

Biology study guide

Go over study booklets of both cxc practice questions and O level questions.

Topics to go over for **multiple choice**:

- Human impact on the environment
- Renewable and Non-renewable resources
- Cell organelles and function
- Osmosis, diffusion and active transport
- Population growth and its effects
- Classification of organisms
- Population density calculations
- Abiotic and biotic factors.
- Food web and trophic levels.
- Photosynthesis and Respiration rate (graph)
- Experiment on carbon dioxide for photosynthesis
- Food testing on starch, reducing sugar, protein etc..
- Photosynthesis and the internal structure of a leaf.
- Anatomy of the tooth
- Food groups linked to hypertension and diabetes.
- Enzymes- salivary amylase
- Deficiency osteomalacia or rickets, anemia, nightblindness, scurvy
- Respiration: gaseous exchange structures (human, fish, plant, amoeba)
- Role of respiration
- Transport in animals (amino acids, hormones, sucrose, respiratory gases)
- Vitamins and minerals involved in blood clotting
- Transpiration rate in sunny and windy conditions.
- Translocation of sucrose in plants
- Movement in plants
- Function of kidney nephron (processes involved – ADH)
- Stimulus and response
- Reflex arc
- Skeletal system functions.
- The skin and its parts
- Menstrual cycle (Corpus luteum and Graafian follicle)
- Parts and functions of the eye
- Fertilization in plants, parts of a flower
- Contraceptives
- Vectors and diseases, malaria, yellow fever virus, dengue
- Blood groups and genetic crosses
- DNA, Chromosomes, Gene and allele.
- Variation
- Mitosis, meiosis
- Natural and artificial selection
- Alveoli (respiration)
- Blood clot process
- Kidney dialysis machine (inputs, outputs, clean blood)
- Effects of adrenaline to the body
- nitrogen cycle
- Genetic cross and pedigree chart.

Topics to go over for **Short answers: Possible topics and questions.**

- **Enzymes- plotting graphs, effects on temperature. Enzymes on protein**
- **Cells: Animal cell, Plant cell and prokaryotes (bacteria), Osmosis and its effects on plants and animals**
- **Kingdom of classification of living organisms, Species, Morphology and physical appearance, how to identify organisms belonging to the same species.**
- **Use of biological concepts of species instead of physical characteristics to classify organisms.**
- **Reasons of reclassifying organisms using biological concepts of species.**
- Pathway of blood through the heart to the lungs and back to the heart.
- Physiological diseases that affect the circulatory system.
- Chemotherapy is a treatment that destroys both the malignant (bad) cells and the good cells in the body. Explain why a person undergoing chemotherapy would have decreased natural immunity.
- Benefits of antiserum injection instead of a vaccine.
- Genetic engineering used to produce human insulin using the bacterium *E. coli*.
- Three differences between genetic engineering and artificial selection used by farmers to produce improved varieties of crop plants.
- Advantages of using genetic engineering to produce insulin.
- Theory of natural selection to explain “antibiotic resistance”
- Reproductive system and its parts
- Fertilization and implantation.
- Outline the mechanism by which male and female gametes come together in the human reproductive system to form a zygote.
- cell division involved in gamete formation.
- Two ways cell division differs from a zygote and that of an embryo.
- Embryonic stem cells are undifferentiated cells formed as the embryo grows and develops. These cells are capable of differentiating into specialised cells of tissues and organs in the human body.
- Reasons why cell specialization is important?
- Why embryonic stem cells can be used in the treatment of physiological diseases.
- Explain how structures in the human eye control the amount of light that enters the eye.
- Jenny enters a dimly lit room and cannot see that colours of the furniture until the lights are switched on. Explain how Jenny is able to discern objects in the dimly lit room but cannot see the colours until the lights are switched on.
- A certain form of colour-blindness is inherited as a recessive allele carried on the X chromosome. It is thus said to be ‘X-linked’ or ‘sex-linked’. A woman with normal colour vision, whose father is colour-blind, mates

with a colour blind man. What is the chance of them having colour-blind children? Use a genetics diagram to explain your answer.

Use **B** for the allele for normal vision and **b** for the allele for colour-blindness

Albinism is seen in persons who are homozygous for recessive allele of a certain gene. This gene codes for the production of the skin pigment, melanin. Persons who inherit the dominant allele of this gene produce normal amount of melanin for their race.

(a) Distinguish between the following paired terms:

- Allele / Gene:

- Dominant / Recessive:

- Homozygous / Heterozygous

(6 mks)

(b) (i) Use a genetic diagram to show how a couple with normal pigmentation may produce an albino child. Use the following symbol to represent the alleles:

A- Normal ; a- albino. (4 mks)