

SBI3U June 2002 EXAM REVIEW

*Your exam will be written on Thursday, June 17 at 12:30PM - 2:30 PM
in the GYM in Row _____*

There are four sections:

SECTION I	Multiple Choice (50 questions)	50 marks
SECTION II	Short Answer (32 questions)	100 marks
TOTAL	(30% of the final mark)	150 marks

For your exam, you should be able to:

UNIT I Cellular Functions (33 marks)

Chapters 1, 2, and 3

1. Identify and describe the structure and function of carbohydrates, lipids, proteins, and nucleic acids.
2. Describe how to determine the presence of glucose, starch, lipid, and protein in various samples.
3. Describe the **fluid-mosaic model** of the cell membrane.
4. Explain the various transport methods including **diffusion, osmosis, facilitated diffusion, active transport**.
5. Explain the movement of water with reference to cells in **hypertonic, hypotonic, and isotonic** environments and how cells respond to such environments (i.e. lysis and plasmolysis).
6. Explain the processes of **endocytosis** (phagocytosis and pinocytosis), **receptor-mediated endocytosis** and **exocytosis**.
7. Identify the basic features of **eukaryotic** and **prokaryotic** cells.
8. Describe the structure and function of organelles and other cell structures.
9. Describe how cell structures work together to carry out **protein synthesis** and **lysosomal digestion**.
10. Identify cell organelles given a generalized cell model.
11. Explain the relationship among cells, tissues, organs and organ systems.
12. Identify the raw materials and end products of **photosynthesis** and **cellular respiration**.
13. Explain the process of cellular respiration.
14. Explain the process of **fermentation**.
15. Compare **anaerobic** and **aerobic respiration**, according to the starting materials, products and amount of **ATP** produced. State the advantages and disadvantages for an organism or tissue of using either process.

UNIT II Genetic Continuity (32 marks)

Chapters 4, 5, 6 and 7

1. Define or explain the following terms: **gene, allele, homozygous, heterozygous, hybrid, dominant, recessive, genotype, phenotype**.
2. Give appropriate lettered symbols to represent **alleles** and **genotypes**.
3. Describe the **phenotype** given a **genotype**. Determine the **genotype(s)** given a **phenotype**.
4. Solve problems involving **monohybrid crosses** using a **Punnett square**.
5. Calculate the probability of an event occurring and the probability of two or more independent events occurring together.
6. Determine the kinds of sex cells **dihybrid** individuals can produce.
7. Solve problems involving **dihybrid crosses** using a **Punnett square**.
8. State the characteristics and solve problems for **incomplete dominance** or **codominance**.
9. Solve problems involving **multiple alleles** (example the human ABO blood group system).
10. Recognize that DNA replication for cell division occurs during interphase.
11. Demonstrate an understanding of the process and importance of mitosis.
(e.g. cell division and the phases of mitosis).
12. Draw and label diagrams of the four stages of mitosis.
13. Explain the terms: **diploid, haploid, 2n and n number of chromosomes, homologous chromosomes, synapsis and tetrad**.
14. Explain the process of meiosis in terms of the replication and movement of chromosomes.
15. Draw and label diagrams of the many stages of meiosis.

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16. State the significance of **crossing over** and **random assortment** during meiosis.
17. Compare the processes of mitosis and meiosis.
18. Explain the concept of **sex-linkage** and solve sex-linkage problems using a Punnett square.
19. Predict the outcome of a sex-linkage cross.
20. Describe genetic disorders involving autosomal and sex-linked inheritance (e.g. Tay-Sachs disease, PKU, sickle-cell anemia, Huntington disease, progeria, hypercholesterolemia, Duchene Muscular Dystrophy, Down Syndrome, etc...).
21. Describe the use of technology in detecting genetic disorders (e.g. karyotype analysis).
22. Be able to determine the inheritance pattern of human traits using a **pedigree** (e.g. autosomal or sex-linked).

UNIT III Internal Systems and Regulation (33marks)

Chapters 8, 9, and 10

1. Describe the requirements for an efficient respiratory system.
2. Describe the pathway of oxygen from the atmosphere to the cell including the roles of **ventilation**, **hemoglobin**, and **diffusion** in this process.
3. Identify the role played by each part of the respiratory tract and label a diagram of the human respiratory tract.
4. Distinguish between the concepts of **breathing** and **respiration**, as well as **internal** and **external respiration**.
5. Describe the muscular processes involved in breathing.
6. Define and calculate **inspiratory reserve volume**, **expiratory reserve volume**, **tidal volume**, **residual volume**, **vital capacity** and **total lung volume**.
7. Explain how the act of breathing is controlled.
8. Describe the major processes and mechanisms for **gas exchange** in plants (e.g. root hairs, lenticels, and stomata).
9. Explain the role and/or functions of transport or circulatory systems in the transport of substances in an organism.
10. Explain how different types of blood vessels contribute to the circulatory system.
11. Trace the pathway of circulation through the mammalian heart.
12. Identify and label on a diagram the major compartments of the heart and its associated blood vessels.
13. Describe how the heart rate is controlled and regulated.
14. Identify and distinguish between the two types of transport tissues in plants.
15. List, in order, the structures through which food passes in the human digestive tract as well as label a diagram of the human digestive system.
16. Describe and give the functions of structures in the digestive system.
17. Explain how food moves through the digestive tract.
18. Identify and describe examples of enzymes that act in the mouth, the stomach and the small intestine, including the substrates they act on and their products.
19. Compare and contrast the anatomy of a fetal pig to the anatomy of a human.

UNIT IV Diversity of Living Things (25 marks)

Chapters 11, 12, and 13

1. Identify the levels of classification (taxa) from general to specific.
2. Explain how species are categorized and named according to **taxonomy** and **phylogeny**.
3. Compare and contrast structure and function of **prokaryotic** and **eukaryotic** cells.
4. Describe the characteristics of representative organisms from each life Kingdom and a representative virus.
5. Classify representative organisms from each life Kingdom.
6. Compare and contrast the life cycles and methods of reproduction of representative organisms from each life Kingdom and a representative virus.
7. Compare and contrast the **lytic cycle** and the **lysogenic (retrovirus) cycle** of a virus; be able to draw labeled diagrams of these cycles.

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UNIT V Plants (27 marks)

Chapters 14 and 15

1. Stems
 - differences between monocot and dicot
 - differences between **herbaceous** and **woody**
2. Roots
 - longitudinal section
 - structure of root in cross section comparing monocot to dicot
3. Identify and label cross sections of stems and roots.
4. Structure and functions of leaves.
 - differences between monocot and dicot
5. Seed structure
 - parts of a seed
 - differences between a monocot and a dicot seed
6. List the differences between **monocots** and **dicots**.
7. Describe the differences and similarities between **xylem** and **phloem**.
8. Describe the effects of growth regulators such as auxin.
9. Define and give examples of various plant responses, i.e., tropisms and nastic movement.