

Name of the Student: \_\_\_\_\_

Max. Marks : 25 Marks

Time : 25 Minutes

**Q1.**

The table summarises some of the properties of four stars in the constellation Hercules.

| Star        | Distance/pc | Spectral class | Apparent magnitude |
|-------------|-------------|----------------|--------------------|
| Kornephoros | 43          | G              | 2.8                |
| Rasalgethi  | 110         | M              | 3.0                |
| Rutilicus   | 11          | G              | 2.8                |
| Sarin       | 23          | A              | 3.1                |

(a) Define the parsec. You may use a diagram as part of your answer.

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(2)

(b) Deduce which star is larger, Kornephoros or Rutilicus.

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(3)

- (c) One of the four stars has the peak in its black-body radiation curve at a wavelength of  $1.0 \mu\text{m}$ . Calculate the corresponding temperature for this curve.

temperature = \_\_\_\_\_ K

(2)

- (d) Explain which star produced the black-body radiation curve described in question (c).

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(2)

- (e) Which star has the brightest absolute magnitude?

Tick (✓) the correct box.

Kornephoros

Rasalgethi

Rutilicus

Sarin

(1)

- (f) Determine the absolute magnitude of Sarin.

absolute magnitude = \_\_\_\_\_

(3)

(Total 13 marks)

## Q2.

- (a) Draw a ray diagram for an astronomical refracting telescope in normal adjustment. Your



