MCDB/CHEM 103/203 Mid-Term Examination Key, February 10, 2012

1)

Answer:

Nucleic acids (DNA and RNA), from nucleosides (or nucleotides)
Proteins, from amino acids
Lipids, from carbon-carbon / hydrocarbon bonding, or from a variety of amphipathic molecules
Glycans, from monosaccharides

2)

Answer: d

3)

Answer: d

4)

Answer:

All living things are made of cells (and their products)
Cells are the basic units of life
All cells arise from pre-existing cells

5)

Answer: b

6)

Answer:

Bacteria or Eubacteria
Archaea or Archaebacteria
Eukaryotes or Eucaryotes

7)

Answer: e

8)

Answer: b

9)

Answer: c

10)

Answer: a

11)

Answer: Any three of the following:

Glycosidic bond (glycans)
Phosphodiester bond (nucleic acids)
Peptide (or polypeptide) bond (proteins)
Carbon-Carbon bonds (lipids)

12)

Answer: b

13)

Answer: a

14)

Answer: c

15)

Answer: b

16)

Answer: DNA replicates by a semi-conservative mechanism

17)

Answer: It allows molecules to interact through electrical forces

18)

Answer: d

19)

Answer: b

20.

Answer: 1) Integral membrane proteins: hydrophobic amino acids span the bilayer
2) lipid-anchored membrane proteins, protein is attached to a membrane lipid
3) peripheral membrane proteins: Indirect association by hydrophilic interactions

21.

Answer: d

22.

Answer: d

23.

Answer: A symporter transports two molecules cross a membrane in the same direction. An antiporter transports two molecules across a membrane in opposite directions.

24.

Answer: c

25.

Answer:

1) Glycans are made up monosaccharides linked to other molecules by glycosidic bonds
2) Linkages are defined by the carbon position on the sugar ring (1 through 6)
3) Linkages are defined by the anomeric state of the glycosidic bond (alpha or beta)

26.

Answer: Glycosaminoglycans (or proteoglycans), GPI anchors (lipid-linked membrane proteins), Glycolipids, Hyaluronan, N-Glycans, O-Glycans, O-GlcNAc

27.

Answer: b

28

Answer: c

29.

Answer: Any two of the following: 1) Breakdown of fatty acids; 2) synthesis of plasmalogens (that comprise the myelin sheath of neurons); 3) detoxification of molecules (such as ethanol)

30.

Answer: d

31.

Answer : b