Dr GRK

DEPARTMENT OF PHYSICS

IV SEM BTech (Open Elective) – End sem exam (2015-16)
PHY 3281 - Fundamentals of Astronomy and Astrophysics

Reg No.

Marks: 50
Time: 3 hours

Useful Data:
Solar Mass = 1.98×10^{30} kg
Solar Radius = 6.96×10^{5} km
1 AU = 1.496×10^{8} km

Mass of H atom: 1.67×10^{-27} kg
G: 6.674×10^{-11} Nm^2/kg^2
k=1.381×10^{-23} J/K
Any missing data may be suitably assumed

Answer all questions

1A Describe stellar parallax method for determining the stellar distances with the help of a neat diagram **(4 Marks)**

1B With the help of a neat diagram, describe the H-R diagram. Explain how the position of a typical low mass star changes in the H-R diagram throughout its life cycle **(5 Marks)**

1C Two stars have a luminosity ratio of 10^6. Find the difference in their magnitudes **(1 Mark)**

2A Obtain expressions for Jeans mass and Jeans length **(5 Marks)**

2B Explain the internal structure of a red super-giant with a neat diagram **(3 Marks)**

2C Find the Jeans length and mass in a cloud with 10^5 H atoms per cubic centimeter and a temperature of 50 K **(2 Marks)**

3A Differentiate between the phenomena responsible for the stability of a white dwarf and that of a neutron star **(3 Marks)**

3B Describe the events resulting in the formation of a Type II supernova **(3 Marks)**

3C Describe the CNO cycle with necessary equations **(4 Marks)**

4A Describe the reason behind pulsating behavior of a PULSAR **(2 Marks)**

4B Describe the internal structure of Sun with a neat diagram. Briefly explain each regions **(5 Marks)**

4C Explain how the dark matter hypothesis originated **(3 Marks)**

5A Explain Hübble's law **(2 Marks)**

5B Describe big bang nucleosynthesis **(5 Marks)**

5C Describe major types of reflecting telescope used in astronomical observations **(3 Marks)**

****