

Answer sheet  
18/9/2018

Mid-Semester Examination, Autumn 2018  
LS1101, Introduction to Biology I

Total Marks: 20  
Name:

Duration: 1 hour  
Roll No.

Section A: Multiple choice or Objective questions. Each correct answer carries 1 mark.

- Eukaryotic cell membranes are composed of
  - Phospholipids
  - Carbohydrates
  - Nucleic acids
  - Peptidoglycans
- In which of the cells would you expect the DNA to be partitioned into its own specific area of the cell?
  - The archaean *T. acidophilum*
  - The bacterium *H. pylori*
  - The bacterium *S. aureus*
  - The amoeba *A. protea*
- The swan neck flask experiment was performed by \_\_\_\_\_ to disprove the theory of spontaneous generation
  - Oparin and Haldane
  - Darwin
  - Aristotle
  - Louis Pasteur
- One of the earliest sources of energy was/were
  - Green plants
  - Carbon dioxide
  - Chlorophyll
  - UV rays and lightening
- Smooth endoplasmic reticulum is the site of
  - Protein synthesis
  - Carbohydrate synthesis
  - Lipid synthesis
  - Amino acid synthesis
- An interaction between two individuals/populations where both are benefitted is
  - Commensalism
  - Parasitism
  - Mutualism
  - Amensalism
- Reproductive isolation, leading to speciation can be achieved through
  - Genetic isolation
  - Behavioural isolation
  - Geographical isolation
  - All of the above
- The first forms of life were most likely to have been
  - Autotrophs
  - Cyanobacteria
  - Chemoheterotrophs
  - Eukaryotes
- \_\_\_\_\_ was absent in the atmosphere at the time of origin of life
  - H<sub>2</sub>
  - O<sub>2</sub>
  - CH<sub>4</sub>
  - NH<sub>3</sub>
- Species that are generally highly connected within the food web and whose loss may result in ecosystem collapse
  - Indicator species
  - Keystone species
  - Apex species
  - Dominant species

## Section B

**Part 1. Answer any two of the following questions. Answer each question within less than a page.**

1. Who first proposed the theory of spontaneous generation? What was the basic idea of this theory? How was this proved/ disproved by biologists in the 18<sup>th</sup> and 19<sup>th</sup> century? (3)
2. Explain briefly the four main factors that work together on populations and finally drive biological evolution and its present-day diversity? (3)
3. The endomembrane system consists of a group of membranous subcellular structures. Which organelles are a part of this system? Explain briefly (in a line or two) the role of each in carrying out cellular functions. (3)
4. Ecological communities are shaped by a variety of direct and indirect interactions between individuals. What are the broad kinds of direct interspecific interactions found between individuals? Explain briefly, with examples (at least one for each kind). (3)

**Part 2. Answer any two of the following questions. Answer very briefly.**

5. What is the theory of Chemical Evolution? Who tested this experimentally for the first time and what did they find? (2)
6. What is the most likely life form to have evolved first? What are the characteristics of this organism in terms of their cellular organisation, method of obtaining energy and nature of replicating unit? (2)
7. Scientists generally believe that eukaryotes evolved from prokaryotes. What is the theoretical basis for this idea? What evidences do we find in modern day eukaryotic cells that support this theory? (2)
8. What is the basic composition of cell membranes? What is the importance of membranes and compartmentalization to eukaryotic cells? (2)