Biol1000 Section C
Test 1: Thursday Oct 4, 2012
7:00pm – 7:45pm
Dr. Nicole Nivillac

This ENTIRE test package and scantron MUST be submitted to receive a grade.

Your **STUDENT NUMBER** and **NAME** must be clearly indicated on this package and scantron sheet to receive a grade.

Your **STUDENT NUMBER** must also be **BUBBLED CORRECTLY** on the scantron sheet to receive a grade.

There are 25 Multiple Choice questions (1 mark each) with one best answer per question.

ELECTRONIC AIDS (e.g. calculators, phones, iPods etc.) are **NOT PERMITTED!**

Invigilators and instructors will immediately **RELOCATE** anyone or **SUSPEND** the examination for any individual suspected of **ACADEMIC DISHONESTY.**

PLEASE MAKE SURE YOU FILL IN THE ANSWER TO EACH QUESTION ON THE SCANTRON BEFORE THE ALLOTTED TIME FOR THE TEST IS UP. YOU WILL NOT BE GIVEN EXTRA TIME TO DO SO.

If you finish the test before the allotted time then please raise your hand and an invigilator will come and collect your test.

GOOD LUCK!!!!

Last name:	**Version**
First name:	**A**
Student number	

HAVE YOU CORRECTLY FILLED IN YOUR STUDENT NUMBER ON THE SCANTRON SHEET? PLEASE CHECK

1. **You are completing VERSION A. Bubble in "A" beside #1 on your scantron. THIS QUESTION IS NOT WORTH A MARK BUT NEEDS TO BE COMPLETED TO BE GRADED.**
   A. Pick this one!
   B. Not this one!
   C. Not this one!
   D. Not this one!

2. **A plant has a unique photosynthetic pigment. The leaves of this plant appear to be red/violet. What wavelengths of visible light are being absorbed by this pigment?**
   A. Red and yellow
   B. Blue and violet
   C. Green and yellow
   D. Green and violet

3. **Which of the following statements best describes circadian rhythms?**
   A. Direct responses to changes in external light environments.
   B. Physiological and behavioral responses which occur in the brain stem.
   C. Physiological and behavioral responses with a 24 hour rhythmicity.
   D. Both answers A and C

4. **Which of the following represents the order of components in the electromagnetic spectrum from shortest to longest wavelength?**
   A. Gamma rays, microwaves, UV, light, infrared, X-rays, radiowaves
   B. Gamma rays, X-rays, UV, light, infrared, microwaves, radiowaves
   C. Infrared, microwaves, radiowaves, light, gamma rays, X-rays, UV
   D. UV, X-rays, gamma rays, light, infrared, microwaves, Radiowaves

5. **Which of the following does NOT play a role in the human circadian rhythm?**
   A. Melanin
   B. Retina
   C. Suprachiasmatic nucleus
   D. Melatonin

6. **A scientist has been tracking a mother sea turtle and observed her laying eggs one night. After about 3 months he came back one night to watch the turtles hatch but then found that instead of moving towards the sea, they were moving up the beach. What would be the <u>most likely</u> cause of this?**

   A. They did not have the ability to observe the color of the water to know that they had to move in that direction.

   B. They were distracted by the excessive amount of lights on the beach which resulted in them moving in the wrong direction.

   C. They were trying to move to an area where they would be camouflaged from predators.

   D. Their circadian rhythms (biological clocks) were not established since they had not yet been exposed to light.

7. **A human forearm, a horse's front leg, a bat's wing and a porpoise flipper have similar bone structures. What conclusions can we draw from similarities in bone structure between these mammals?**

   A. Similarities among vertebrate forelimbs suggest that they evolved in a convergent manner.

   B. Differences among vertebrate forelimbs suggest that they evolved independently.

   C. Such homologies do not exist in other areas of the vertebrate skeleton.

   D. Similarities among vertebrate forelimbs suggest that they evolved from a common ancestor.

8. **Autotrophs obtain carbon from**

   A. Any molecule

   B. Light

   C. Organic molecule CO_2

   D. Inorganic molecule CO_2

9. **A group of individuals of the same kind that occupy the same area would be a definition of**

   A. a community

   B. a population

   C. an ecosystem

   D. a biosphere

10. **Which of the following categories contain only bacteria and Archaea ("prokaryotes")?**

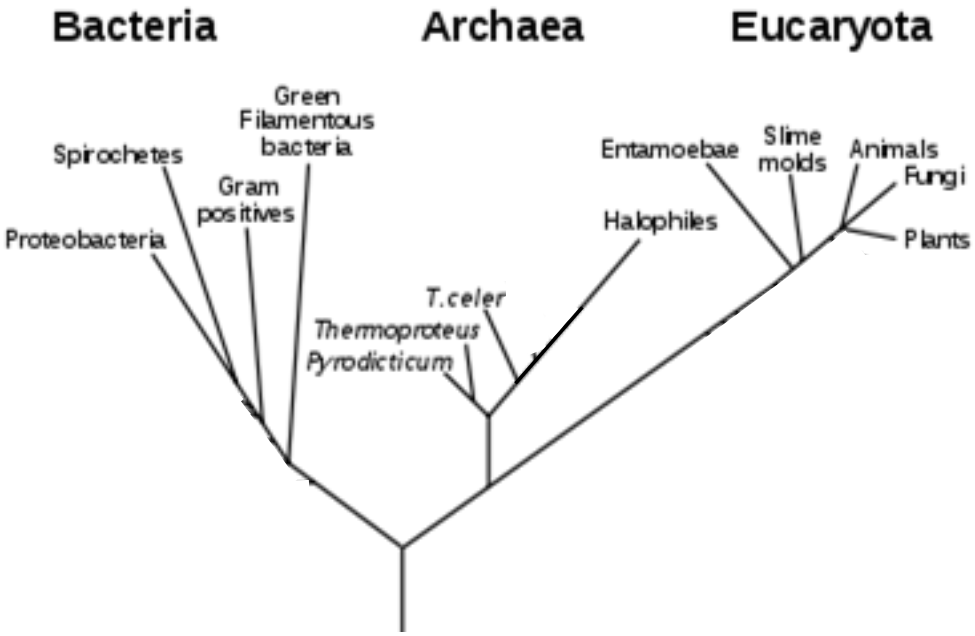
    A. Chemoautotrophs and photoautotrophs

    B. Photoheterotrophs and chemoheterotrophs

    C. Chemoautotrophs and photoheterotrophs

    D. Autotrophs and heterotrophs

11. **In the phylogenetic tree below, which species are most closely related?**



A. Thermoproteus and Halophiles
B. Spirochetes and Halophiles
C. Proteobacteria and Entamoebae
D. Pyrodicticum and Entamoebae

12. **Which of the following organisms live in extremely cold environments?**
A. Methanogens
B. Psychrophiles
C. Halophiles
D. Mesophiles

13. **Which of the following is NOT part of Darwin's Theory of Evolution by natural selection?**
A. Species produce more offspring than can survive.
B. Variation in heritable traits occurs in every population.
C. Food resources are limited and become scarce as time progresses.
D. Organisms with the most beneficial traits are likely to survive and reproduce.

14. **A man is visiting a clinic for infertility. When observing his sperm cells under the microscope it is noted that they look normal in terms of structure and function but are not moving. He also has a problem with mucous clearance by the cilia in his respiratory system. A problem/deficiency in which of the following is most likely?**
A. Dynein
B. Kinesin
C. Myosin
D. Flagellin

15. **A patient has finished his treatment for a bacterial infection with an antibiotic and feels better. However, *four days* later the same bacterial infection returns. The doctor prescribes the same course of antibiotics but this time these antibiotics do not cure the patient. What would the *most likely* reason for this be?**
    A. The antibiotic was quickly metabolized by the patient and did not have time to work.
    B. The drug killed most of the bacteria in the population but a few survived due to the presence of a resistance gene, and were subsequently able to reproduce and pass this gene onto their offspring.
    C. The non-resistant bacteria evolved within these four days such that the drug became ineffective.
    D. The patient was not treated in time and so the infection became too severe.

16. **DNA nucleotides are linked together by_____.**
    A. Hydrogen bonds
    B. Phosphodiester bonds
    C. Peptide bonds
    D. Phosphate bonds

17. **Which of the following is true regarding the DNA of both Bacteria and Archaea?**
    A. Some bacteria and Archaea contain DNA in the form of small circular plasmids.
    B. Bacteria and Archaea do not have chromosomes.
    C. DNA is present in a nucleus that is much smaller than the nucleus of a eukaryotic cell.
    D. Some Bacteria and Archaea have DNA in the form of pili that extend from the cell surface.

18. **A scientist has a vial containing DNA and tries to digest it with DNA digesting enzymes. After analyzing it, she finds that no digestion occurred. What would be the *most likely* reason for this?**
    A. The DNA was tightly packed in the forms of euchromatin.
    B. The DNA was tightly packed into 10nm chromatin fibres.
    C. The DNA was tightly packed into 30nm chromatin fibres.
    D. The DNA strand was embedded in the hydrophobic region of the plasma membrane.

19. **You are sitting in lecture and you decide to leave the room for a minute. When you return, the professor is describing a cytoskeletal component and states that these fibres are thin and consist of two rows of protein subunits wound around each other in a long spiral. Because you left the room you have no idea which cytoskeletal component is being referred to but, because you read the book before you came to class, you know that it is**
    A. The microtubules
    B. The intermediate filaments
    C. The microfilaments
    D. None of the above

20. **In eukaryotic cells, rRNA is transcribed in the _____ .**
    A. Nucleolus
    B. Nucleoid
    C. Nuclear lamina
    D. Nucleoplasm

21. **Which situation would favour diffusion of constituents (*e.g.* ions, nutrients) in and out of the cell?**
    A. A low surface area and high volume.
    B. Equal concentrations of a constituent on either side of the membrane.
    C. High surface area and low volume.
    D. Equal surface area and volume.

22. **You are using a plasmid to transform *E. coli* but this plasmid lacks a marker gene. What do you predict will be the result of this transformation?**
    A. Restriction enzymes will not be able to cut the DNA.
    B. You will not be able to ligate the plasmid to the gene of interest.
    C. You will not be able to identify cells that have been transformed.
    D. All cells will be transformed.

23. **Which of the following make Yeast a good organism for Biotechnology?**
    A. They are prokaryotic and are therefore well characterized.
    B. They are eukaryotic and grow well in inexpensive media.
    C. They exist solely in a haploid state.
    D. They do not go through meiotic division.

24. **Which of the following is a location where *both* DNA and ribosomes are *unlikely* to be found in *any* type of cell?**
    A. Chloroplasts
    B. Mitochondrial matrix
    C. Nucleus
    D. Golgi

25. **The protein keratin is common in hair and nails. During its folding process, alpha helices start forming as**
    A. part of the primary structure of the protein
    B. part of the secondary structure of the protein
    C. part of the tertiary structure of the protein
    D. part of the quaternary structure of the protein

26. **Arrange the following statements in the correct order based on how the events occur in a cell:**

1. Polypeptide chains (proteins) move through rough ER and are then carried in vesicles to Golgi.

2. Vesicles, carrying newly formed proteins to plasma membrane, are pinched off from the Golgi.

3. The Golgi separates and modifies proteins and then packages them into vesicles.

4. Initiated by RNA, polypeptide (protein) chains are made by ribosomes on rough ER.

A. 1, 2, 3, 4
B. 4, 1, 3, 2
C. 2, 3, 1, 4
D. 3, 2, 4, 1
E. 1, 4, 2, 3
F. 4, 1, 2, 3
G. 3, 4, 1, 2