

Study Guide Questions for Bio 101 Final

I. MEASUREMENTS

- 30 cm is what percent of a meter?
a) 0.3 % b) 3% c) 30% d) 70%
- 4.7 liters = _____ ml
a) 0.047 b) 4.7 c) 470 d) 4,700
- Home Depot bought sacks of cement from Mexico. The sign above the cement display reads: "100lb for \$8.00". The 100lb sacks were also marked "45 kg".
 - How many sacks of cement can you buy for 40 dollars? _____
 - How many pounds are in one kilogram?
- Convert the following fractions into percent.
 - 3/5: _____
 - 5/20: _____
- How many km are there in three thousand meters? _____
- 45 cm is 10 times _____ than 45 mm.
 - Larger
 - Smaller
- During the microscopy lab, you will use a _____ microscope.
 - Compound
 - Dissecting
- The lens closest to your eye in a microscope is the _____.
 - objective
 - ocular
- Convert this simple fraction into a decimal fraction: 9/25.
- How many centimeters are in a meter? _____ How many millimeters are in a meter? _____ How many meters are in a kilometer? _____
- The field of view is a) inversely or b) directly proportional to the magnification?

II. MICROSCOPY

- The _____ lens is the one closest to the slide.
 - Objective
 - Ocular
 - Subjective
 - Iris
- On our monocular scopes, the lens closest to your eye is what magnification?
 - 5X
 - 10X
 - 20X
 - 40X

- 3) If a red and yellow string are crossed, and you have your 43X lens all of the way down and then slowly move it up, which string will come into focus first.
 - a) The top one
 - b) The bottom one
 - c) Both simultaneously
 - d) Impossible to tell
- 4) Who were generally credited as being the first to put the microscope into common use.
 - a) The Dutch
 - b) The Portugese
 - c) The French
 - d) Santa's elves at the North Pole
- 5) What is the term for *clarity of the image*?
 - a) Magnification
 - b) depth
 - c) resolution
 - d) inversion
- 6) A magnifying lens increases or decreases the angle of light coming from an object. Circle one:
 - a) Increases
 - b) decreases
- 7) Which of the three lenses near the stage of the scope gives you the greatest magnification?
 - a) The short one
 - b) The long one
 - c) The middle one
- 8) When you're using the 4X magnification, including the lens by your eye, what is the total magnification that you see?'
 - a) 4X
 - b) 20X
 - c) 40X
 - d) 43X
- 9) The 'e' you cut out and put in the proper orientation on the slide appeared to be:
 - a) upside down
 - b) Rightside up
 - c) reversed
 - d) reversed *and* upside down
- 10) If you move the slide to the right on the stage, the image goes which way in the eyepiece?
 - a) To the right
 - b) to the left
 - c) up
 - d) down
- 11) When an object got blurry after moving it very close to your eye, inserting the pin-hole microscope (black sheet with hole in it) improved your resolution.
 - a) True
 - b) False
- 12) What happens to the size of the field of view if you increase the magnification? Does it increase or decrease the field of view.
- 13) When searching for a specimen, which lens should you use first? _____
- 14) How does the depth of focus change with magnification? Be specific... is it more shallow or deep? _____

III. SENSES AND PERCEPTION

- 1) What lobe of your brain sends motor signals?
 - a) Frontal
 - b) Temporal
 - c) Parietal
 - Occipital

- 2) What lobe of your brain processes visual signals?
b) Frontal b) Temporal c) Parietal Occipital
- 3) The reflex arc we initiated in the lab (patellar reflex) goes to the brain and back down to the spinal cord.
a) True b) False
- 4) Draw and label a reflex arc. (Five parts to it)

- 5) Which one has the greatest density of touch receptors?
a) Fingers b) Back c) Forearm
- 6) How do you have better depth perception?
a) One eye closed b) Both eyes open c) Both eyes closed

7) Name two things that can contribute to hearing loss:
_____ and _____

- 8) Which lobe of the brain processes hearing?
a) Temporal b) Occipital c) Frontal d) Parietal
- 9) Which lobe of the brain to voluntary motor signals originate within?
a) Temporal b) Occipital c) Frontal d) Parietal
- 10) The taste for the PTC and thiourea (paper strips in the lab) is influenced by your genetics.
a) True b) False

11. BONUS: How many pair of cranial nerves are there? How many pair of spinal nerves?

IV. CELLS

1. Plant cells and animal cells have mitochondria.
a) True b) False
2. The paramecium is a one-celled organism.
a) True b) False c) only when it's young
3. Both plant and animal cells are eukaryotic.
a) True b) False

4. On Elodea... what kept the chloroplasts from the middle of the cell?
a) Osmotic pressure b) Central Vacuole c) Harry Potter's magic
 5. Onion cells (the bulb part) have chloroplasts.
a) True b) False
 6. Does a stomata on a Zibrina leaf have chloroplasts?
a) Yes b) No c) only in the fall
 7. Do bacteria have a nucleus?
a) Yes b) No d) only right before they divide.
 8. What happened to the chloroplasts in the Elodea when the slide warmed up?
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9. Plant cells have:
a) A cell membrane b) a cell wall c) both 'a' and 'b' d) neither
11. How many chromosomes does a human skin cell have?
a) 23 b) 46 c) 72 d) 9
12. Adenine pairs with:
a) Thymine b) Guanine c) cytosine
13. Stomata are also called 'guard cells'. True or False

V. CHEMISTRY OF WATER

1. What type of bond holds water molecules together?
a. hydrogen bonds b. covalent bonds c. oxygen bonds
2. When it rains, what force keeps water in drops?
a. hydrogen bonds b. covalent bonds c. ionic bonds
3. What bonds are broken when water is boiled and turns to steam?
a. hydrogen bonds b. carbon bonds c. nitrogen bonds
4. _____ describes when two or more different substances are stuck together.
5. _____ describes when two or more molecules of the same substance are stuck together.

6. In plants, water climbs up small tubes from the roots to the leaves due to a process called _____ (see p. 92 of lab book).
7. T/F A pH of 3 is acidic.
8. The diffusion of water is called: _____.
9. T/F Solutes diffuse from where they are in low concentration to where they are in high concentration.
10. T/F Water diffuses from where it is in low concentration to where it is in high concentration.

VI. ENZYMES LAB

- 1) Enzymes do what to the energy of activation?
a) Increase b) decrease c) No effect
- 2) A substance that speeds reactions, but is not used up during the process is called a _____?
- 3) Name two things that can affect an enzyme's ability to function.
- 4) What kind of macromolecule are most enzymes?
- 5) All experiments should have a control.
a) True b) False
- 6) The substance or substances that the enzyme works on to produce a product is (are) called the:
a) Enzoid b) Substrate c) Control d) Catalyst
- 7) The potato juice in our experiment contained the?
a) Substrate b) Enzyme
- 8) A possible explanation that can be tested is called a _____.
- 9) Give me an example of a coenzyme. _____
- 10) What metal ion is often bound to by enzymes and helps the enzyme perform its task?

VII. PHOTOSYNTHESIS

- 1) Leaves are green because they _____ light in that wavelength.

- a) Absorb b) Reflect c) Produce
- 2) When light activates the electrons of chlorophyll, then those electrons have _____ energy.
a) More b) Less
- 3) H₂O and CO₂ yields C₆H₁₂O₆ and _____ in photosynthesis.
- 4) Is light required for photosynthesis?
a) Yes b) No c) Depends on the plant.
- 5) What is the purpose of having a control in an experiment?
- 6) Photosynthesis transforms _____ energy into _____ energy.
a. Chemical; light b. Light; chemical c. mechanical; chemical
- 7) In photosynthesis, the conversion of energy has about 1% efficiency. This means that 100 units of sun energy produce _____ unit(s) of sugar energy.
a. 1 b. 2 c. 10 d. 50
- 8) The _____ of the molecule chlorophyll are excited "activated" by light energy.
a. Electrons b. protons c. neutrons d. oxygen
- 9) The stacked discs inside a chloroplast are called:
a. Central vacuoles b. cyanobacteria c. grana d. chlorophyll
- 10) Which section of the electromagnetic spectrum drives photosynthesis?
a. Gamma rays b. ultra-violet light c. visible light d. radio waves
- 11) T/F Shorter wavelengths have more energy than longer wavelengths.
- 12) The phenol red turned _____ when CO₂ was added.
a. Blue b. white c. yellow d. purple

VIII. RESPIRATION

- 1) What organelle is the site of cellular respiration?
- 2) Which is NOT a product of respiration? A) CO₂ B) Water C) ATP D) Heat E) Oxygen
- 3) Respiration converts _____ energy into useable energy in the form of ATP.
a. Food b. light c. wind d. heat
- 4) T/F Cellular respiration helps endotherms maintain a warm internal environment.
- 5) T/F Plant cells DO NOT do cellular respiration.
6. What does BMR stand for?
7. What did the bag we put in top of the mouse chamber absorb? a) O₂ b) CO₂ c) CO

IX. SAMENESS AND VARIETY (MITOSIS AND MEIOSIS)

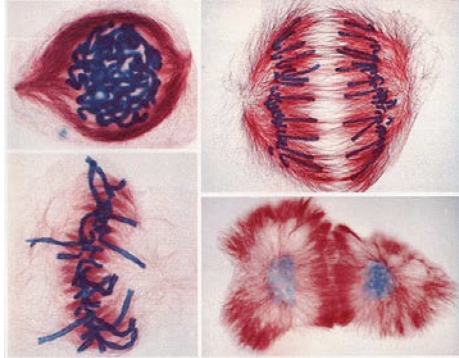
13. In mitosis, the DNA that is reproduced should be the _____ the original DNA.
a) same as b) different from
14. Normally, DNA is tightly coiled.
a) True b) False
15. What plant did we look at under the microscope to observe stages of mitosis?
a) Onion b) Sequoia c) Elodia
16. Are new skin cells basically identical after mitosis?

a) Yes b) No

17. Asexual reproduction of cells is called:

a) Mitosis b) Meiosis

18. Match the term with the picture: a) Prophase b) Metaphase c) Anaphase d) Telophase



19. Each chromosome in a homologous pair comes from:

a. The same parent b. a different parent

20. Meiosis ends with:

a. 2 identical diploid cells b. 2 haploid cells c. 4 haploid cells d. 4 diploid cells

X. BIOTECHNOLOGY: DNA LAB

1. Reproductive cells (egg and sperm) are _____ after meiosis.

a) haploid b) diploid c) tetroid

2. How do you amplify DNA?

a) PCR (polymerase chain reaction) b) DDR (DNA duplicity reaction) c) DNA cannot be amplified.

3. DNA 'fingerprinting' cannot be used to rule out suspects of a crime if blood or semen of the perpetrator is left at the scene and samples of suspects' body fluids are available.

a) True b) False

4. What 'cuts up' DNA at specific sites?

a) Proteases b) Restriction enzymes c) Amino scissors

5. _____ electrophoresis can be used to separate different length DNA molecules from each other.

a) Protein b) Plastic c) Gel d) Jello

6. Which fragment will be the furthest down the Gel after applying electricity to the unit for the specified amount of time?

a) Large b) Small c) All DNA runs the same distance

7. The DNA ran toward which electrode?
 - a) The positive one
 - b) The negative one
 - c) Depended on the size of the fragment
8. What are the sites that the DNA cutting enzymes recognized on the DNA.
 - a) Scissor sites
 - b) Recognition sites
 - c) Cognition sites
9. When isolating DNA from cheek cells, the SDS is a/n _____ solution that dissolves membranes and allows the DNA to be freed.
 - a) alcohol
 - b) polyphenol
 - c) detergent
10. Why did I pour a small amount of alcohol onto the cheek cell sample in the test tube?
 - a) alcohol breaks DNA up into nucleic acids
 - b) alcohol helps precipitate DNA

- Bonus: 11. What solution did we pour on top of the gel to help conduct electricity and stabilize the pH?
- a) buffer solution
 - b) acid solution
 - c) indicator solution
12. What charge does DNA have? a) Positive b) Negative
13. How many base-pairs of nucleotides are in our genome? (approximately)
- a) one million
 - b) one billion
 - c) three billion
 - d) a quadrillion

14. What does GFP stand for?

XI. SURROUNDED BY MICROBES

1. Which is a defining feature of prokaryotes?
 - a. no membrane-bound nucleus
 - b. membrane-bound organelles
 - c. membrane-bound nucleus
2. Bacteria are an example of:
 - a. prokaryotes
 - b. eukaryotes
3. T/F Prokaryotic organisms that perform photosynthesis contain chloroplasts.
4. T/F A eukaryotic cell is big compared to a prokaryotic cell.
5. A mushroom is an example of a:
 - a. phototroph
 - b. heterotroph
6. T/F Multicellular organisms cannot perform photosynthesis.
7. Name the three shapes of bacteria. _____

8. Do both cyanobacteria and true algae do photosynthesis?

XII. MOSSES AND FERNS

1. How many “root genes” would you expect a moss plant to have?

a. many b. a few

2. How many “leaf genes” would you expect a moss plant to have?

a. many b. a few

3. If a plant is haploid, it is more likely to have _____ structures.

a. complex b. simple

4. The fern plant that you normally see is in the _____ stage.

a. sporophyte b. gametophyte

5. The “funny-looking stalk” growing out of the moss plant with the little round balls on it was in the _____ stage.

a. sporophyte b. gametophyte

6. In which generation does meiosis occur?

a. sporophyte b. gametophyte

7. Which stage, gametophyte or sporophyte, is best suited to adapt to a dry land environment?

8. Mutations would be better tolerated by an organism that is: a) Haploid b) Diploid

XIII. DRY LAND PLANTS

1. What does conifer mean?

a) Cone-bearing b) Con-artist c) Cones and ferns

2. The cone is where the _____ generation is produced

a) Gametophyte b) Sporophyte

3. When grains which contain the male sex cells are carried by the wind to the female cones, this is called:

a) windification b) pollination c) sporphytation

4. Seeds are a ‘land-habitat’ feature of both conifers and flowering plants.

a) True b) False

5. The male organs of flowers are called _____.

a) Stamens b) Pistils c) Ovules

6. Name 2 common ways seeds can be dispersed (moved to different locations).

- _____ and _____.
7. Xylem carries water from the roots to the leaves.
a) True b) False
 8. What conducts sugars from the leaves to the roots?
a) Xylem b) Phloem c) Cambrium
 9. Where are the youngest tree rings?
a) Deep in the trunk b) Towards the periphery of the trunk c) In the middle
 10. Bonus: Somebody cut a few inches deep all of the way around the periphery of a tree trunk, and the tree died. Why?
 11. What are flowering plants? a) Gymnosperms b) Angiosperms
 12. What does the word Gymnosperm mean?
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XIV. SURVEY OF ANIMALS

1. A jellyfish and sea anemone exhibit:
a) Bilateral Symmetry b) Radial Symmetry c) Both
2. A sponge exhibits:
b) Bilateral Symmetry b) Radial Symmetry c) Both d) No Symmetry
3. Roundworms are in which Phylum?
a) Porifera b) Cnidaria c) Nematoda
4. The fossils of one celled prokaryotes date back to almost 4 billion years ago.
a) True b) False
5. The Eukaryotes appeared before the Prokaryotes in the fossil record.
a) True b) False
6. An animal without a backbone is called an _____.
7. An animal with a backbone is called a _____.
8. The oldest animal fossils discovered are:
a) Sponges b) Birds c) Dinosaurs
9. Bilateral means:
a) One sided b) Two sided c) Four sided

10. Man belongs to Kingdom:
a) Protista b) Monera c) Animalia
11. Name 2 of the 3 kinds of evidence that help us solve the 'story of life' and figure out which life forms branched from which other life forms.
- _____
12. Name the two basic designs of the digestive system.
13. What does protostome mean? What does Deuterostome mean?

XV. HEART

1. In the fetal circulation, the foramen ovale connects:
a) the right atrium to the left atrium.
b) the right ventricle to the left ventricle.
c) the right atrium to the right ventricle.
d) the left atrium to the left ventricle.
2. The P wave represents:
a) Depolarization of the ventricles.
b) Depolarization of the atria.
c) Repolarization of the atria.
d) Depolarization of polar bears.
3. Arteries always carry oxygenated blood.
a) True. b) False.
- 4) What is the MAP for someone with a B/P for 140/80?
- 5) How many chambers in the human heart?
a) One b) Two c) Three d) Four
- 6) 120/80.... What is the diastolic pressure?
a) 120 b) 80 c) 40
- 7) All arteries carry oxygenated blood.
a) True b) False
- 7) What protein carries oxygen in the RBC's?
a) Hemoglobin b) Bloodoglobin c) Ironoglobin d) Platelets
- 8) Name four things you can tell from an EKG.
- _____
- 9) Which chamber has the thickest muscle wall? And, why?

a) Right Atrium b) Left Atrium c) Right Ventricle d) Left Ventricle

10.) Does systole mean contraction or relaxation?

11.) What is another name for the tricuspid valve? What is another name for the bicuspid valve?

EMBRYOLOGY/REPRODUCTION

1) What day of the 28 day uterine cycle does ovulation generally occur?

a. Day one b. Day 14 c. Day 24 d. Day 28

2) Mature sperm are:

a) Haploid b) Diploid c) Neither

3) What connects the ovary to the uterus?

a. Eustacian tube b. vas deferens c. small intestine d) fallopian tube

4. What hormone stimulates ovulation?

a) Prolactin b) ACTC c) Leutinizing hormone c) Growth hormone

5. When the human sperm fertilizes the egg, the first stage of development is called a:

a) Zygote b) Homunculus c) Larvae

6) Name 2 hormones produced in the Anterior Pituitary.

_____ and _____

7) Name 2 hormones released from the posterior pituitary.

_____ and _____

8) What hormone causes the uterus to contract, and helps bonding between mother and newborn? _____

9) Three layers in a developing human: Endoderm, Mesoderm and _____.

EVOLUTION

- 1.) Mitochondrial DNA is passed on by:
 - a. Mother
 - b. Father
 - c. Both

- 2.) The greater the number of different mitochondrial mutations in two groups represents?
 - a.) Longer time apart
 - b.) Shorter time apart
 - c) No meaning

- 3.) Homo habilis used tools.
 - a.. True
 - b.. False
 - c.. Not known

- 4.) Modern man (Homo sapiens) and Neanderthals lived at the same time.
 - a.. True
 - b.. False

- 5.. Approximately how many years is it estimated for 1% of mitochondrial DNA to be changed by mutation?