Compared to the number of genes that the prokaryotic organism E. Coli has (4,400 genes) a primitive eukaryote such as Baker’s Yeast has:

|  |  |  |
| --- | --- | --- |
|  |  | About ten times as many |
|  |  | About one hundred times as many |
| http://owl.cengage.com/owlimages/check.GIF |  | About the same number |
|  |  | About a thousand times as many |

Name the organelle involved in packaging and processing of proteins for secretion or delivery to other organelles.

|  |  |  |
| --- | --- | --- |
|  |  | peroxisome |
| http://owl.cengage.com/owlimages/check.GIF |  | Golgi apparatus |
|  |  | mitochondria |
|  |  | lysosome |

What property renders H, O, C and N atoms so suitable to the chemistry of life?

|  |  |  |
| --- | --- | --- |
|  |  | they are among the lightest elements in the periodic table |
|  |  | constitute 99% of the earth’s crust |
| http://owl.cengage.com/owlimages/check.GIF |  | able to form strong covalent bonds |
|  |  | present as gases in the environment |

The functional properties of biological molecules and biological systems depend on the ability to:

|  |  |  |
| --- | --- | --- |
|  |  | form covalent interactions between biomolecules that provide directionality and specificity to biological reactions |
| http://owl.cengage.com/owlimages/check.GIF |  | specifically recognize complementary molecules through weak, reversible chemical forces (no covalent bonds) |
|  |  | form specific, rigid, static lattices |
|  |  | operate within a wide range of physical conditions appropriate to colonization of different environments |

All biomolecules contain carbon. What properties of carbon make it so versatile? It:  
a. forms stable covalent bonds with itself  
b. forms stable covalent bonds with H, O, and N  
c. forms double bonds with itself, O and N  
d. has a tetrahedral arrangement of its single bonds  
e. forms complex 3-D structures.  
  
Choose the correct answer:

|  |  |  |
| --- | --- | --- |
| http://owl.cengage.com/owlimages/check.GIF |  | all the above |
|  |  | a, b, c and d |
|  |  | a, b and d |
|  |  | a, b, d and e |

Name the organelle involved in the oxidation of carbohydrates, lipids and amino acids with the conservation of the energy released as ATP.

|  |  |  |
| --- | --- | --- |
| http://owl.cengage.com/owlimages/check.GIF |  | mitochondria |
|  |  | lysosome |
|  |  | Golgi apparatus |
|  |  | peroxisome |

What principle underlies the structural organization of complex biomolecules? Complex molecules:

|  |  |  |
| --- | --- | --- |
|  |  | are constructed from proteins, polysaccharides and polynucleotides |
|  |  | are multifunctional enzymes |
| http://owl.cengage.com/owlimages/check.GIF |  | are constructed by polymerization of simple molecules |
|  |  | RNA and proteins |

Name the organelle that contains hydrolytic enzymes with acidic pH optimums for controlled degradation of intracellular components as well as the intracellular digestion of materials entering the cell by phagocytosis and pinocytosis.

|  |  |  |
| --- | --- | --- |
|  |  | mitochondria |
| http://owl.cengage.com/owlimages/check.GIF |  | lysosome |
|  |  | peroxisome |
|  |  | Golgi apparatus |

Hydrogen bonds are:

|  |  |  |
| --- | --- | --- |
|  |  | About as strong as a single covalent bond but weaker than a double covalent bond |
| http://owl.cengage.com/owlimages/check.GIF |  | Usually stronger than van der Waals interactions |
|  |  | Usually stronger than ionic interactions |
|  |  | All of the Above |

Whole genome sequencing of the archeon *Methanococcus jannaschii* and comparison with a variety of organisms shows that:

|  |  |  |
| --- | --- | --- |
|  |  | About 20-30% of its genes are similar to known genes in eukaryotes and eubacteria |
|  |  | About 30-40% of its genes are similar to known genes in eukaryotes and eubacteria |
| http://owl.cengage.com/owlimages/check.GIF |  | About 40-50% of its genes are similar to known genes in eukaryotes and eubacteria |
|  |  | About 50-60% of its genes are similar to known genes in eukaryotes and eubacteria |

Which of the following non-covalent bonds and interactions are particularly important in maintaining membrane structure?

|  |  |  |
| --- | --- | --- |
|  |  | H-bonds |
|  |  | van der Waals forces |
|  |  | Ionic interactions |
| http://owl.cengage.com/owlimages/check.GIF |  | Hydrophobic interactions |

A major property of biomolecules, that reflects their fitness to specify life, is that they contain biological information. The information content of biomolecules results from the:  
  
a. head-to-tail polymerization of the building block units which gives the molecule structural polarity.  
b. sequence of the component building block units.  
c. H-bond, van der Waals forces and ionic interactions which hold macromolecules together.  
d. exclusion of water from the hydrophobic interactions which would otherwise dilute out the information.  
  
Choose the correct answer:

|  |  |  |
| --- | --- | --- |
|  |  | all the above |
|  |  | a, c and d |
|  |  | c and d |
| http://owl.cengage.com/owlimages/check.GIF |  | a and b |

Hydrogen bonds are:

|  |  |  |
| --- | --- | --- |
|  |  | Significantly longer than van der Waals interactions |
| http://owl.cengage.com/owlimages/check.GIF |  | Highly directional |
|  |  | Less specific than hydrophobic interactions |
|  |  | Shorter than ionic interactions |
|  |  | All of the Above |