School of Human Kinetics
Faculty of Health Science
APA 2315
SAMPLE FINAL EXAMINATION

1. Which of the following is a conservative force?
   (a) impact force on a rigid body
   (b) frictional force of a surface
   (c) viscous force of a fluid
   (d) force in a muscle's tendon

2. A person is standing motionless on a frictionless turntable while holding a bicycle wheel that is horizontal (axle is vertical). What happens if the wheel was stopped and the person spins the wheel in the negative direction?
   (a) The person will remain motionless.
   (b) The person will spin in the negative direction.
   (c) The person will spin in the positive direction.
   (d) The person will become dizzy and fall off the turntable.

3. Compute the work done on a Gjessing rowing ergometer if the flywheel rotates 4000 revolutions against a 35.0 newton workload. The flywheel's circumference is one metre.
   (a) 14.3 kJ
   (b) 140.0 kJ
   (c) 1400 kJ
   (d) 1373 kJ

4. What is the area (integral) under a force versus time (F vs. t) curve called?
   (a) work
   (b) energy
   (c) impulse
   (d) momentum

5. Work may be defined in the all following ways EXCEPTING
   (a) moment arm times perpendicular force times angular displacement
   (b) force times linear displacement in the same direction
   (c) rate of power production
   (d) area under a power versus time curve

6. Kinetics is the
   (a) study of motion and its causes.
   (b) study of motion without regard to its causes.
   (c) study of bodies at rest.
   (d) study of rigid bodies.

7. What is conserved when the resultant force acting on a body is a central force (i.e., its line of action passes through the centre of gravity of the body)?
   (a) moment of inertia
   (b) angular momentum
   (c) linear momentum
   (d) mechanical energy

8. What is the linear momentum of a 50.0 kg person who is running at 8.00 km/h?
   (a) 1440 kg.m/s
   (b) 1090 kg.m/s
   (c) 111.1 kg.m/s
   (d) 400 kg.m/s

9. What is the average power of a moment of force of 50.0 N.m that moves a body through a displacement of 5.00 radians in two seconds?
   (a) 250 W
   (b) 125.0 W
   (c) 500 W
   (d) 12.50 W

10. A person is holding a bicycle wheel oriented in the horizontal plane (axle is vertical). If the person rotates the wheel in the negative direction and then drops the wheel the person will:
   (a) rotate negatively then stop rotating after dropping the wheel.
   (b) rotate positively then stop rotating after dropping the wheel.
   (c) rotate positively then speed up after dropping the wheel.
   (d) rotate negatively then speed up after dropping the wheel.

11. To initiate a half-twist (i.e., cat-twist) the first movement is
   (a) to pike at the waist.
   (b) to increase the moment of inertia of the upper body.
   (c) to increase the moment of inertia of the lower body.
   (d) to twist the upper body against the lower body.

12. What is the work done by a force of (25.0, 30.0) N that moves a body through a displacement of (2.15, 4.10) metres?
   (a) 38.0 J
   (b) 167.0 J
   (c) -38.0 J
   (d) 176.8 J