AQA (GCSE Notes)

Chapter 8: Space Physics

Q1. What objects are included in our solar system besides the Sun and the eight planets?

Q2. What is the name of the galaxy that contains our solar system?

Q3. What force causes dust and gas in a nebula to come together to form a star?

Q4. What is a nebula?

Q5. What triggers the start of fusion reactions in a forming star?

Q6. What is meant by gravitational collapse in the formation of a star?

Q7. Why does a star expand when fusion reactions begin?

Q8. What causes a balance between gravitational forces and fusion energy in a star?

Q9. What is meant by equilibrium in a star's life?

Q10. What determines the life cycle a star will follow?

Q11. How is the Sun classified in terms of its size?

Q12. Describe the first stage in the life cycle of a star like the Sun.

Q13. What happens after a protostar becomes hot enough for fusion to start?

Q14. What is the main sequence stage of a star?

Q15. Why does a main sequence star remain stable for millions of years?

Q16. What happens to a star when it runs out of hydrogen fuel?

Q17. What does the Sun become after the main sequence stage?

Q18. What causes a star like the Sun to become a red giant?

Q19. What happens in the core of a red giant?

Q20. What happens to the outer layers of a red giant near the end of its life?

Q21. What is left behind after a red giant loses its outer layers?

Q22. What is a white dwarf?

Q23. What happens to a white dwarf over time?

Q24. What kind of stars become supernovae?

Q25. What is a supernova?

Q26. What elements are formed during a supernova explosion?

Q27. Why are supernovae important to the universe?

Q28. What happens to the material released by a supernova?

Q29. What can be left behind after a supernova?

Q30. What is a neutron star?

Q31. What is a black hole?

Q32. How does the size of a star affect whether it becomes a black hole or a neutron star?

Q33. What is nuclear fusion?

Q34. What elements are formed during the fusion process in stars?

Q35. Why can fusion only happen under high temperature and pressure?

Q36. What is the role of gravity in the fusion process?

Q37. How do stars produce light and heat?

Q38. Why can elements heavier than iron only be made in a supernova?

Q39. What happens to the energy produced by fusion in a star?

Q40. What eventually happens to all stars, regardless of size?

Q41. Why is it said that humans are made from “star dust”?

Q42. How do the elements formed in stars reach planets like Earth?

Q43. Describe the life cycle of a star larger than the Sun.

Q44. Describe the life cycle of a star the size of the Sun.

Q45. What happens to the temperature of a protostar as it forms?

Q46. Why do massive stars have shorter life spans?

Q47. How are natural elements distributed throughout the universe?

Q48. What evidence do astronomers have that supports the life cycle of stars?

Q49. Why is the study of stellar life cycles important in astronomy?

Q50. How does fusion in stars differ from nuclear fission on Earth?

Q51. What force keeps planets and satellites in orbit around larger bodies?

Q52. How does gravity act between a planet and the Sun?

Q53. Why do satellites follow curved paths around the Earth instead of flying off into space?

Q54. What is the shape of most planetary orbits in the solar system?

Q55. How is an artificial satellite different from a natural satellite?

Q56. Give an example of a natural satellite and an artificial satellite.

Q57. How do the orbits of moons differ from the orbits of artificial satellites?

Q58. What is needed for a satellite to stay in a stable orbit?

Q59. What would happen to a satellite if gravity suddenly stopped acting on it?

Q60. Why is speed important for keeping a satellite in orbit?

Q61. How does gravity change the direction of a planet without changing its speed?

Q62. Why does an object in circular orbit have a constantly changing velocity?

Q63. What is the difference between speed and velocity in circular motion?

Q64. How does changing the speed of an orbiting object affect its orbital radius?

Q65. What happens to the orbit of a satellite if its speed increases?

Q66. What happens to the orbit of a satellite if its speed decreases?

Q67. Why do satellites closer to Earth need higher speeds to stay in orbit?

Q68. What keeps the Moon in orbit around the Earth?

Q69. Why are geostationary satellites placed in high orbits?

Q70. How do scientists launch a satellite into a stable orbit?

Q71. What is meant by a stable orbit?

Q72. What is the role of gravity in keeping artificial satellites in orbit?

Q73. How does the gravitational force change with distance from the Earth?

Q74. How does orbital period relate to the radius of orbit?

Q75. What happens to the orbital period when a satellite is in a lower orbit?

Q76. Why do satellites in lower orbits move faster than those in higher orbits?

Q77. What is red-shift?

Q78. What happens to the wavelength of light from galaxies that are moving away from us?

Q79. Why is it called red-shift?

Q80. How does red-shift provide evidence that the universe is expanding?

Q81. What does it mean if a galaxy shows a large red-shift?

Q82. What is the relationship between red-shift and the speed at which a galaxy is moving away?

Q83. What does red-shift tell us about distant galaxies?

Q84. How does the red-shift of light support the Big Bang theory?

Q85. What is the Big Bang theory?

Q86. According to the Big Bang theory, what was the state of the universe at the beginning?

Q87. What evidence supports the Big Bang model?

Q88. How did observations of supernovae in 1998 change our understanding of the universe?

Q89. What is meant by the term “receding galaxies”?

Q90. Why are galaxies with greater red-shift considered to be farther away?

Q91. What does the increasing rate of expansion of the universe suggest?

Q92. How do astronomers use red-shift data to calculate galaxy speed?

Q93. What is meant by the term “expanding universe”?

Q94. How do scientists use observations to create theories like the Big Bang?

Q95. Why are scientific theories about the universe always being revised?

Q96. What is dark matter?

Q97. What is dark energy?

Q98. Why is dark matter important in astronomy?

Q99. Why is the existence of dark energy suggested by the increasing expansion of the universe?

Q100. What is one reason scientists believe there is more to the universe than what we can see?