

**Support Worksheet – Option E, Worksheet 2**

- 1 The parallax of a star is measured to be  $0.122''$ . Determine the distance to the star in light years. [1]
- 2 Define **apparent magnitude**. [1]
- 3 Star X has apparent magnitude 5.2 and star Y apparent magnitude 3.2. Calculate the ratio of apparent brightness  $\frac{b_x}{b_y}$ . [2]
- 4 Define **absolute magnitude**. [1]
- 5 A star has apparent magnitude  $m = 3.1$  and absolute magnitude  $M = -1.3$ . Calculate the distance to this star. [2]
- 6 A star has apparent magnitude  $m = 12$  and its distance from Earth is 520 pc. Calculate its absolute magnitude. [2]
- 7 Cepheid stars are **variable stars**.
  - a State what this means. [1]
  - b State in what way Cepheid stars are different from other variable stars. [1]
- 8 State the reason for the variation of luminosity of a Cepheid star. [1]
- 9 Cepheid variable stars are called ‘standard candles’. State what this means. [2]
- 10 Describe the **Olbers paradox**. [3]
- 11 State how the Olbers paradox is resolved in the Big Bang cosmology. [2]
- 12 Light from distant galaxies shows a redshift. State what this means and what it implies. [2]
- 13 State what is meant by the **cosmic background radiation**, CBR. [2]
- 14 Explain how the existence of the CBR is consistent with a hot Big Bang. [2]
- 15 A student claims that the Big Bang happened ‘everywhere in space’. Comment on this statement. [2]
- 16 State the reason why it has been very difficult to determine the density of the universe. [1]
- 17 Give two examples of dark matter. [2]
- 18 State what is meant by **critical density**. [1]
- 19 Explain what the comparison of the density of the universe to the critical density allows us to determine. [2]
- 20 State the main characteristic of a star that determines its eventual evolutionary fate. [1]