GMAT考试阅读辅导（8） PDF转换可能丢失图片或格式，建议阅读原文

https://www.100test.com/kao_ti2020/171/2021_2022_GMAT_E8_80_83_E8_AF_95_c89_171898.htm Passage 8 Virtually everything astronomers known about objects outside the solar system is based on the detection of photons-quanta of electromagnetic radiation. Yet there is another form of radiation that permeates the universe: (5) neutrinos. With (as its name implies) no electric charge, and negligible mass, the neutrino interacts with other particles so rarely that a neutrino can cross the entire universe, even traversing substantial aggregations of matter, without being absorbed or even deflected. Neu- (10) trinos can thus escape from regions of space where light and other kinds of electromagnetic radiation are blocked by matter. Furthermore, neutrinos carry with them information about the site and circumstances of their production: therefore, the detection of cosmic neutrinos (15) could provide new information about a wide variety of cosmic phenomena and about the history of the universe. But how can scientists detect a particle that interacts so infrequently with other matter? Twenty-five years (20) passed between Pauli ’ s hypothesis that the neutrino existed and its actual detection: since then virtually all research with neutrinos has been with neutrinos created artificially in large particle accelerators and studied under neutrino microscopes. But a neutrino telescope, (25) capable of detecting cosmic neutrinos, is difficult to construct. No apparatus can detect neutrinos unless it is extremely massive, because great mass is synonymous with huge numbers of nucleons (neutrons

and protons), and the more massive the detector, the greater the pro(30) bability of one of its nucleon ’ s reacting with a neutrino. In addition, the apparatus must be sufficiently shielded from the interfering effects of other particles. Fortunately, a group of astrophysicists has proposed a means of detecting cosmic neutrinos by harnessing the (35) mass of the ocean. Named DUMAND, for Deep Underwater Muon and Neutrino Detector, the project calls for placing an array of light sensors at a depth of five kilometers under the ocean surface. The detecting medium is the seawater itself: when a neutrino interacts with a (40)particle in an atom of seawater. the result is a cascade of electrically charged particles and a flash of light that can be detected by the sensors. The five kilometers of seawater above the sensors will shield them from the interfering effects of other high-energy particles raining down (45) through the atmosphere. The strongest motivation for the DUMAND project is that it will exploit an important source of information about the universe. The extension of astronomy from visible light to radio waves to x-rays and gamma rays (50) never failed to lead to the discovery of unusual objects such as radio galaxies, quasars, and pulsars. Each of these discoveries came as a surprise. Neutrino astronomy will doubtless bring its own share of surprises. 1. Which of the following titles best summarizes the passage as a whole? (A) At the Threshold of Neutrino Astronomy (B) Neutrinos and the History of the Universe (C) The Creation and Study of Neutrinos (D) The DUMAND System and How It Works (E) The Properties of the Neutrino 2. With which of the following statements regarding neutrino

astronomy would the author be most likely to agree? (A) Neutrino astronomy will supersede all present forms of astronomy. (B) Neutrino astronomy will be abandoned if the DUMAND project fails. (C) Neutrino astronomy can be expected to lead to major breakthroughs in astronomy. (D) Neutrino astronomy will disclose phenomena that will be more surprising than past discoveries. (E) Neutrino astronomy will always be characterized by a large time lag between hypothesis and experimental confirmation. 3. In the last paragraph, the author describes the development of astronomy in order to (A) suggest that the potential findings of neutrino astronomy can be seen as part of a series of astronomical successes (B) illustrate the role of surprise in scientific discovery (C) demonstrate the effectiveness of the DUMAND apparatus in detecting neutrinos (D) name some cosmic phenomena that neutrino astronomy will illuminate (E) contrast the motivation of earlier astronomers with that of the astrophysicists working on the DUMAND project 4.According to the passage, one advantage that neutrinos have for studies in astronomy is that they (A) have been detected for the last twenty-five years (B) possess a variable electric charge (C) are usually extremely massive (D) carry information about their history with them (E) are very similar to other electromagnetic particles 5. According to the passage, the primary use of the apparatus mentioned in lines 24-32 would be to (A) increase the mass of a neutrino (B) interpret the information neutrinos carry with them (C) study the internal structure of a neutrino (D) see neutrinos in distant regions of space (E) detect the

presence of cosmic neutrinos 6. The passage states that interactions between neutrinos and other matter are (A) rare (B) artificial (C) undetectable (D) unpredictable (E) hazardous 7. The passage mentions which of the following as a reason that neutrinos are hard to detect? (A) Their pervasiveness in the universe (B) Their ability to escape from different regions of space (C) Their inability to penetrate dense matter (D) The similarity of their structure to that of nucleons (E) The infrequency of their interaction with other matter 8. According to the passage, the interaction of a neutrino with other matter can produce (A) particles that are neutral and massive (B) a form of radiation that permeates the universe (C) inaccurate information about the site and circumstances of the neutrino's production (D) charged particles and light (E) a situation in which light and other forms of electromagnetic radiation are blocked 9. According to the passage, one of the methods used to establish the properties of neutrinos was (A) detection of photons (B) observation of the interaction of neutrinos with gamma rays (C) observation of neutrinos that were artificially created (D) measurement of neutrinos that interacted with particles of seawater (E) experiments with electromagnetic radiation 