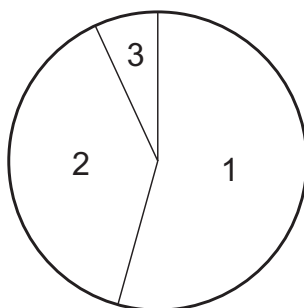


37 The Sun radiates most of its energy in three regions of the electromagnetic spectrum.

In the pie chart, region 1 is infrared radiation and region 2 is visible radiation.



What is region 3?

- A** microwave
- B** radio
- C** ultraviolet
- D** X-ray

39 Nuclear reactions in the Sun release large quantities of energy.

Which statement about this process is correct?

- A** It involves the fission of helium to produce hydrogen.
- B** It involves the fission of hydrogen to produce helium.
- C** It involves the fusion of helium to produce hydrogen.
- D** It involves the fusion of hydrogen to produce helium.

11 (a) State the condition required for a protostar to become a stable star.

.....

.....

..... [1]

(b) (i) Define the Hubble constant.

.....

.....

..... [2]

(ii) The current estimate for the Hubble constant is 2.2×10^{-18} per second.

State the equation which gives an estimate for the age of the Universe.

..... [1]

(iii) Calculate an estimate for the age of the Universe.

estimate of age = s [1]

[Total: 5]

39 The energy generated in stable stars comes from nuclear reactions.

Which type of reaction occurs in the Sun?

- A Helium nuclei break up to give hydrogen nuclei.
- B Helium nuclei join together to form hydrogen nuclei.
- C Hydrogen nuclei break up to give helium nuclei.
- D Hydrogen nuclei join together to form helium nuclei.

10 (a) The time taken for Mars to orbit the Sun is 690 Earth days. The average orbital radius of Mars is 2.28×10^8 km. An Earth day is 24 h.

Calculate the average orbital speed of Mars in km/s.

average speed = [3]

(b) State the shape of the orbits of the planets.

..... [1]

(c) Light from a distant galaxy is redshifted.

(i) Explain what is meant by redshift.

.....

..... [2]

(ii) State the quantity that the redshift of a galaxy is used to calculate.

..... [1]

[Total: 7]