Practice Question Set For A-Level
Subject : Physics
Paper-3 Topic: Section A(Practical Skills Set-1)

Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Q1.

The table shows some properties of the four brightest stars in the constellation Canis Minor.

Name	Apparent magnitude	Absolute magnitude	Spectral class
Gamma A	4.46	–0.50	K
Gomeisa	2.89	–0.70	B
HD 66141	4.39	–0.13	K
Procyon	0.34	2.65	F

(a) Discuss, with reference to the Hipparcos scale, why many star maps show only two stars in the constellation Canis Minor.

_____

_____

_____

_____

_____

_____

(3)

(b) State and explain which star in the table above has the most prominent Hydrogen Balmer absorption lines.

_____

_____

_____

_____

(2)

(c) Deduce which star, Gamma A or HD 66141, has the larger diameter.

_____

_____

_____

_____

_____

_____

_____

_____

(3)

(d) Astronomers recently used the radial velocity method to discover an exoplanet orbiting HD 66141.

Describe the main features of the radial velocity method in the detection of planets.

_____

_____

_____

_____

_____

_____

_____

(2)

(e) Calculate the distance from the Earth to Procyon.
Give an appropriate unit for your answer.

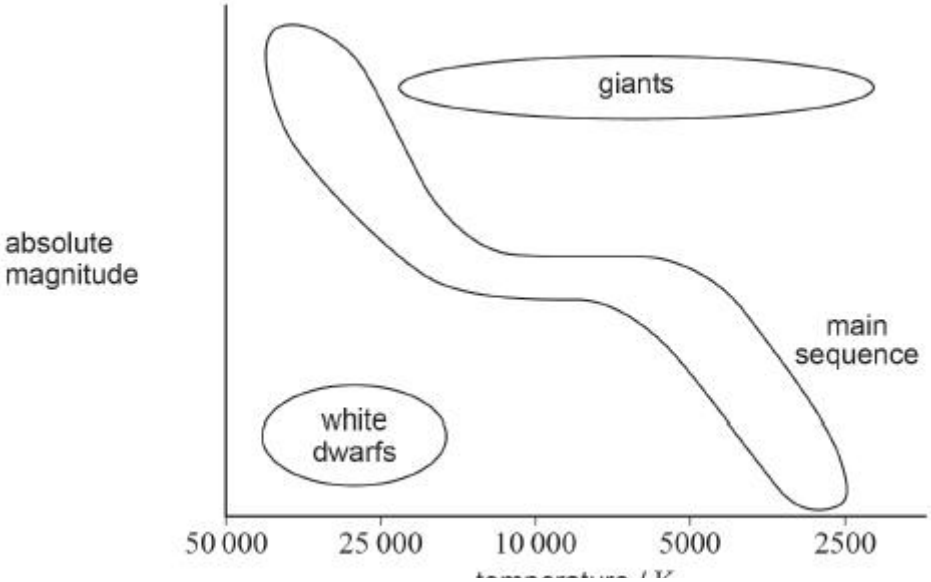
distance = _____ unit _____

(3)

(Total 13 marks)

Q2.

Below is a Hertzsprung-Russell (HR) diagram.



(a) Label the absolute magnitude axis with a suitable scale.

(1)

(b) Label with an **S** the position of the Sun on the HR diagram.

(2)

(c) Draw a line on the HR diagram to show the evolution of a star similar to the Sun from formation to white dwarf.

(2)

(d) Label with a **P** the position on the HR diagram of a star much redder, and with a greater power output, than the Sun.

(1)

(e) A star much more massive than the Sun may become a supernova and then a black hole.

Discuss whether supernovae and black holes can be placed on the HR diagram in.

_____

_____

_____

_____

_____

_____

_____

_____

_____

(3)

(Total 9 marks)