(Targeting Trouble Spots)
10:00 Promptly!!
(ARC 103)

You will be permitted to open your exam at 10:00pm. You will have until 11:20pm to complete your exam.

You must arrive five minutes early to find the exam that has your name (by section and alphabetic within section). DO NOT USE SOMEONE ELSE'S EXAM.

The exam in some official lists may show to start at 9:40pm, because that is when we have been assigned the room. You will not be allowed to enter at that time, because we have to set up the room.

Remember: no phones, no bags. If you are found with a phone during the exam, you will automatically receive a grade of 0% for the exam.
Electrons flow through a circuit in the clockwise direction. The current is travelling

a) clockwise
b) counterclockwise
c) not at all
d) in a direction impossible to tell

(more information needed about the positive charges)
All electric devices are required to have identifying plates that specify their electrical characteristics. The plate on a certain steam iron states that the iron carries a current of 6.0 A when connected to a source of 120 V. What is the resistance of the steam iron (assuming it is Ohmic) ?

a) 20 ohm-m  
b) 0.050 ohms  
c) 36 watts  
d) 20 ohms  
e) 2.0 ohms
Question (Today’s Material = Review for the Exam)

Two pipes are smoothly connected without leaks. One has a diameter of 3 cm, and the other has a diameter of 5 cm. An ideal fluid flows through the pipes. In which pipe is the volume flow rate the greatest?

a) In the pipe the fluid flows through first
b) In the 3 cm diameter pipe
c) In the 5 cm diameter pipe
d) In neither; the volume flow rate is equal in both pipes
Blood pressure is normally measured with the cuff of the sphygmomanometer around the arm. Suppose that the blood pressure is measured with the cuff around the calf of the leg of a standing person. The reading of the blood pressure will be 

a) the same here as it is for the arm.  
b) less than it is for the arm.  
c) greater than it is for the arm.
Question

The density of lead is greater than that of iron and both are denser than is water. The buoyant force acting on a solid lead object in water is

a) greater  
b) less  
c) the same

as that acting on an iron solid object of the same linear dimensions also in water.
Why does the melting of ocean-based sea ice raise as much concern as the melting of land ice?

a) The melting of both types of ice raise the same amount of concern.
b) Unlike land-based ice, ocean-based ice already displaces water so that when it melts sea levels will not change much.
c) Because ocean-based ice is in the sea, it will affect sea levels much more than will land-based ice.
d) More specifics are needed to address this question.
Question

Two objects made from the same material have different masses and different initial temperatures as shown. If the bodies are placed in thermal contact, the final equilibrium temperature is most nearly

a) 27 Degrees C
b) 33 Degrees C
c) 40 Degrees C
d) 47 Degrees C
e) None of the above
f) Impossible to determine
In order to have your coffee as hot as possible when you drink it later, when should you add the room temperature cream?

a) As soon as the coffee is served
b) Just before you drink it
c) Either, as it makes no difference
d) It is impossible to determine
Question

Three engines operate between reservoirs separated in temperature by 300 K. The reservoir temperatures are as follows:

Engine A: $T_h = 1000$ K, $T_c = 700$ K
Engine B: $T_h = 800$ K, $T_c = 500$ K
Engine C: $T_h = 600$ K, $T_c = 300$ K

Rank the engines in order of their theoretically possible efficiency, from highest to lowest.

a) A, B, C
b) B, C, A
c) C, B, A
d) C, A, B
Question

If a car engine has a thermal efficiency of 50% and it does 500 J of work in one cycle, how much energy input does it require each cycle?

a) 250 J
b) 500 J
c) 750 J
d) 1000 J
Question

An ideal gas in a vertical cylinder with a movable cap of mass M is cooled. On the P-V diagram, the process corresponding to this is

a) C-B
b) A-B
c) A-C
d) C-A
e) Not shown
An ideal gas is taken around the process shown. The net work done on the gas is most nearly

a) 20 J  
b) -30 J  
c) 15 J  
d) -10 J  
e) Cannot be determined
Two moles of an ideal gas are taken along the cycle shown below. Which of the following is true about the internal energy $U$?

a) $U_0 = U_A$
b) $U_D < U_A$
c) $U_B > U_C$
d) $U_D = U_B$
e) $U_C = U_A$
Question

An ideal monatomic gas is taken around the cycle ABCD as shown below. What is the amount of energy removed by heat in one cycle?

a) 0
b) $P_1V_1$
c) $2P_1V_1$
d) $3P_1V_1$
e) $4P_1V_1$
Question

Suppose a grandfather clock is calibrated correctly at sea level and then is brought up to the top of a tall mountain. What would need to be done to calibrate the clock at the top of the mountain?

a) Nothing, as it was already calibrated at sea level
b) The bob of the pendulum should be slid slightly down the rod
c) The bob of the pendulum should be slid slightly up the rod
d) It cannot be calibrated at the top of the mountain
Question

For a simple harmonic oscillator, which of the following vector quantities cannot point in the same direction?

a) Position and Velocity
b) Velocity and Acceleration
c) Position and Acceleration
Question

If the amplitude of a system moving with simple harmonic motion is doubled, which quantity does not change?

a) Total Energy
b) Maximum Speed
c) Maximum Acceleration
d) Period
Question

A simple pendulum is suspended from the ceiling of a stationary elevator and its period is measured. If the elevator accelerates upward, the period

a) Increases
b) Decreases
c) Remains the same
Good Luck

Fingers crossed for you!

Best of luck!

You can do it!

Yes, you're a superstar!

Yes, lucky penny!