

Ornithology Week 5 Practice Problems: Flight & Physiology

- 1) Contrast Bernoulli Lift and Newtonian Lift.
- 2) Why is V_{MR} (speed for maximum distance per unit energy) different than V_{MP} (speed with minimum energy use per unit time) for flying birds?
 - a) V_{MP} minimizes the power necessary to stay aloft but results in a lower speed and less distance covered per unit time
 - b) V_{MR} increases both profile power and parasitic drag relative to V_{MP}
 - c) V_{MR} maximizes distance per unit energy
 - d) all of the above
- 3) How is metabolic scope related to basal metabolic rate and active metabolic rate?
- 4) Contrast torpor, hypothermia, and hibernation, with avian examples of each.
- 5) Define thermoneutral zone.
- 6) Birds share two-directional airflow with other vertebrates (**T**, **F**, or **It Depends**)
- 7) Wing aspect ratio is maximized when body weight is low relative to wing area (**T**, **F**, or **It Depends**)
- 8) How are the pectoralis, supracoracoideus, and triosseal canal functionally related?
- 9) Nitrogenous waste in birds is more concentrated (in terms of mL per unit H_2O) than in humans (**T**, **F**, or **It Depends**)
- 10) Describe an experiment to test whether a sand grouse's plumage is an adaptation to hyperthermia.