

# Mid-Term Pre-Nursing Science

\* Required

1. Name \*

.....

2. Email address \*

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3. 1. What holds a slide on the stage of a microscope? \*

*Mark only one oval.*

- nosepiece
- stage clips
- diaphragm
- base

4. 2. What is a biological catalyst? \*

*Mark only one oval.*

- enzyme
- smooth ER
- reactant
- substrate

5. 3. What is the difference between a eukaryotic cell and a prokaryotic cell? \*

*Mark only one oval.*

- eukaryotic cells have a nucleus while prokaryotic cells don't
- eukaryotic cells only have cell walls while prokaryotic cells only have cell membranes
- prokaryotic cells have a nucleus while eukaryotic cells don't
- eukaryotic cells release acid while prokaryotic cells release bases

6. 4. If a substance has a higher concentration of  $H^+$  ions than  $OH^-$  ions, which of the following statements is true? \*

Mark only one oval.

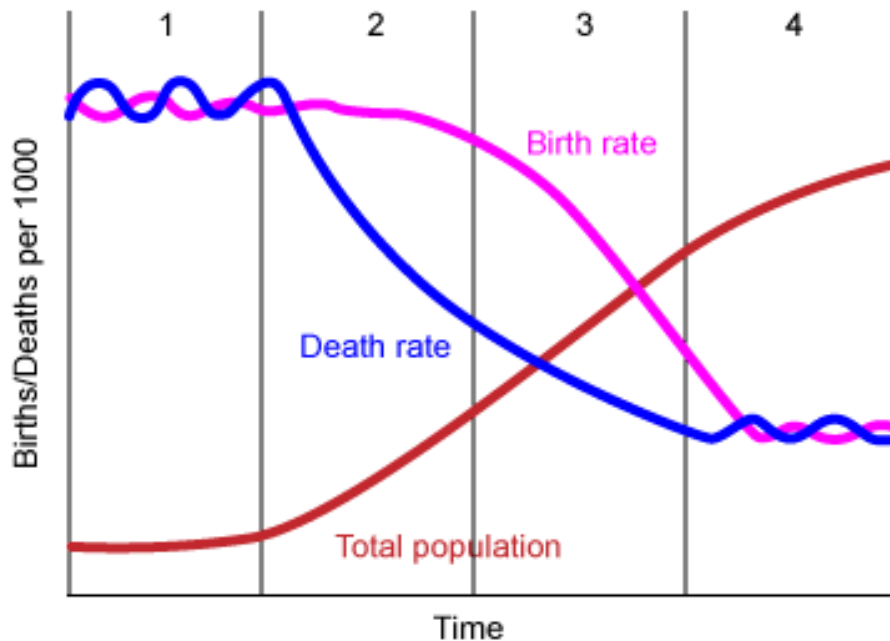
- the substance is a base
- the substance is alkaline
- the substance has a pH of greater than 7
- the substance has a pH of less than 7

7. 5. Which macromolecule is hydrophobic due to long chains of carbon and hydrogen? \*

Mark only one oval.

- DNA
- carbohydrates
- amino acids
- lipids

Figure 1.



8. 6. Which of the following scenarios would NOT explain Stage 2 of the Demographic Transition in Figure 1? \*

Mark only one oval.

- increased access to food
- improved hygiene practices
- increased access to family planning methods
- immunizations and medical improvements

9. **7. Aside from birth and death rates, what other two factors are used to calculate population growth? \***

*Mark only one oval.*

- GDP and income rates
- fertility rates and infant mortality rates
- replacement level fertility rates and epidemics
- migration and immigration

10. **8. Which phase of photosynthesis involves light-absorbing pigments such as chlorophyll? \***

*Mark only one oval.*

- Calvin Cycle
- Light Reaction
- Krebs Cycle
- Grana

11. **9. What occurs during the S phase of the cell cycle? \***

*Mark only one oval.*

- DNA is replicated
- Chromosomes line up along an imaginary center line
- chromatids separate and move to opposite ends of the cell
- the cell membrane pinches in, creating two separate cells

12. **10. What is helicase? \***

*Mark only one oval.*

- an enzymes that breaks down carbohydrates into simple sugars
- an ion of plutonium
- a nitrogenous base
- an enzyme that "unzips" DNA

13. **11. What are similar anatomical structures that appear in different animals and demonstrate descent from a common ancestor? \***

*Mark only one oval.*

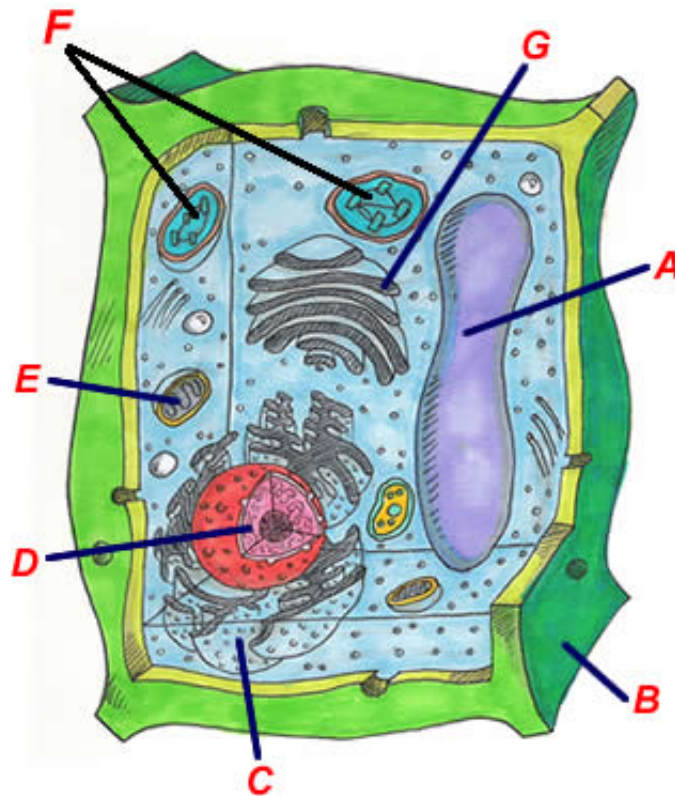
- fitness structures
- homologous structures
- Galapagos structures
- polymerase structures

14. 12. Which of the following statements concerning DNA is false? \*

Mark only one oval.

- Cytosine always pairs with adenine.
- DNA is double-stranded.
- James Watson and Francis Crick are credited with determining the structure of DNA.
- Guanine and adenine are purines.

Figure 2.



15. 13. Which of the following statements in Figure 2 is true? \*

Mark only one oval.

- The cell is a plant cell.
- The cell is a prokaryotic cell.
- The cell has a flagellum.
- The cell is an animal cell.

16. **14. Which organelle in Figure 2 contains ribosomes and produces proteins among other items that the cell needs? \***

*Mark only one oval.*

- A  
 C  
 F  
 G

17. **15. What organelle is labeled "E" in Figure 2? \***

*Mark only one oval.*

- nucleolus  
 cytoskeleton  
 tRNA  
 mitochondria

18. **16. Which imaginary plane divides an anatomical figure into equal left and right halves? \***

*Mark only one oval.*

- midsaggital line  
 transverse line  
 coronal line  
 medial line

19. **17. Tall (T) is dominant to short (t). A true breeding tall plant is crossed with a heterozygous pea plant. What is the probability of a short (tt) pea plant offspring? \***

*Mark only one oval.*

- 0%  
 25%  
 50%  
 100%

20. **18. Which of the following is NOT a property of water? \***

*Mark only one oval.*

- Ice has a higher density than liquid water.  
 Water has polar covalent bonds.  
 Pure water has low electrical conductivity.  
 Water can retain heat for longer allowing the human body to maintain a core body temperature.

21. 19. Which of the following is NOT a nitrogenous base found in DNA? \*

Mark only one oval.

- adenine
- guanine
- uracil
- thymine

22. 20. Which of the following statements concerning meiosis is false? \*

Mark only one oval.

- Crossing-over occurs during Prophase I.
- The process produces four haploid cells.
- Homologous chromosomes separate during Anaphase I.
- Cytokinesis occurs after Metaphase II.

Figure 3.

5 <b>B</b> Boron 10.811	6 <b>C</b> Carbon 12.0107	7 <b>N</b> Nitrogen 14.00674	8 <b>O</b> Oxygen 15.9994	9 <b>F</b> Fluorine 18.99840	10 <b>Ne</b> Neon 20.1797
13 <b>Al</b> Aluminum 26.98154	14 <b>Si</b> Silicon 28.0855	15 <b>P</b> Phosphorus 30.97376	16 <b>S</b> Sulfur 32.066	17 <b>Cl</b> Chlorine 35.4527	18 <b>Ar</b> Argon 39.948

23. 21. What is the atomic number for boron? \*

Mark only one oval.

- 5
- B
- Si
- 10.811

24. **22. How many protons does Aluminum have? \***

*Mark only one oval.*

- 8
- 13
- 14
- cannot be determined from the information given

25. **23. In a neutral atom of neon, how many electrons are located in its outermost shell? \***

*Mark only one oval.*

- 2
- 8
- 10
- 20

**Figure 4.**



26. **24. The chemical equation in Figure 4 is unbalanced. How many carbon dioxide molecules are there in a balanced equation? \***

*Mark only one oval.*

- 1
- 2
- 3
- 6

27. **25. What chemical reaction is represented in Figure 4? \***

*Mark only one oval.*

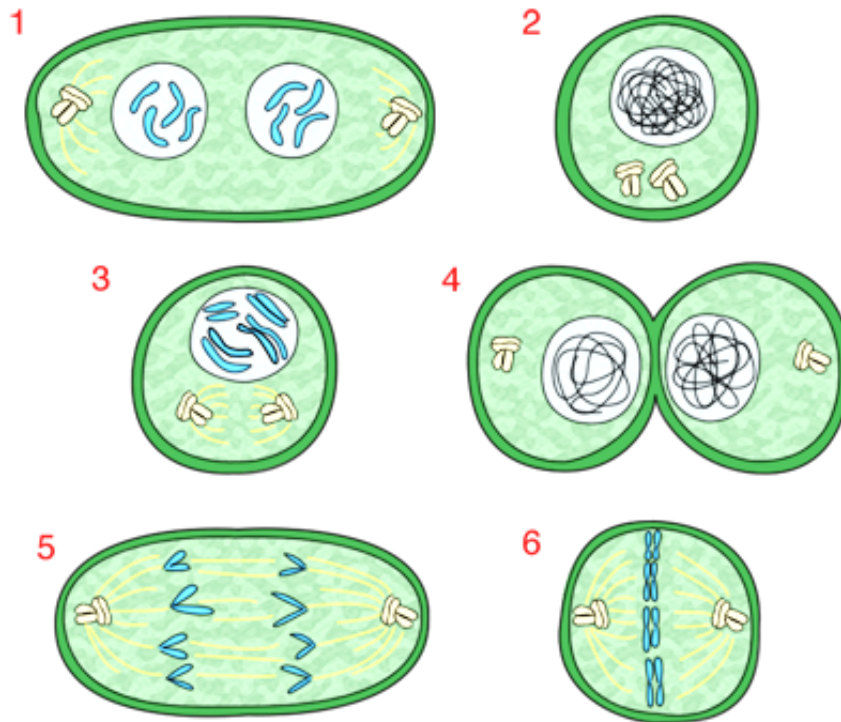
- the breakdown of fats into nucleic acids
- the building of proteins from amino acids
- cellular respiration
- dissociation of water

28. **26. Water and carbon dioxide on the right side of the chemical equation represent the \_\_\_\_\_.\***

Mark only one oval.

- reactants.  
 products.  
 enzymes.  
 limiting factors.

**Figure 5.**



29. **27. In Figure 5, what stage is represented by diagram 6? \***

Mark only one oval.

- prophase  
 metaphase  
 anaphase  
 telephase

30. **28. A chromosome is composed of two sister chromatids, connected at the \_\_\_\_\_.\***

Mark only one oval.

- centrioles  
 centromere  
 nucleosomes  
 codons



31. **29. In Figure 5, what process is occurring in diagram 4? \***

*Mark only one oval.*

- anaphase  
 interphase  
 S phase  
 cleavage

32. **30. At the end of mitosis and cytokinesis, what is the result? \***

*Mark only one oval.*

- 2 identical daughter cells  
 2 different son cells  
 4 different daughter cells  
 1 egg and 3 polar bodies

33. **31. Incomplete dominant inheritance can be seen in snapdragon flower color. If a red flower (RR) is crossed with a white flower (WW), what are the phenotypes of the offspring? \***

*Mark only one oval.*

- red  
 white  
 pink  
 purple

34. **32. What is the basic unit of life? \***

*Mark only one oval.*

- cell  
 tissue  
 organ  
 organism

35. **33. A house mouse and a flying squirrel belong to the order Rodentia. Which of the following statements is true concerning these organisms? \***

*Mark only one oval.*

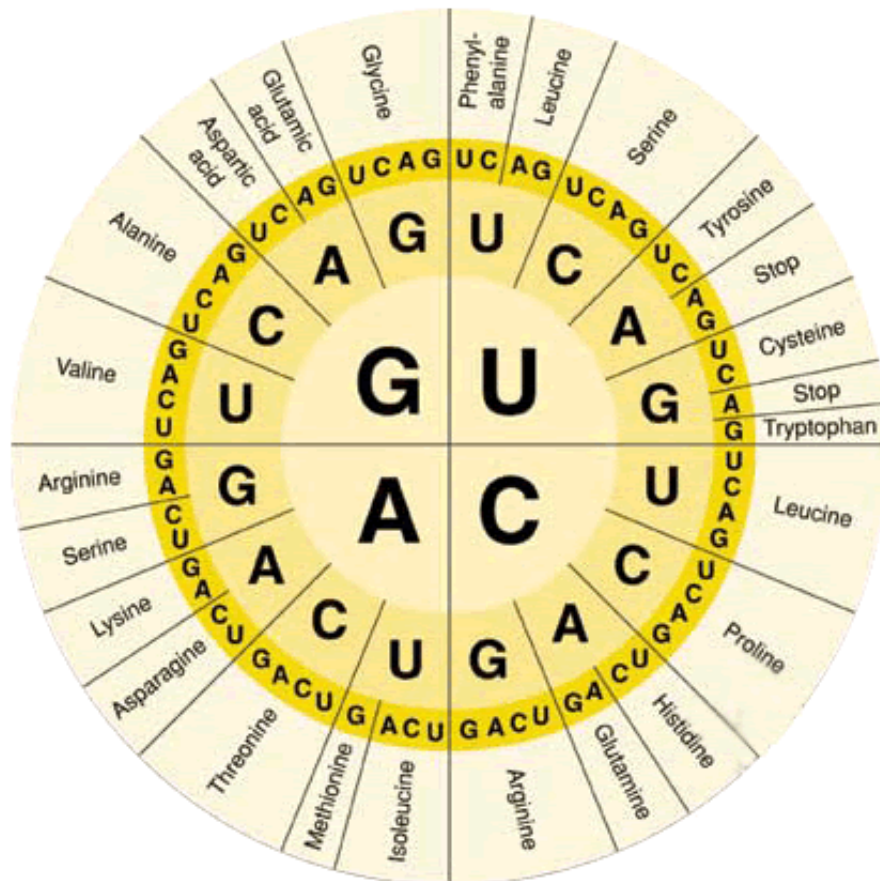
- They belong to the same kingdom.  
 They belong to the same family.  
 They belong to different domains.  
 They belong to the same genus.

36. 34. If an animal cell is placed in a hypertonic solution, what will happen to the cell? \*

Mark only one oval.

- the cell will shrivel
- the cell will fill with water and explode
- the cell will grow larger and divide
- cell size will stay the same

Figure 6.



37. 35. Using Figure 6, what amino acid strand would be created from the following mRNA template? AAG - CGA - UUA - ACG \*

Mark only one oval.

- Isoleucine - Proline - Serine - STOP
- Lysine - Arginine - Leucine - Theronine
- Lysine - Tryptophan - Glycine - Glycine
- Alanine - Glutamic Acid - Serine - Valine

38. **36. What is the primary level of protein structure? \***

*Mark only one oval.*

- the order of amino acids in the chain
- the formation of alpha helices and beta pleats
- the interaction between alpha helices and beta pleats
- multiple amino acid chains interacting

39. **37. What is an anticodon? \***

*Mark only one oval.*

- the enzyme that creates rRNA
- the enzyme that reads the DNA template and copies it
- a sequence of three nucleotides on tRNA
- the nitrogenous base that is found in RNA but not DNA

40. **38. Determine the complementary DNA sequence: ATCGGTAAT \***

*Mark only one oval.*

- TGGACCGAT
- TAGCCATTA
- STOP - Proline - Leucine
- ATCGGTAAT

41. **39. What is fitness? \***

*Mark only one oval.*

- the ability to survive and reproduce
- the healthy appearance of humans that have been going to the gym regularly
- nonheritable traits obtained during a lifetime
- LaMarck's

42. **40. How do bacteria divide? \***

*Mark only one oval.*

- binary fusion
- binary fission
- meiosis
- metaphase

43. **41. In smog-filled England, white moths are being eaten more often than black moths because they are easier to see. What process is occurring? \***

*Mark only one oval.*

- Natural selection
- Centrosome
- Polymerase Chain Reaction
- Electron Transport

44. **42. In 1859, Charles Darwin published what book? \***

*Mark only one oval.*

- Evolution: To be or not to be
- The Theory of Evolution
- Descent from Ape
- On the Origin of Species

45. **43. Rosalind Franklin's x-ray crystallography photo assisted in the discovery that \_\_\_\_\_ \***

*Mark only one oval.*

- birds are genetically similar to reptiles.
- photosynthesis occurs in the chloroplast.
- DNA is a double helix.
- a gene is the sequence of DNA that codes for a protein.

46. **44. What process results in the production of mRNA? \***

*Mark only one oval.*

- DNA replication
- transcription
- translation
- cytokinesis

47. **45. Cellular respiration is an aerobic process which means that it \_\_\_\_\_ \***

*Mark only one oval.*

- requires light-absorbing pigments.
- requires oxygen.
- takes place in the mitochondria.
- follows fermentation.

48. **46. Order the taxa from largest to smallest: \***

*Mark only one oval.*

- Domain, kingdom, phylum, class, order, family, genus, species
- Kingdom, class, family, domain, genus, species, order, phylum
- Species, genus, family, order, class, phylum, kingdom, domain
- Species, domain, kingdom, class, order, family, phylum, genus

49. **47. What is the purpose of photosynthesis? \***

*Mark only one oval.*

- To break down sugar and produce lots of cellular energy
- To recycle NAD<sup>+</sup> so that glycolysis can continue in the absence of oxygen
- To absorb light and produce sugar (glucose)
- To break down pyruvic acid and produce carbon dioxide and electron carriers.

50. **48. What are the folds of the inner mitochondrial membrane called? \***

*Mark only one oval.*

- cristae
- galactose
- stroma
- grana

51. **49. Cara and Allan are performing an experiment on plants. They want to see if plants grow better under red light or green light. They grow 100 pea plants under a red light and a 100 pea plants under a green light. At the end of four weeks, they measure the height of the plants. What is the dependent variable in this experiment? \***

*Mark only one oval.*

- The color of the light
- The height of the plants
- The 200 plants
- The soil the plants were grown in

52. **50. Which plants would you expect to grow taller (on average)? \***

*Mark only one oval.*

- The plants under red light
- The plants under green light
- Both plants should grow to the same average height
- Neither group will grow at all because plants require dark conditions to grow

53. **51. What is a group of organs called? \***

*Mark only one oval.*

- tissue
- organ system
- population
- corporeal

54. **52. Monosaccharides are to carbohydrates as \***

*Mark only one oval.*

- amino acids are to proteins.
- nucleic acids are to nucleotides.
- fatty acids are to proteins.
- nucleotides are to nitrogenous bases.

55. **53. Which structure helps an animal cell move? \***

*Mark only one oval.*

- cell wall
- flagellum
- spindle fibers
- centrioles

56. **54. Who is the Father of Modern Genetics? \***

*Mark only one oval.*

- James Watson
- Gregor Mendel
- Linus Pauling
- Thomas Malthus