

PART I

Q1 Star formation occurs most frequently in which of the following sites? Select *one* of A or B and *one* from C to H in the key. Pencil across *two* cells in row 1.

KEY for Q1

- ☒ A Elliptical galaxies
- B Spiral galaxies
- C Inside supernova remnants
- D Inside planetary nebulae
- E In globular clusters
- F In HII regions
- ☒ G In dense clouds
- H In diffuse clouds

Q2 Star X and star Y have the same size but star X's temperature is 9 000 K whereas star Y's is 3 000 K. Which *one* of the following statements is *true*? Pencil across *one* cell in row 2.

KEY for Q2

- A Star X emits three times as much power as star Y.
- ☒ B Star Y emits approximately 1% of the power of star X.
- ☒ C Star X will be a reddish colour.
- ☒ D Star Y's spectrum will peak at shorter wavelengths than star X's.
- ☒ E Because all stars of the same size lie on the main sequence, star X and star Y must also both be on the main sequence.
- F Because star X and star Y have the same size, they must also have the same mass.

Q3 Figure 1 is a luminosity-temperature diagram for a cluster of stars. The heavy dot identifies the current position of a star somewhat more massive than the Sun. Where will this star move to next on the diagram as it evolves? Use the grid of faint lines in Figure 1, reproduced in Figure 2, as the key to identify the nearest appropriate point. Pencil across *one* cell in row 3.

Q4 Which *two* of the phenomena listed in the key would you *not* expect to find if you were to study a 100 million year old, 80 km diameter impact crater and associated effects on the Moon? Pencil across *two* cells in row 4.

KEY for Q4

- A Solidified impact melt ✓
- ☒ B A transient cavity ✓
- C Continuous ejecta
- ☒ D Discontinuous ejecta ✓
- E Rays ✓
- F Terraced walls ✓
- G A central peak ✓
- ☒ H A peak-ring basin ✗



Figure 1 Luminosity-temperature diagram for a cluster of stars (for use with Q3).

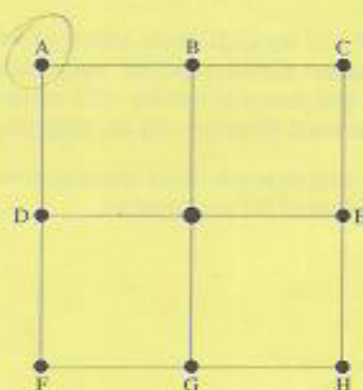


Figure 2 KEY for Q3