Assignment 9

The due date for submitting this assignment has passed. Due on 2021-03-24, 23:59 IST.

As per our records you have not submitted this assignment.

There may be multiple correct answers.

1. For a self-gravitating compressible star under solid body rotation the contours of
   1. equal pressure and equal density are possible
   2. equal gravitational potential and equal pressure are possible
   3. equal density and equal gravitational potentials are possible
   4. None of the above is incorrect. Decay
   Accepted Answers:
   equal pressure and equal density are possible
   equal gravitational potential and equal pressure are possible
   equal density and equal gravitational potentials are possible
   None of the answers is incorrect. Decay
2. For a blackbody spherical the decrease of angular velocity (Ω) with eccentricity (e) beyond e = 0.913 is associated with
   1. decrease in angular momentum
   2. increase in angular momentum
   3. no change in angular momentum
   4. the compressibility
   5. None of the answers is incorrect. Decay
   Accepted Answers:
   decrease in angular momentum
3. Effect of rotation is considerable
   1. in supernova stars
   2. in collapsing stars
   3. during formation of star
   4. none of the above
   None of the answers is incorrect. Decay
   Accepted Answers:
   in collapsing stars
4. In a collapsing star, as radius of star decreases
   1. centrifugal acceleration decreases but gravitational acceleration increases
   2. centrifugal acceleration increases but gravitational acceleration decreases
   3. both centrifugal acceleration and gravitational acceleration increase
   4. both centrifugal acceleration and gravitational acceleration decrease
   None of the answers is incorrect. Decay
   Accepted Answers:
   both centrifugal acceleration and gravitational acceleration increase
5. For a hot plasma
   1. electron temperature < core temperature
   2. the number of neutral particles is considerably greater than the ion core temperature < electron temperature
   3. both ion and electron temperature are close to ambient temperature
   4. None of the answers is incorrect. Decay
   Accepted Answers:
   both hot temperature < core temperature
6. The ionized Debye length of a space plasma
   1. depends on the plasma frequency
   2. is smaller than that of a usual laboratory plasma of same density
   3. is larger than that of a usual laboratory plasma of same density
   4. is almost equal to that of a usual laboratory plasma of same density
   None of the answers is incorrect. Decay
   Accepted Answers:
   both ionized Debye length < core temperature
7. Which one of the following is NOT a property of a plasma?
   1. uniform temperature throughout the volume
   2. space neutrality
   3. collective behaviour
   4. electrical conductivity
   None of the answers is incorrect. Decay
   Accepted Answers:
   uniform temperature throughout the volume
8. For earth’s atmosphere consider electron density (ne) and temperature (T) to be 10^17 m^-3 and 10^7 K, respectively. Debye length will approximately be equal to
   1. $10^{-7}$ m
   2. $10^{-3}$ m
   3. $10^{-2}$ m
   4. None of the answers is incorrect. Decay
   Accepted Answers:
   $10^{-3}$ m
9. For a hydrogen plasma, the ratio of ion plasma frequency ($\omega_{pi}$) to electron plasma frequency ($\omega_{pe}$) is approximately
   1. 0.001
   2. 0.123
   3. 0.053
   4. 0.324
   None of the answers is incorrect. Decay
   Accepted Answers:
   0.123
10. For a protonosphere
    1. the temperature gradient near the pole is greater than that of near the equator
    2. the temperature gradient near the pole is less than that of near the equator
    3. the temperature gradient near the pole is near the equator and the rate is equal
    4. temperature gradient cannot be defined
    None of the answers is incorrect. Decay
    Accepted Answers:
    the temperature gradient near the pole is less than that of near the equator