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General Physics-II, Quiz 7  
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St. ID: \_\_\_\_\_

Name: \_\_\_\_\_

Chapter 21-22, Serway; ***ABSOLUTELY NO CHEATING!***

*Please write down the answers on the blank space or on the back of this paper. Answer should be in english. [ ] indicates the question points.*

1. (a) What is 'Mean Free Path', express in mathematicly. (b) If you travel by Airline at 100 km altitue, what will be degree of magnitue of the mean free path for air moleules compare to sea level. [10+10 = 20]
  
2. Suppose a heat engine operates in a Carnot cycle between 50°C and 200°C and it absorbs 20 k J of energy per cycle from the hot reservoir. If the duration of each cycle is 2s. (a) Find the Carnot efficiency and mechanical power output of the engine. (b) If the duration of each cycle is reduced to 1s, will it change the Carnot efficiency? [35+5= 40]
  
3. (a) What is the physical meaning of Entropy ? (b) If two high speed train travel with the same speed at 300 km/h in opposite direction. For an unfortunate misdirection of railway administration if those trains undergo a head-on collision after few hours of their journey start and then stick together. Find the change in entropy of the surrounding air resulting from the collision while the air temperature is 25.0°C. Ignore the energy carried away from the collision by sound and let both of the train mass is also same, 20x 10<sup>3</sup>-kg. [ 5+35= 40]