PHD QUALIFY EXAMINATION

Stellar Astrophysics

Spring 2022

1. (45%) Explain the following terms as elaborately as possible: (3 points each)
   (1) Roche limit; (2) Oort limit; (3) Schönberg-Chandrasekhar limit;
   (4) Eddington limit; (5) Parker instability; (6) Jeans instability; (7) Faraday rotation;
   (8) Zeeman effect; (9) Stark effect; (10) dispersion measure; (11) emission measure;
   (12) rotation measure; (13) cosmological red shift; (14) gravitational red shift;
   (15) Fermi-Dirac distribution

2. (5%) Write down the equations governing the processes inside a star that describe (1) the hydrostatic equilibrium; (2) the energy generation, and (3) the radiative energy transport. State clearly the meaning of each symbol in the equations.