

## Exam Review for SBI3U

### Diversity

Terms:

- binomial nomenclature
- biodiversity
- unicellular
- multicellular
- dichotomous key
- prokaryote
- eukaryote
- virus
- bacteriophage
- species
- organism
- lytic /lysogenic
- taxonomy
- phylogeny
- symmetry
- autotroph
- heterotrophy

Sample questions:

1. Use the principles of binomial nomenclature. How are the organisms scientifically named according to binomial nomenclature?
2. Why do we need a system for classification?
3. Explain the lytic and lysogenic cycles for viruses.
4. How are bacteria and viruses harmful? Helpful?
5. What are the 7 taxonomic divisions?
6. Use a dichotomous key to identify organisms.
7. Know examples and some characteristics for the various Kingdoms:
8. What are the 2 bacterial kingdoms? What are the shapes of bacteria (ie. Staphylococcus, etc)
9. What are the different methods of bacterial reproduction?
10. What features/characteristics separate the Kingdom Protista from others?
11. How are fungi different from plants?
12. What features are shared by all organisms in the animal kingdom?
13. State 4-5 things about the following KINGDOMS: Animalia, Plantae, Protista, Archaeobacteria, Eubacteria, Fungi
14. State a characteristic and a representative organism for each of the following PHYLA: Arthropoda, Cnidaria, Mollusca, Chordata
15. What does radial and bilateral symmetry refer to in Kingdom Animalia?

### Genetics

Terms:

- karyotype
- mitosis
- autosomal
- trait
- recessive
- co-dominance
- pedigree
- asexual
- chromosome
- chromatin
- chromatid
- incomplete dominance
- carrier
- haploid (n)
- trisomy
- multiple alleles
- alleles
- cell cycle
- sex-linked
- monohybrid
- homozygous
- centromere
- paternal
- maternal
- gametes
- dihybrid
- heterozygous
- DNA
- double helix
- Diploid (2n)
- monosomy
- phenotype
- genotype
- oocyte
- oogenesis
- spermatocyte
- spermatogenesis
- blood groups
- homologous pairs
- crossing over
- synapsis
- DNA fingerprint
- transformation
- clone
- vector
- meiosis
- zygote
- gene
- Punnett square
- dominant
- variation/genetic diversity
- sister chromatid
- tetrad
- nucleotides
- nondisjunction
- A,T,G,C
- gene therapy
- polar bodies

Sample Questions:

1. Who was Mendel? Why is he considered the father of genetics?
2. Explain Mendel's laws of segregation.
3. If you were to cross short haired rabbits (SS or Ss) with long haired rabbits(ss) and looked at the offspring, how could you tell if:
  - a. Normal rules of dominance apply?
  - b. Incomplete dominance was occurring?
  - c. Co-dominance was occurring?
4. If a horse has long ears (a dominant characteristic), how can you determine if its genotype was homozygous or heterozygous? Explain and show your work. (ie test cross)
5. Explain multiple alleles in terms of human blood types. Be able to complete blood type problems.

6. Use a pedigree to determine genotype and if a trait is sex-linked or autosomal, recessive or dominant. Be able to complete sex-linked problems using Punnett squares (ex. colourblindness, hemophilia)
7. What is a dihybrid cross? How is it different from a monohybrid cross? Make sure you know how to determine the F1 and F2 genotypic and phenotypic ratios of dihybrid crosses.
8. What are the advantages of sexual reproduction over asexual?
9. Know the stages of mitosis and meiosis. Compare/contrast these two processes. What are the possible outcomes of abnormal meiosis?
10. What is the structure of DNA? What do A, G, T, C mean and how are they arranged in DNA?
11. Blood types – how is this an example of both codominance and dominance (p.195)

## Animal Systems

Terms:

### **DIGESTIVE:**

- amylase
- bile
- capillary
- duodenum
- ileum
- jejunum
- ascending, transverse, and descending colon
- esophagus
- stomach
- gastrin
- pepsin
- gall bladder
- bicarbonate ions
- HCl
- hormone
- liver
- pyloric sphincter
- gastroesophageal sphincter
- villi
- absorption
- digestion
- egestion
- ingestion
- lacteals
- peristalsis
- trypsin
- secretin
- CCK
- pancreas
- pH
- lipase
- carbohydrates

- protein
- peptide
- amino acid
- monosaccharide
- disaccharide
- polysaccharide
- fat
- triglyceride
- fatty acid
- glycerol
- glucose
- bolus
- epiglottis
- saliva
- mucus
- trypsin
- pepsin

- spleen
- thymus
- antibody
- antigen
- aorta
- vena cava
- atrium
- ventricle
- vasodilation
- AV valve
- valves (vein)
- semi-lunar valve
- pulmonary artery
- pulmonary vein
- diastole
- systole
- erythrocyte

### **CIRCULATORY:**

- plasma
- arteries
- veins
- capillaries
- pulmonary circuit
- systemic circuit
- hemoglobin
- anemia
- leukocytes
- lymphocytes
- platelets
- vasoconstriction
- cardiac output
- systolic pressure
- diastolic pressure
- lymph

### **RESPIRATORY:**

- diaphragm
- trachea
- bronchi
- nasal cavity
- gas exchange
- larynx
- inhalation
- exhalation
- alveoli
- trachea
- bronchioles
- pharynx
- epiglottis

Sample Questions

Digestion Review:

1. Explain the 4 stages of digestion
2. Digestive enzymes/juices - explain how pH affects the activity of different enzymes
3. Compare digestive systems of simple vs. complex organisms
4. Identify digestive organs, their structure and role and how they work together.
5. Digestion of carbs, fats, protein - identify organs of digestion for each and enzymes involved.

## Circulation Review

1. Explain the flow of blood through the heart to parts of the body (including lungs)
2. Compare structure and function of veins, capillaries, arteries.
3. Compare structure and function of rbc(erythrocytes), wbc (leukocytes), and platelets.
4. What are the main functions of blood?
5. What is the purpose of the lymphatic system?
6. Diseases of the circulatory system: hypertension, arterosclerosis, CAD
7. Structure of heart - label

## Respiration Review

1. Explain what steps and muscles are involved in breathing.
2. .How is the air that is inhaled different than the air that is exhaled? (i.e. in terms of Carbon dioxide and oxygen concentrations, for example)
3. .Explain the process of gas exchange and the transport of gases (ie. Partial pressure)
4. Explain what happens in the alveoli.
5. Trace the pathway of an oxygen molecule from the external environment to the cell.
6. Trace the pathway of a carbon dioxide molecule from the cell to the external environment.
7. How is the structure of the trachea/bronchi well suited to its function?
8. Label respiratory system diagram

## Evolution

### Terms:

- beneficial mutation
- neutral mutation
- harmful mutation
- artificial selection
- biogeography
- Charles Darwin
- homologous feature
- analogous feature
- natural selection
- survival of the fittest
- the modern theory of evolution
- directional selection
- stabilizing selection
- disruptive selection
- sexual selection
- genetic drift
- genetic bottleneck
- founder effect
- speciation
- divergent evolution
- convergent evolution

### Questions:

1. Outline the ideas and contributions of Buffon, Lamarck, E. Darwin and Linnaeus, Cuvier and Lyell that lead to Darwin's theory of evolution by natural selection.
2. What are the advantages and limitations of artificial selection?
3. What are the potential effects of mutations on a species? How do they affect reproductive success? Which type is most common? Will the mutation become more or less common in future generations? Why?
4. Differentiate between homologous, analogous and vestigial features. How do these types of features support the theory of evolution?
5. Why is competition within a species a key factor in evolution by natural selection?
6. What observations and inferences did Darwin make while proposing the theory of evolution by natural selection? Define Darwin's theory of evolution by natural selection.
7. Give 4 examples of observations that could falsify Darwin's theory of evolution.
8. Differentiate between and give examples of the 3 following patterns of natural selection – directional, stabilizing and disruptive
9. What is sexual selection? How does this influence natural selection? Give an example.
10. What are some ways that evolution can occur without natural selection? Differentiate between the three ways.
11. What is speciation? What are some modes of speciation? Identify the different mechanisms in each mode of speciation.
12. What are some patterns of evolution? Differentiate between adaptive radiation, divergent, convergent and coevolution.