

**Biology 2201
Common Exam
Sample**

**Part I
Total Value 75%**

Instructions: Place the letter of the correct answer on the answer sheet provided.

1. The statement, "All living organisms are made up of one or more cells" supports which of the following ideas.

(A) Abiogenesis	(C) Cell theory
(B) Biogenesis	(D) Spontaneous generation

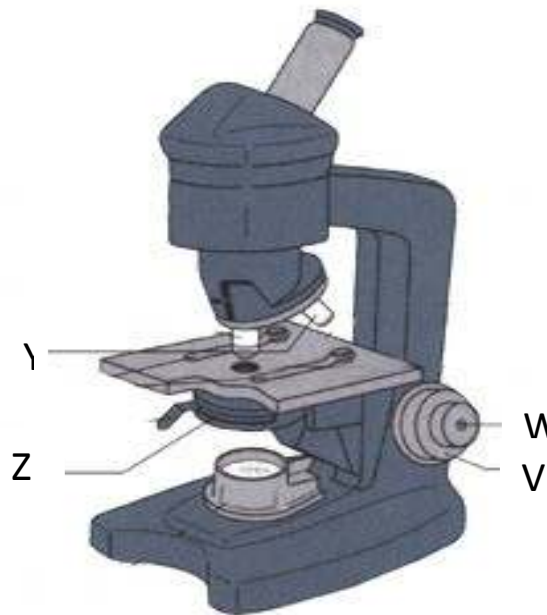
2. Which scientist conducted an experiment that proved that maggots can appear on meat after flies landed on it?

(A) Aristotle	(C) Redi
(B) Needham	(D) Spallanzani

3. A student is viewing a paramecium using a compound light microscope. When the student shifts the slide to the left, what happens to the specimen?

(A) The specimen does not appear to change position	(B) The specimen is inverted
(C) The specimen moves to the left	(D) The specimen moves to the right

4. Identify the part of the microscope used for focusing a specimen under low power.



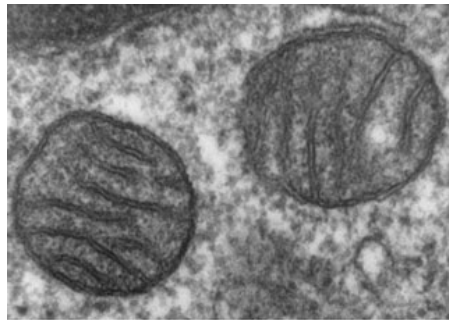
- | | |
|-------|-------|
| (A) V | (C) Y |
| (B) W | (D) Z |

5. Which organelle is the golgi apparatus?



- (A) 5
- (B) 6
- (C) 8
- (D) 9

6. Which type of imaging tool is the mitochondria (shown) being viewed with?



- (A) Compound microscope
- (B) Scanning electron microscope
- (C) Simple microscope
- (D) Transmission electron microscope

7. Which organelle is found in animal cells?

- (A) Cell wall
- (B) Chloroplast
- (C) Central vacuole
- (D) Centrosome

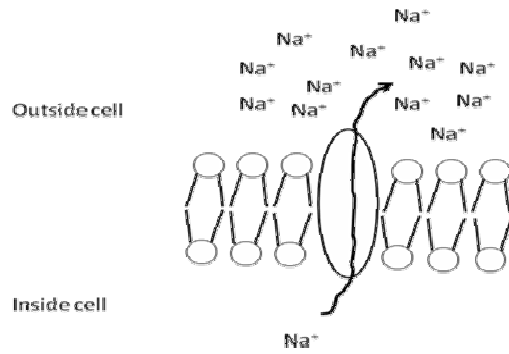
8. By what mechanism do sodium ions move across the cell membrane?

- (A) Bulk transport
- (B) Carrier proteins
- (C) Channel proteins
- (D) Osmosis

9. A cell is placed in an isotonic solution. Which of the following will occur?

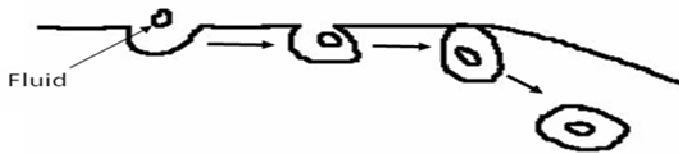
- (A) Solutes will move into the cell
- (B) The cell will shrink in size
- (C) There will be no change in the cell
- (D) Water molecules will move into the cell

14. What cellular process is illustrated in the diagram?



- (A) Active transport
- (B) Simple diffusion
- (C) Facilitated diffusion
- (D) Osmosis

15. Which cellular process is illustrated in the drawing?



- (A) Diffusion
- (B) Exocytosis
- (C) Phagocytosis
- (D) Pinocytosis

16. A scientist placed the marine motile photosynthetic Protist Euglena into a freshwater environment. Which is true for this situation?

- (A) There will be no change in the Euglena
- (B) The Euglena will swell and burst
- (C) The Euglena will swell but not burst
- (D) The Euglena will shrink in size

17. Nexium is a drug that blocks the flow of H^+ ions across the cell membrane. Which biological process is most affected by this drug?

- (A) Pinocytosis
- (B) Phagocytosis
- (C) Exocytosis
- (D) Facilitated diffusion

18. Why is gargling salt water used as a treatment for a sore throat?
- (A) A hypertonic environment causes bacterial cells to shrink and die
 - (B) A hypotonic environment causes bacteria cells to burst and die
 - (C) Salt water numbs the nerves in the throat
 - (D) Salt water reduces saliva resulting in less swallowing

19. The surface area and volume are given for four different cells as illustrated in the table below. Which of these cells would be most efficient?

	Surface Area(mm ²)	Volume (mm ³)
(A)	2	6
(B)	9	3
(C)	45	80
(D)	60	120

20. The evolutionary history of a related group of organisms is known as what?

- (A) Anatomy
- (B) Cladistics
- (C) Embryology
- (D) Phylogeny

21. The naming of organisms is known as which of the following?

- (A) Cladistics
- (B) Homology
- (C) Phylogeny
- (D) Taxonomy

22. Which Kingdom is characterized by radial symmetry?

- (A) Annelida
- (B) Arthropoda
- (C) Cnidaria
- (D) Platyhelminthes

23. In which Kingdom would a single celled prokaryotic autotroph be found?

- (A) Plantae
- (B) Bacteria
- (C) Fungi
- (D) Protista

24. In which Kingdom would a multi-celled, eukaryotic, autotrophic, non-motile organism be found?

- (A) Archaea
- (B) Fungi
- (C) Plantae
- (D) Bacteria

25. What are the main shapes of Bacteria?
- (A) Cocci, bacilli, spirilli (C) Cocci, cubic, spirilli
 (B) Cubic, bacilli, spirilli (D) Cocci, cubic, bacilli
26. Which of the following environments would not support Archaea?
- (A) Acid lakes (C) Ocean vents
 (B) Marshes (D) Volcanoes
27. Asexual reproduction in bacteria occurs by which process?
- (A) Binary fission (C) Meiosis
 (B) Conjugation (D) Mitosis
28. Which is a common feature of all fungi?
- (A) Autotrophic (C) Multicelled
 (B) Mobility (D) Spores
29. Which is the gametophyte in ferns?
- (A) Frond (C) Sori
 (B) Prothallus (D) Sporangium
30. Which of the following plants requires the presence of water for reproduction?
- (A) Birch Tree (C) Pine Tree
 (B) Fern (D) Rose Bush
31. Which shows the correct pairing for fertilization and development in the vertebrate classes?

	Class	Fertilization	Development
(A)	Ostieicthyes	Internal	Internal
(B)	Amphibia	External	External
(C)	Aves	Internal	Internal
(D)	Reptilia	External	External

32. Which is the correct sequence for the heirarchical classification system?
- (A) Kingdom, Class, Phylum, Order, Family, Genus, Species
 (B) Kingdom, Phylum, Class, Order, Family, Genus, Species
 (C) Kingdom, Phylum, Class, Order, Family, Species, Genus
 (D) Phylum, Kingdom, Order, Family, Genus, Species

37. Which Phylum is characterized by having bilateral symmetry and two-way digestion?

- (A) Cnidarian
- (B) Nematoda
- (C) Platyhelminthes
- (D) Porifera

38. How could the heart of an Osteichthyes be considered more efficient than that of Amphibia?

- (A) Amphibia are typically larger than Osteichthyes
- (B) Osteichthyes are more evolutionary advanced than amphibian
- (C) Osteichthyes have a three chambered heart and amphibians have a two chambered heart
- (D) There is no mixing of oxygenated and deoxygenated blood

39. In a greenhouse a grower is growing ferns, gymnosperms and angiosperms. While away, the sprinkler system keeps the plants well watered, however the greenhouse itself is kept closed. Which of the plants has the greatest chance of successful reproduction?

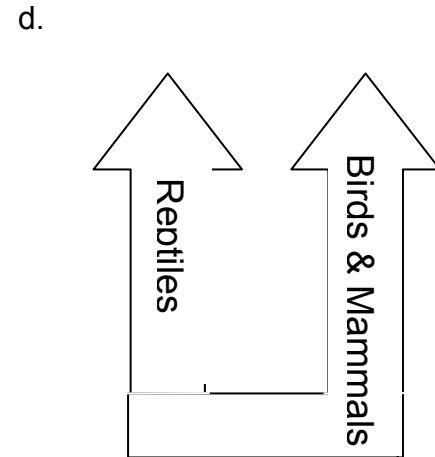
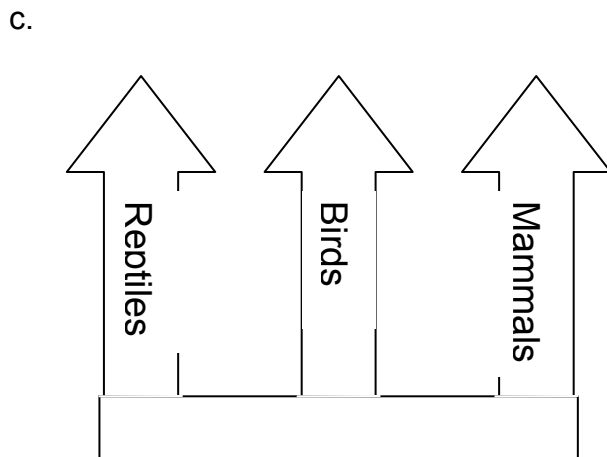
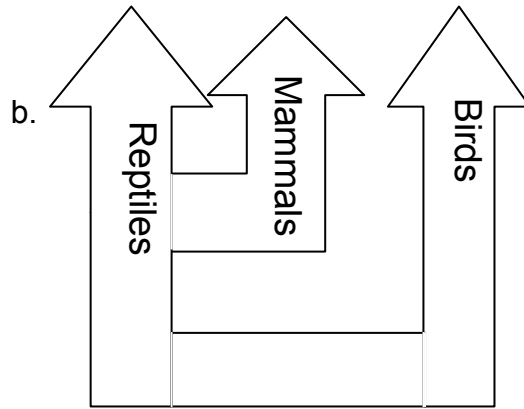
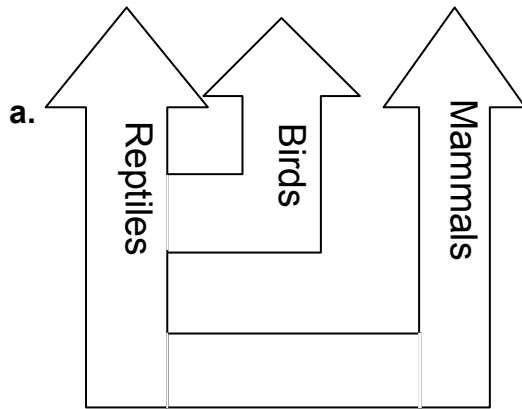
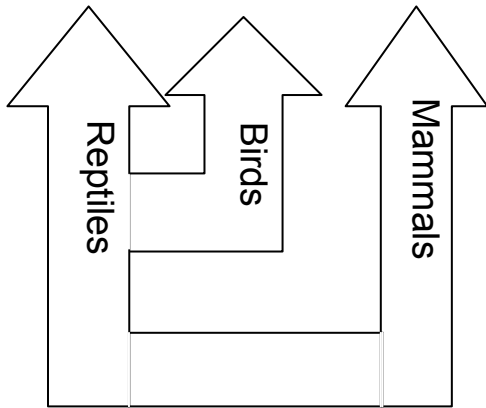
- (A) Both the gymnosperms and angiosperms
- (B) Both the fern and angiosperm
- (C) The fern
- (D) The angiosperm

40. DNA comparisons are commonly used today to classify living things. The table below shows the degree of difference in the DNA of 6 pairs of species, including a newly discovered unknown species. Into which chordate class should this unknown organism be classified?

Pairs of Animals	% Difference in DNA sequence
Elephant / Sparrow	14.2
Elephant / Grass Snake	22.9
Elephant / Frog	27.0
Elephant / Cod	5.1
Elephant / Unknown	21.1

- (A) Amphibia
- (B) Aves
- (C) Osteichthyes
- (D) Reptilia

41. Given the diagram, how might it change if birds gave birth to live young, but still had feathers and did not produce milk?



(A) A

(C) C

(B) B

(D) D

42. Which blood vessel contains oxygenated blood?

(A) Inferior Vena Cava

(C) Right Pulmonary Artery

(B) Left Pulmonary Vein

(D) Superior Vena Cava

43. Which functions to prevent the back flow of blood in the circulatory system?

(A) Arteries

(C) Valves

(B) Capillaries

(D) Veins

44. What is the correct pathway of blood flow through the heart?
- (A) Left Atrium → Left Ventricle → Aorta → Right Atrium → Right Ventricle → Pulmonary Artery → Pulmonary Vein
 - (B) Left Atrium → Left Ventricle → Pulmonary Artery → Pulmonary Vein → Right Atrium → Right Ventricle → Aorta
 - (C) Right Atrium → Right Ventricle → Aorta → Left Atrium → Left Ventricle → Pulmonary Artery → Pulmonary Vein
 - (D) Right Atrium → Right Ventricle → Pulmonary Artery → Pulmonary Vein → Left Atrium → Left Ventricle → Aorta

45. What does a blood pressure reading of 150/80 in an adult indicate?

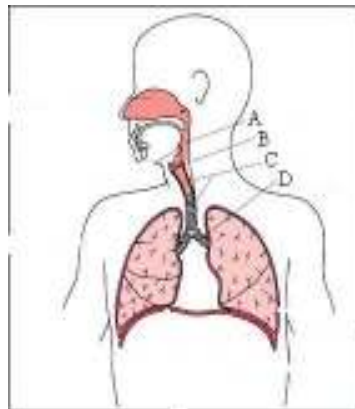
- (A) High Diastolic Pressure
- (B) High diastolic and systolic pressure
- (C) High Systolic Pressure
- (D) Normal blood pressure

46. Which circulatory disorder treatment is illustrated?



- (A) Angioplasty
- (B) Coronary Bypass
- (C) Thrombolytic Therapy
- (D) Shunt

47. Which structure in the diagram below is the bronchus?



- (A) A
- (B) B
- (C) C
- (D) D

48. Which of the following is true during inhalation?

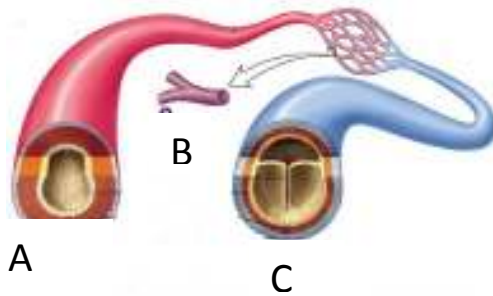
- (A) Air pressure inside the chest is raised
- (B) Diaphragm relaxes and moves upward
- (C) Ribcage moves upwards and outwards
- (D) The epiglottis covers the trachea

49. Which disease of the lungs causes the alveoli to inflame and fill with fluid, impairing the body's ability to receive oxygen?
- (A) Asthma (C) Lung Cancer
(B) Bronchitis (D) Pneumonia
50. Which is a purpose for the digestive process?
- (A) Convert large molecules into smaller molecules for cell use
(B) Filter molecules from blood to remove waste products
(C) Move molecules to the cells for cell use
(D) Remove carbon dioxide from the blood
51. Which functions to prevent food from entering the trachea?
- (A) Epiglottis (C) Pharynx
(B) Glottis (D) Trachea
52. Salivary amylase and pancreatic amylase are important enzymes for which chemical change?
- (A) Fat → Fatty Acids (C) Starch → Water
(B) Protein → Amino Acids (D) Starch → Maltose
53. What is the primary function of the Loop of Henle?
- (A) The filter blood entering the nephron
(B) To remove excess sugar from the filtrate
(C) To remove sodium ions (Na^+) from the filtrate
(D) To remove water (H_2O) from the filtrate
54. Which blood cells originate from the lymph nodes?
- (A) Leucocytes (C) Platelets
(B) Lymphocytes (D) Red Blood Cells
55. Which condition is the result of antibodies attacking the body's own tissues?
- (A) Acquired Immunodeficiency Syndrome
(B) Asthma
(C) Autoimmune Disorder
(D) Inflammatory Response

56. Which of the following is **NOT** an example of the body maintaining homeostasis?

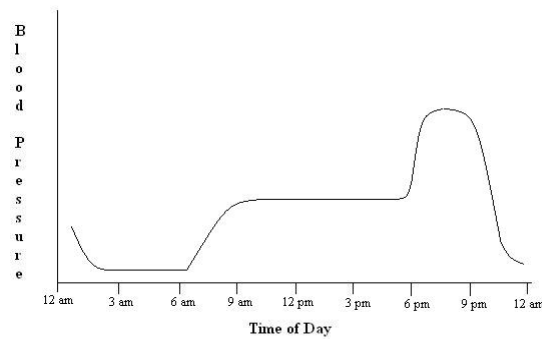
- (A) An allergic response when pollen enters the respiratory tract
- (B) An increased heart rate during exercise
- (C) An increase in antibody production during infection
- (D) Blood vessels in the skin constrict on a cold day

57. Referring to the diagram below, which set of labels is correct?



- | | |
|--|--|
| <p>(A) A = Artery
B = Capillary
C = Vein</p> | <p>(C) A = Capillary
B = Artery
C = vein</p> |
| <p>(B) A = Artery
B = Vein
C = Capillary</p> | <p>(D) A = Vein
B = Capillary
C = Artery</p> |

58. The following blood pressure readings were recorded over a one day period. What is responsible for the readings between 6 and 7 pm?



- | | |
|---------------------------|---------------------------|
| <p>(A) Eating a meal</p> | <p>(C) Reading a book</p> |
| <p>(B) Playing hockey</p> | <p>(D) Taking a nap</p> |

59. Which lung volume is **NEVER** utilized, even during intense physical activity?

- | | |
|---------------------------------------|----------------------------|
| <p>(A) Expiratory Reserve Volume</p> | <p>(C) Residual Volume</p> |
| <p>(B) Inspiratory Reserve Volume</p> | <p>(D) Vital Capacity</p> |

60. Trace the pathway of food through the human digestive system.

- (A) Esophagus → Mouth → Stomach → Small Intestine → Large Intestine
- (B) Esophagus → Stomach → Mouth → Small Intestine → Large Intestine
- (C) Mouth → Esophagus → Small Intestine → Stomach → Large Intestine
- (D) Mouth → Esophagus → Stomach → Small Intestine → Large Intestine

61. A student performed four (4) tests on a piece of food. The results are given:

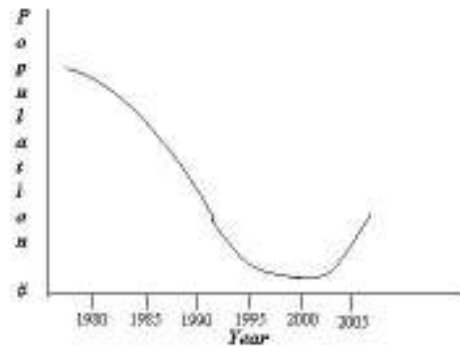
Test	Test Name	Result
A	Benedict's solution	Blue → brown
B	Iodine solution	No change
C	Sudan IV solution	No change
D	Biuret reagent	Blue → purple

Which nutrients are present in the food?

- (A) Monosaccharides & lipids
 - (B) Monosaccharides & proteins
 - (C) Starch & lipids
 - (D) Starch & proteins
62. A man visits his family doctor complaining about stomach pain. His doctor informs him that he has stomach ulcers. Which treatment would his doctor recommend?
- (A) A prescription to increase amylase
 - (B) Corticosteroids to reduce inflammation
 - (C) Drugs to reduce acid production
 - (D) Surgery to remove the gallbladder
63. A person has severe back pain accompanied by blood in the urine, nausea and vomiting. Which disorder is the most likely cause of the symptoms?
- (A) Gall Stones
 - (B) Kidney Stones
 - (C) Ulcerative Colitis
 - (D) Urinary Tract Infection
64. Speculate on the effect that an increase in the number of alveoli will have on the human body's ability to maintain homeostasis.
- (A) The body will need to filter the blood faster
 - (B) The body will require increased amounts of oxygen
 - (C) The rate of gas exchange in the lungs will increase
 - (D) The rate of nutrient absorption in the duodenum will increase

65. Having been on a diet for 6 months, a person is found to have low levels of energy and few triglycerides. What is missing from this person's diet?
- (A) Carbohydrates & lipids (C) Vitamins & minerals
(B) Carbohydrates & proteins (D) Vitamins & water
66. Kidney transplant is the preferred treatment for kidney disease. However, there is a risk of rejection associated with the procedure. What explains this risk?
- (A) New kidney has its own antibodies and attacks the recipient
(B) New kidney induces an autoimmune response in the recipient
(C) New kidney is recognized as an antibody
(D) New kidney is recognized as an antigen
67. A foreign substance enters a human body and is recognized as non-self. Which describes the most likely immune response?
- (A) Cytotoxic T cells will produce memory B cells to remember the foreign substance
(B) Helper T cells will produce cytotoxic T cells to destroy invading viruses
(C) Induced immunity will produce memory T cells to remember the foreign substance
(D) Suppressor T cells will stop the immune system response from destroying viruses
68. Which is an abiotic factor that influences population growth?
- (A) Availability of food (C) Competition
(B) Availability of water (D) Disease
69. Which is a density-dependent factor?
- (A) Climatic conditions (C) Habitat destruction
(B) Competition (D) Overhunting
70. Which is true for a logistic growth curve?
- (A) Exists only in ideal situations (C) J-shaped
(B) Has an equilibrium phase (D) It lacks a lag phase
71. Which stage of the demographic transition model is characterized by a high birth rate and reduced death rate due to improvements in living conditions?
- (A) Stage 1 (C) Stage 3
(B) Stage 2 (D) Stage 4

72. Which population has been affected by a density independent factor?
- (A) Arctic hare population is reduced after a mild winter with little snowfall
 (B) Deer population increases following establishment of a corn farm
 (C) Coyote population increases when mouse birth rate increases
 (D) Moose population decreased as a result of digestive bacterial infection
73. As the coyote population on an island increases the rabbit population decreases. What kind of relationship does this represent?
- (A) competitive (C) host-parasite
 (B) mutualism (D) predator-prey
74. The figure represents the population of the endangered Newfoundland marten in the Main River area. What can be reasonably concluded from the graph?



- (A) Climatic conditions were harsh from 2000 to 2005
 (B) Four breeding pairs were introduced in 2000
 (C) Jobs in forestry increased in 2000
 (D) Water supplies were diverted from the Main River area
75. Which situation below would produce the highest rate of population growth?

	High	Low
(A)	Mortality	Immigration
(B)	Natality	Emigration
(C)	Mortality	Natality
(D)	Emigration	Natality

Part II
Total Value 25%

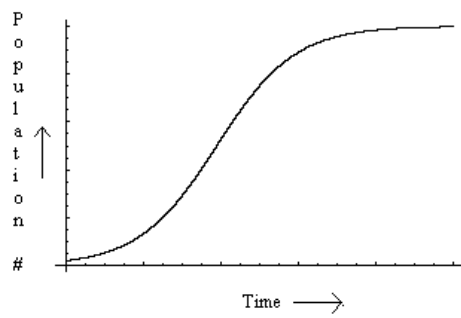
Instructions: Complete all items in this section. Your responses should be clearly presented in a well-organized manner.

1. Discuss the influence of Needham's and Spallanzani's experiment on the debate between abiogenesis and biogenesis. (2 marks)
2. Explain both the beneficial and harmful effects of cholesterol in the diet. (2 marks)
3. Chris views a cell under low power. The field of view is 5 mm. If 12 cells fit across the high power field of view that has a objective lens of 50X and an ocular lens of 15X, what is the length of one cell? (2 marks)
4. Give two reasons why the Phylum Arthropoda can be considered a more successful group than the Phylum Cnidaria? (2 marks)
5. Give two reasons for the trend in the increasing complexity of the Circulatory and Respiratory systems from the fish to the mammals. (2 marks)
6. Given the amino acid sequences in proteins of four organisms.

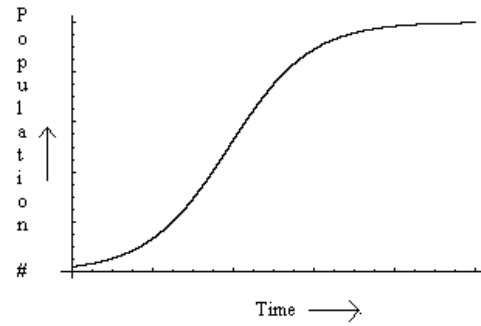
1.	Alanine – valine – leucine – asparagine - cysteine
2.	Leucine – valine – asparagine – tryptophan – isoleucine
3.	Alanine – leucine – asparagine – cysteine - valine
4.	Proline – serine – glutamine – tyrosine - threonine

- A. Determine which 2 organisms would be classified as being most closely related and explain why. (2 marks)
- B. Which type of evidence is used in your classification? (1 mark)
7. Discuss two differences between arteries and veins, with reference to their function in the circulatory system. (2 marks)
8. When a patient undergoes chemotherapy blood counts are regularly performed to closely monitor the numbers of white blood cells. Provide one reason why this would be necessary. (2 marks)
9. Athletes train to improve their circulatory and respiratory systems. Explain how this training helps the athletes perform better during competition. (2 marks)
10. It is a common belief that after surgical removal of the gallbladder, the patient must limit the amount of lipids they consume. What is the biological basis for this belief? (2 marks)
11. Human population continues to grow and technology has allowed humans to push the carrying capacity to new limits. Can this cycle continue indefinitely? Give two reasons to support your answer. (2 marks)

12. The graphs show independent growth patterns for two different species of paramecium that inhabit two different environments. Suggest what would occur if both populations were put together in the same environment. (1 mark)



Paramecium aurelia



Paramecium caudatum