

# Mid-Term Pre-Nursing Science

\* Required

1. Name \*

.....

2. Email address \*

.....

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.

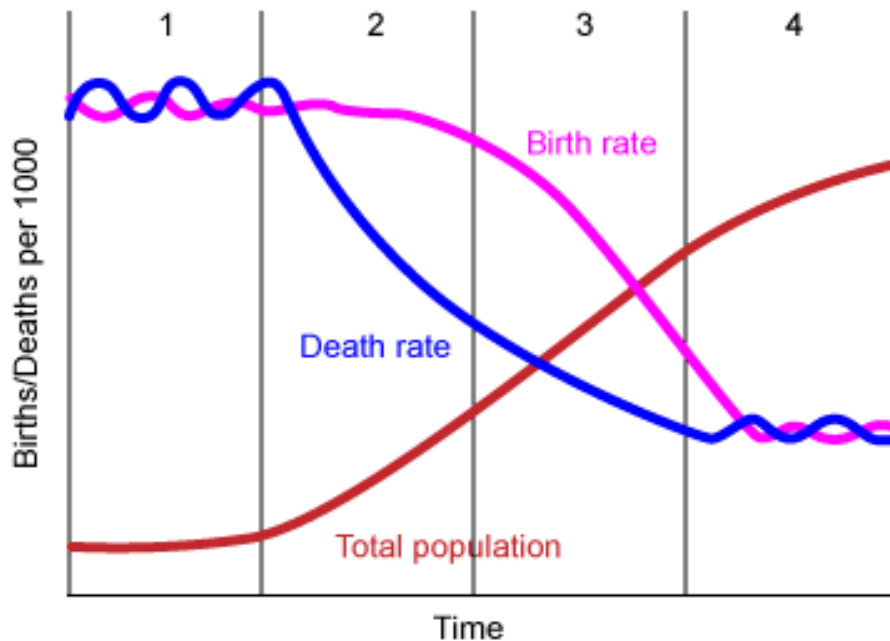
- the substance is a base
- the substance is alkaline
- the substance has a pH of greater than 7
- the substance has a pH of less than 7

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
- emigration 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.*

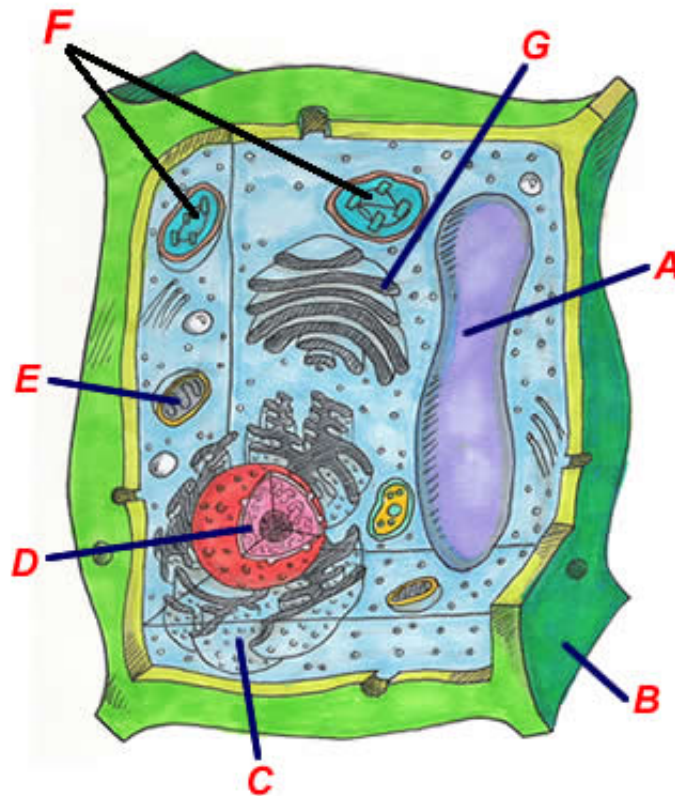
- fitness structures
- homologous structures
- Galapagos structures
- polymerase structures

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.

- midsagittal 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.*

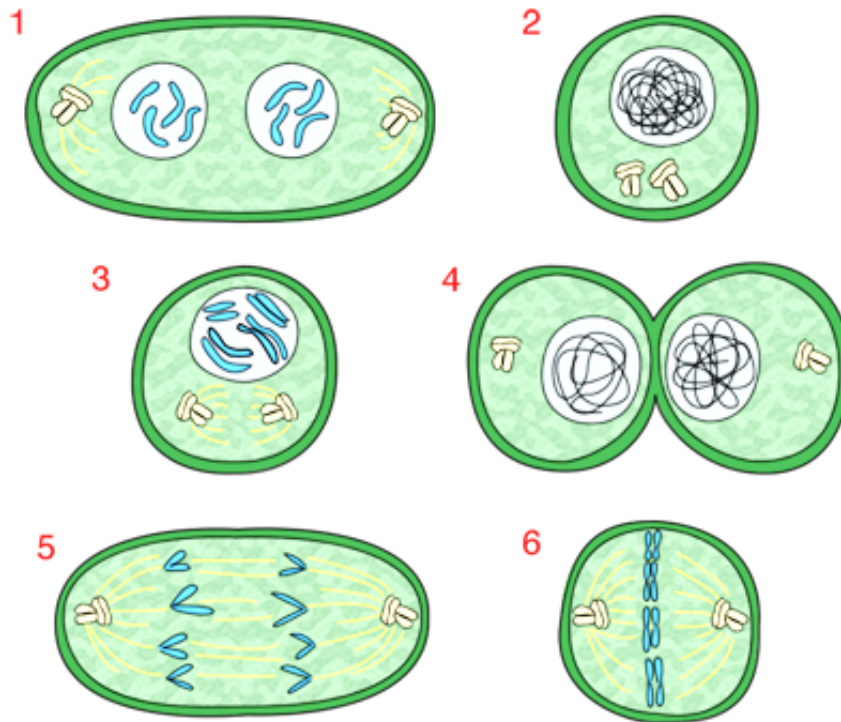
- the breakdown of fats into nucleic acids
- the building of proteins from amino acids
- cellular respiration
- dissociation of water

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.



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