant.
D) From the merging of two neutron stars.

Question 4: What is the primary process that fuels a star during its main sequence phase?
A) Gravitational collapse
B) Chemical reactions
C) Nuclear fission
D) Nuclear fusion

Section 2: Short Answer (30 points total, 15 points each)

Instructions: Answer each question in 2-3 sentences.

Question 5: (15 points) Explain why the observation by the University of Hawaii in 2020 was significant in the study of star death.

Question 6: (15 points) Briefly describe the role of ultraviolet light in the visual appearance of planetary nebulas.

Section 3: Problem-Solving (30 points total, 15 points each)

Instructions: Provide a detailed answer for each question.

Question 7: (15 points) The presentation states that stellar nebulas collapse due to gravity and spin faster due to the law of conservation of angular momentum. Elaborate on how these two physical processes work together in the formation of a protostar from a stellar nebula.

Question 8: (15 points) Compare and contrast the eventual fates of average-sized stars and massive stars, as described in the presentation. Focus on the end products (planetary nebula vs. neutron star) and the processes leading to their formation.