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BIO211 – Cell Biology and Biochemistry

Quiz-1 (September 03, 2024)

Time duration: 45 mins **Total marks: 50**

1. Answer the following:

a. Resolution of a light microscope [1 mark]
b. Size of human genome [1 mark]
c. Site for cellular respiration [1 mark]
d. Fatty acids serving as concentrated food reserve in cells [1 mark]
e. Nucleotide serving as small intracellular signaling molecule [1 mark]
f. Polysaccharide forming the plant cell wall [1 mark]
g. Chemical contained in peroxisomes [1 mark]
h. Cytoskeleton responsible for segregating the duplicated chromosomes [1 mark]
i. Four forces that determine the folding of a macromolecule into a unique shape [2 marks]
j. Two examples of 3-carbon sugar [2 marks]
k. Any to types of covalent modifications that regulate gene expression [2 marks]
l. The most abundant element on earth and in living cells [2 marks]
m. Glycolipids that help in distinguishing different blood group types [3 marks]
n. Three different types of pyrimidines [3 marks]

2. State whether the following statements are correct or incorrect? Justify your answer with proper explanation in each case. [8 X 2 marks]

a. Phospholipids assemble into lipid bilayers with the help of hydrogen bonds.
b. Nucleotides are negatively charged.
c. H1 lies in the core of the histone complex.
d. Unsaturated fatty acids make membranes more fluidic.
e. A DNA strand has a polarity because its two ends contain different bases.
f. Polysaccharides are polymers of sugars covalently linked by phosphodiester bonds.
g. A-T base pairs are more stable than G-C base pairs.
h. ATP is the energy currency of the cell.

3. How many different molecules composed of six amino acids, linked together by peptide bonds, can be made from the set of 20 naturally occurring amino acids? [2 marks]

4. Discuss the two major differences between the structure of DNA and RNA. [2 marks]

5. Match the following: [8 marks]

A.	Karyotype	i.	0.34 nm
B.	Euchromatin	ii.	Steroids enriched in cell membrane
C.	Nucleolus	iii.	Less compact chromatin, accessible for transcription
D.	Chromatin	iv.	2 nm
E.	Cholesterol	v.	Ordered display of human chromosomes
F.	Heterochromatin	vi.	Cluster of ribosomal RNA genes
G.	Length of a base pair	vii.	Complex of DNA and proteins
H.	Width of DNA helix	viii.	Highly condensed and transcriptionally silent chromatin