Eric Cai   
Science Bowl question set#3  
Chemistry short answer  
1 If you have 10 moles of lithium atoms what is the mass?  
Answer 69.41 g  
2 Chemistry short answer  
When neptunium was discovered what was the main reason why everyone was so excited?  
Answer It's was the first transuranic element.  
3 Chemistry short answer   
If you have 50 g of water at 20 degrees Celsius how much energy in calories does it take to raise it to 100 degrees as steam?   
31000 cal  
4 Chemistry short answer   
If you have 10 moles of ice at -20 degrees Celsius how much energy in calories is needed to raise it to 100 degrees Celsius in liquid form?   
36000 cal  
5 Chemistry short answer   
What is the type bond that is present in a gold ring?  
Metallic  
6 Math short answer  
What is the sum of the infinite geometric sequence in which the first three terms are 5, 2.5, 1.25...  
10  
7 Math short answer   
In a unit circle what is the relation between sine and y?  
Sine theta equals y  
8 Math short answer  
What is the sum of the infinite geometric series in which the first three terms are 1, 1/25, 1/625... round to the nearest ten thousandth.  
1.4167  
9 Math short answer   
Using a unit circle, calculate sine 750 + cosine 750? Round to the four decimal places.  
1.3660  
10 Biology short answer  
What is considered the prokaryotic "white rat" of many research labs?  
E. coli  
11 Biology short answer   
Salmonella typhi causes typhoid fever and many other bacteria of the Salmonella genus are bacteria that produce what type of protein?  
Endotoxins   
12 Biology short answer  
Methanogens are named for their unique form of energy metabolism in which H2 is used to reduce CO2 to methane. What is it poisoned by?  
Oxygen  
13 Biology short answer  
The extreme halophiles live in such saline places such as the Great Salt Lake and the Dead Sea while others required environments that are ten times saltier than seawater to survive. The colonies form a purple-red scum. What do the colonies owe their color to?  
Bacteriorhodopsin  
14 Physics short answer  
There are many ranges of sound waves. Bats can hear up 100000 hertz and dogs can hear up to 50000 hertz. What is the range that is audible to humans?  
10000 Hz-20Hz  
15 Physics short answer  
What are the waves that are under the audible range, under 20 Hz, called?  
Infrasonic  
16 Physics short Answer  
When a sound wave is shown as a pressure wave what pressure does the compression have?  
Higher than normal  
17 Physics short answer  
On a piano, there are 88 keys, will the higher key have a higher frequency or lower frequency than the lowest key?  
Higher  
18 Earth/Astro short answer  
In our Milky Way galaxy there are earth like planets that are now under investigation and research. How many are believed to exist in the Milky Way?  
2 million  
19 Earth/astro short answer  
Red dwarfs are stars that are smaller and cooler than our sun are extremely common. What percentage do they take up in the galaxy?  
80%  
20 Earth/astro short answer   
Since red dwarf produce less heat than our sun, will the earth like planets be closer or farther away from the sun?  
Closer  
21 Earth/astro short answer  
Larger planets were found to be rarer than smaller rocky planets that could be found around red dwarfs. What is the percentage of Jupiter like planets found around the red dwarfs?  
12%   
22 Energy short answer  
What is the first law of thermodynamics?  
The change in the internal energy of a closed system is equal to the energy added to the system by heating minus the work done by the system on its surroundings.  
23 Energy short answer  
What is the second law of thermodynamics?  
Heat can flow spontaneously from a hot object to a cold object; heat will not flow spontaneously from a cold object to a hot object  
24 Energy short answer  
When a system is extremely well insulated or the process is too rapid, heat which moves slowly will have no time to flow into or out of the system, what is the process called?  
Adiabatic  
25 Energy short answer  
If you were to truly complete the first law of thermodynamics, you need to consider that it is moving. What two terms due you need to put into the equation to complete it?  
Change in kinetic energy and change in potential energy