Phy 111 EXAM practice exam 1 NAME_____/section____

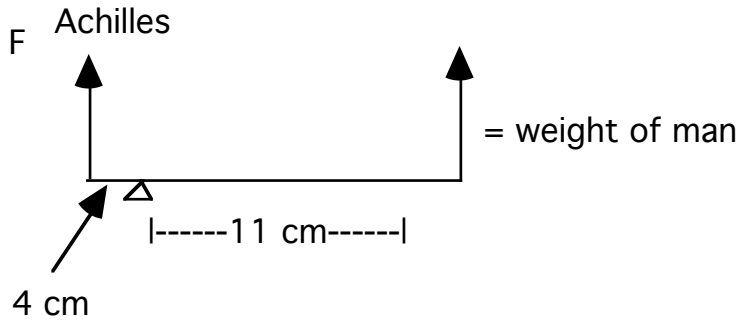
R.E. Tremblay 4.2 joules = 1 calorie $\sigma = 5.67x10^{-8}\frac{watts}{m^2 \bullet K^4}$

$c_{al} = .215\ cal/g^{\circ}C$ $c_{water}\ 1.00\ cal/g^{\circ}C$

You may omit one question by writing the word 'omit' through it. If you do not omit one, I will count only the first 10 questions. You must show all work.

1)Find the sum of the following two vectors: 25 m/s at 30 deg and 20 m/s at 220 degrees. _____

2) A man stands on his toes by exerting an upward force through the Achilles tendon. Calculate the force 'F' in the Achilles tendon if he stands on one foot and has a mass of 83 kg.



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3) If a ball is thrown straight up from a balcony at a speed of 24 m/s calculate its:
(a) position after 1.9 seconds _____
(b) its velocity after 1.9 seconds _____

4) How much kinetic friction will there be in a knee joint if the weight supported by the joint is 650 N? (coefficient of kinetic friction= .016)
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5) Two movers push horizontally on a desk which is on a flat surface. One pushes due north with a force of 300 N and the other pushes due west with a force of 640 N. The desk has a mass of 60 kg and the coefficient of friction between the desk and the floor is .14. Find the direction and magnitude of the resultant force on the desk.
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6) How much heat is required to raise the temperature of 20 grams of water from 30˚C to 80˚C in 10 seconds?_____

7) What centripetal force is necessary to hold a 1200 kg car from slipping as it rounds a corner of radius 240 m at a speed of 36 m/sec?

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8 Calculate the work done by a 75 kg person in climbing a flight of stairs 4.2m high in 4.2 seconds._____

(b) How much power was needed?_____

9. What is the rate of heat loss by radiation from a man if his emissivity is 0.76, his skin temperature is 36.2 ˚ C, the surrounding temperature is 12.0 ˚ C, and his surface area is 1.82 m^2?

10. Calculate the rate of heat flow due to conduction through a wooden wall (k=.12 W/m˚C) that measures 2.00 m by 5.12 m and is 44 cm thick. The inside temperature is 23 degrees C and the outside temperature is 2 degrees C.

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11. 240 g of water at 20 degrees Celsius are in an 86 gram, aluminum calorimeter cup. A 344 g block of metal at 98 degrees Celsius is submerged in the cup. The equilibrium temperature of the water, metal block and cup is 24 degrees. What is the specific heat capacity of the metal block?

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