1.) In our discussions on science and technology, the group decided that:

a. There was no real difference between basic science and technology.
b. Society has had no effect on the development of technology.
c. Technology is the application of scientific discoveries to the needs of people.
d. Science is infallible; once a result is determined experimentally, it is never changed.
e. Because people have so much to do, they have not demanded technological advances to ease their work.

2.) If a cheetah can run at 60 miles/hour for 1/3 hour and a gazelle can run at 40 miles/hour for 1 hour, how do the distances they cover compare?

a) The cheetah covers twice as much distance as the gazelle.
b) The cheetah covers 1/3 as much distance as the gazelle.
c) The gazelle covers two times as much distance as the cheetah.
d) The gazelle covers the same distance as the cheetah.
e) The cheetah covers 3 times as much distance as the gazelle.

3.) Choose the correct combination of horizontal and vertical vectors which would make up the originally pictured vector below, or pick e.

![Original Vector]

a) 

b) 

c) 

d) 

e) None of the vector combinations are correct.

4.) To do an experiment well, what different components must you be sure are part of the experiment?

a. You must do the experiment several times (4 is a good number) in order to minimize random errors.
b. As you design your experiment, you need to consider possible sources of error (in advance), so that, if possible, the experiment can be conducted to take them into account.
c. While running an experiment, you must be on the look out for errors.
d. Data must be carefully recorded and values calculated using the averages of the data for least error.
e. ALL OF THE ABOVE STATEMENTS ARE CORRECT.
5) A discus is thrown into the air at 30 m/s. If air resistance is negligible, its vertical acceleration is ________ and its horizontal acceleration is _________.

a) g down, 30 m/s  
bd) 30 m/s², g down  
c) 0, g up  
ed) 30 m/s², g down  
e) g down, 0

6) In a classroom demonstration, a book and a piece of paper were dropped at the same time from the same height. When the paper was flat, we observed that __________ and when the paper was rolled into a ball, we saw that ______________.

a) both fell together, the paper landed first  
b) the book landed first both times  
c) the book landed first, the paper landed first  
d) they both fell together both times  
e) the book landed first, they both fell together

7) A car stopped to turn the corner onto Spring Street and then accelerated for 8 seconds. If the car accelerated at 0.3 m/s², how far did it travel during its acceleration?

a) 9.6 meters  
b) 19.2 meters  
c) 1.2 meters  
d) 2.4 meters  
e) 313.6 meters

8) From the graph below, how many pieces are produced in 1 hour if it takes 1.5 minutes per piece?

a. 60 pieces per hour  
b. 40 pieces per hour  
c. 15 pieces per hour  
d. 80 pieces per hour  
e. 5 pieces per hour
9.) A construction worker drops his apple from his lunch box from the top of a 3 story construction site. The apple falling to earth

a) reaches its maximum speed 1 meter after release and then falls at a constant speed thereafter.
b) speeds up as it falls, primarily because the closer the apple gets to the earth, the stronger the gravitational attraction.
c) speeds up because of the constant gravitational force acting on it.
d) falls because of the intrinsic tendency of all objects to fall toward the earth.
e) has no unbalanced forces acting on it.

10.) A 0.5 kg rock is dropped into a still pool of water. If the water resistance is 1.1 N, what is the net force experienced by the rock?

a) 4.9 N downward
b) 1.1 N upward
c) 3.8 N downward
d) 105.1 N upward
e) 60 N to right

11.) If a little girl going 0.5 m/s realizes that she can pass her little sister and get to the cookie plate first by running (at 1.2 m/s) instead of walking, what must her acceleration be in the next 2 seconds to reach that goal?

a) 0.15 m/s²
b) 0.7 m/s²
c) 0.071 m/s²
d) 0.6 m/s²
e) 0.35 m/s²

12.) A rescue plane flies over the Atlantic ocean and out drops a box of supplies. You are in a raft floating in the freezing sea. As you watch the box descend to the ocean, what path will the box take? Choose the best path.

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![Diagram of box descent with options a) to e) labeled]
13.) Which of the following statements is TRUE?
   a) The motion of the cart is constant for all 7 seconds on the graph.
   b) The cart moves more quickly in section 'c' than in section 'a'.
   c) The cart is moving rapidly in section 'd'.
   d) The cart is accelerating in section 'c'.
   e) The cart returns to its starting place in section 'b'.

14.) The speed of the cart in section 'd' is _____________.
   a) increasing with time from 10 cm/s to 40 cm/s
   b) 15 cm/s
   c) 0 cm/s
   d) 40 cm/s
   e) 30 cm/s

15.) If a mortar board is thrown into the air at graduation with an initial speed of 7m/s, what is its speed 0.5 seconds later?
   a. 7 m/s downward
   b. 3.5 m/s downward
   c. 2.1 m/s upward
   d. 2.1 m/s downward
   e. 3.5 m/s upward

Answer the following questions about the above graph of the position versus time of a cart being pulled down the sidewalk. Particular sections of the graph are designated by the letters a-e.