Cell biology
dr mona
final 2012

Al Azhar University-Gaza
Cell biology/Pharmacy
Time: 2 hours

Final exam.
1st semester 2011/2012
Student Name:----------

Answer all the following questions

Q.1. Choose the correct answer (30 marks):

1	Although the basic structure of the plasma membrane is determined mainly by its ---- , the functions of the plasma membrane are determined mainly by its ---------- .	
	A. carbohydrates, lipids	B. carbohydrates, proteins
	C. lipids, proteins	D. nucleic acids, lipids
	E. proteins, lipids	F. proteins, cholesterol
2	Which molecules in the cell membrane are mostly glycoproteins?	
	A. carrier molecules	B. channel proteins
	C. marker molecules	D. receptor molecules
	E. enzymes	F. transport proteins
3	What sequence on the template strand of DNA corresponds to the first amino acid inserted into a protein?	
	A. TCA	B.UAA
	C. UAC	D. AUG
	E. AGT	F. TAC
4	A nonsense mutation results in	
	A. an abnormal elongation of a polypeptide	B. a premature termination of the synthesis of a polypeptide
	C. a large deletion within the reading frame of a gene	D. none of the above
5	Which of the following best approximates the diameter of a typical human cell?	
	A. 1-2 mm	B. 20 μ m
	C. 2-3 μ m	D. 50 nm
6	A cell with abundant peroxisomes would most likely be involved in	
	A. secretion	B. storage of glycogen
	C. detoxification activities	D.cellular communication
7	Which of the following is a non membranous organelle?	
	A. a mitochondrion	B. the rough endoplasmic reticulum
	C. a centriole	D. a lysosome
8	A polysome contains	
	A. mRNA	B. tRNA
	C. rRNA	D. all of the above
9	The site in the biosynthetic pathway where final sorting decisions are made to target proteins to either the cell surface, to lysosomes, or to secretory granules is the:	
	A. Cis Golgi network	B. Rough Endoplasmic Reticulum (RER)
	C. Medial Golgi	D. Transport vesicles between the RER and the Golgi
	E. Trans Golgi network	F. All of the above
10	Which of the following interacts with signal recognition particle (SRP) during protein synthesis?	
	A. nuclear matrix protein	B. lysosomal hydrolase
	C. peroxisomal protein	D. mitochondrial protein
	E. chloroplast protein	F. cytoskeletal protein
11	In DNA replication	
	A. both strands replicate in the same direction	B. each strand replicates in a different direction
	C. only one strand of DNA is used as a template	D. a single strand of DNA is copied to make two single strands of DNA

12	A spontaneous mutation usually originates as an error in	
	A. DNA replication	B. DNA transcription
	C. translation	D. none of the above
13	The α helix and β sheet are found in many different proteins because they are formed by	
	A. Hydrogen bonding between the amino acid side chains most commonly found in proteins	B. Non covalent interactions between amino acid side chains and the polypeptide backbone
	C. Ionic interactions between charged amino acid side chains	D. Hydrogen bonding between atoms of the polypeptide backbone
	E. Hydrophobic interactions between the many nonpolar amino acids	F. None of the above
14	What enzyme catalyzes the formation of peptide bonds during translation?	
	A. transferase A	B. aminoacyl tRNA synthase
	C. ribosomal ATPase	D. peptidyl transferase
	E. protease	F. none of the above
15	Which of the following structure-function pairs is mismatched?	
	A. nucleolus - ribosome production	B. lysosome - extracellular digestion
	C. ribosome - protein synthesis	D. chloroplast – photosynthesis
	E. Golgi apparatus - ATP production	F. Glyoxysome – store fats
16	During which stage of meiosis do the sister chromatids begin to move toward the poles?	
	A. prophase I	B. telophase I
	C. anaphase II	D. anaphase I
	E. prophase II	F. telophase II
17	Facilitated transport and active transport are similar in that both:	
	A. require ATP	B. move substances down the concentration gradient
	C. move substances against the concentration gradient	D. are passive processes
	E. require carrier proteins	F. require receptor proteins
18	Which of the following does NOT involve microfilaments?	
	A. muscle movement	B. cytoplasmic streaming
	C. amoeboid movement	D. flagella motion
19	Which of the following structures contain enzymes?	
	A. Mitochondria	B. Lysosomes
	C. The plasma membrane	D. All of the above
20	One of the distinguishing characteristics of bacteria is the presence of a cell wall made of:	
	A. protein	B. cellulose
	C. peptidoglycan	D. glycoprotein
	E. chitin	F. glycogen
21	The gel of the extracellular matrix is composed mostly of water and	
	A. Proteoglycans	B. Collagen
	C. Keratin	D. reticular fibers
22	Which of the following represents the correct order of the phases of the cell cycle?	
	A. G_1 - G_2 - S - M	B. G_1 - G_2 - M - S
	C. G_1 - S - G_2 - M	D. G_1 - S - M - G_2
	E. G_1 - M - G_2 - S	F. S – G_1- G_2 – M

23	When a plant cell is placed in a hypotonic solution which of the following will oc	
	A. The cell will swell and burst.	B. The central vacuole gains water.
	C. The cell will shrink or shrivel.	D. Nothing
24	A 9+2 array refers to	
	A. microtubules	B. centrioles
	C. basal body	D. cilia
	E. both a and d, but not b or c	
25	Where is a partially synthesized protein bound to tRNA found?	
	A. always in the A site	B. always in the P site
	C. sometimes in the A site, sometimes in the P site	D. always in the A site, except at the final s it is found in the P site
26	A sequence of 3 bases in DNA has the sequence CGT. What is the corresponding tRNA anticodon for this sequence?	
	A. CGT	B. GCA
	C. CGU	D. GUC
27	Ribosomal proteins are synthesized in association with the	
	A. nucleolus	B. nuclear envelope
	C. rough endoplasmic reticulum	D. free polyribosomes
	E. nuclear matrix	F. bound ribosomes
28	Which event occurs at the termination of translation?	
	A. mRNA binds to a ribosome	B. tRNA binds to an amino acid
	C. rRNA dissociates from a ribosome.	D. tRNA dissociates from a ribosome
29	Organs with tissues that get stretched a lot like the heart and bladder are characterized by	
	A. tight junctions	B. Desmosomes
	C. plasmodesmata	D. gap junctions
30	Which molecule serves to destabilize the DNA helix in order to open it up, creating a replication fork?	
	A. DNA polymerase III	B. DNA helicase
	C. DNA ligase	D. single strand binding proteins
	E. DNA polymerase I	F. primase

Q.2. Complete the following (10 marks) :

1. DNA nucleotides are the result of linkages called ----------.
2. Plant cells are able to exchange materials through ----------.
3. ----------and ---------- are two classes of proteins known to regulate the cell cycle checkpoints.
4. Cancer cells form masses of cells called----------.
5. Gametes are produced by the process of----------.
6. Chromosomes form tetrads during ----------.
7. The main stages of cell division are ---------- and ----------.
8. The process of assembling a protein from RNA is called ---------- and it occurs in the ----------.
9. The requirements which are needed to pass the cell G_1 checkpoint ---------- ----------, ---------- and----------
10. The main steps of RNA processing are ----------
,----------
and----------

Q.3. True or False? And correct the false (10 marks)

1. ( ) According to the fluid-mosaic model the hydrophilic heads of the phospholipids face the intra and extracellular fluids.
2. ( ) Plants wilt when you don't water them due to decreased turgor pressure .
3. ( ) DNA ligase forms a bond between the 3'OH of the growing strand and the 5' phosphate in front of it, joining the DNA fragments together.
4. ( ) A gene is a DNA sequence that codes for a polypeptide, an rRNA or a tRNA.
5. ( ) Dyneins move organelles toward the growth of microtubules.
6. ( ) Glycogen and cellulose are polymers of α-glucose, glycogen is branched while cellulose is non branched.
7. ( ) DNA mutations are passed on to a cell's progeny.
8. ( ) Oxidation of carbohydrate needsenergy and water.
9. ( ) RNA polymerase I synthesizes mRNA while RNA polymerase II synthesize tRNA.
10. ( ) Dark field microscope is ideal for observing living microorganisms that are prepared in wet mounted slides.

Q.4. Define the following (10 marks):

1. Growth factor:

2. Nucleosome:

3. Primer:

4. Kinetochore:

5. Acrocentric chromosome:

6. Hemidesmosome:

7. Osmosis:

8. Aster:

9. Blood alkalosis:

10. G_0:

Q.5. Comment: (5 Marks)

1. Butter is solid at room temperature.

2. Low density of ice.

3. Cholesterol is a critical component of animal cell membrane.

Q.6. With drawing illustrate the following (10 Marks)

Serine	RNA	Chitin
ATP		Cholesterol

Q.7. Answer the following (25 marks):

1.What are the functions of the following?

A. Capsule

B. Microtubules

C. Golgi apparatus

2. What are the differences between the following?

A. The two types of secondary active transport

B. The two newly formed strands of DNA during replication

C. Tertiary and quaternary levels of protein.

Lecturer: Mona Wadi

Good Luck☺