8.1 p327 #1-25 Answers only

1. a) Specific energy is energy per mass. J/kg Energy density is energy per volume. J/m3

b) 7.4 x 105 J/m3

2. a) 500 MJ

b) 1.6 x 1016 J

3. a) 2.5 %

4. a) 1.04 x 109 W

b) 2.43 x 109 W

c) 1.16 x 105 kg/s

5. 6.12 km

6. 7.2 x 106 kg

7. definitions

8. a) 185 MeV

b) 6.77 x 1018 Rxns/sec

9. a) 8.2 x 1013 J/kg

b) 2.73 x 106 kg

10. a) 3.9 x 1019 Rxns/sec

b) 1.53 x 10-5 kg

11. Image

12. Light to electricity (photovoltaic) Light to heat (water)

13. a) 12.2 m3

b) Diagram

14. 6.52 m2

15. 3.63 hours

16. a) 338 K

b) 800 W

c) 40%

17. 3.6 x 1011 J

18. a) 4P, 8P, 32P

b) Not all wind stopped, E loss to friction.

19. 1) no loss to friction 2) no air turbulence (linear wind) 3) all wind stopped

20. 2.54 kW

21. a) 4.27 m b) same

22. 196 kW

23. derivation

24. incorrect

25. all end with rotational energy turned into electrical, see details for specifics.