

BIOLOGY III 2002-2003

SECTION A

ANSWER 001

a) **AIDS** stands for
Acquired Immuno-deficiency Syndrome

b) the difference between AIDS and HIV is that :
HIV is a causing agent, meaning the virus which
Cause such disease (AIDS).

AIDS is a set of symptoms due to the infection by H.I.V.

ANSWER 002

i)x :SPORE
Z: SPORANGIUM

ii) During feeding of a fungus, the hyphae releases
Enzymes to digest or to decompose soluble organic matter into
materials that can be absorbed the fungus

ANSWER 003

2)A butterfly differs from a moth in that :

BUTTERFLY	MOTH
pointed antennae or thread-like at the end	-crusted antennae
Fly at night (nocturnal)	Fly during the day
Horizontal wings at rest	Vertical wings at rest
Large scales	Small and fine scales

ANSWER 004

Main stages of incomplete metamorphosis:
Egg....Larvus....Imago(Adult insect)

ANSWER 005

Blood functions include:

- Transport of oxygen.
- Transport of carbon dioxide.
- Transport of digested food materials.
- Transport of urea.
- Distribution of heat.
- Protection against diseases.

ANSWER 006

- a) After exercise, sportsmen are given glucose and not sucrose because sucrose has been decomposed into glucose to be used.
- b) Products of glucose oxidation are:
- Energy.
 - Water.
 - **Carbon dioxide.**

ANSWER 007

a) Plant cells differ from animal cells as follows:

b)

PLANT CELL	ANIMAL CELL
Cellulose cell wall	Absent
No centrioles	Absent
Plasts present	Plasts absent

b) Common structures for both animal and plant cells are:

- Cell membrane.
- Cytoplasm.
- Nucleus
- Mitochondria
- Ribosomes.
- Endoplasmic reticulum.
- Vacuoles.
- Golgi apparatus

ANSWER 008**Excretory organs and respective excretory products:**

EXCRETORY ORGANS	EXCRETORY PRODUCTS
Lungs	Carbon dioxide
Liver	Bile
Kidneys	Urea and uric acid
Skin	Sweats
Large intestine	Feces

ANSWER 009**The following are functions of skin:**

- Protection.
- Reception of external stimuli (sensitivity)
- Excretion.
- Thermal regulation.
- Production of vitamin D on exposition to the light.
- Respiration.
- Reserve of fats.
- Defense against microbes.

ANSWER 010

Enzymes produced by pancreas are:

- Insulin: decrease the excess glucose in the blood.
- Glucagon: increase the level of glucose in the blood.

ANSWER 011

a) The initial organism in a food chain is a green plant (producer) which is autotrophic that can produce organic matter.

b) Given the food web:

i) The primary consumers are small insect, caterpillar, rabbit.

ii) The secondary consumers are large insect, small bird, hawk.

c) If small insects died, there will be:

- Proliferation of green plant.
- Regression of large insects and small bird.

ANSWER 012

a)i) With nitrates, plants synthesize aminoacids .

ii) With Magnesium, plants ensure composition of chlorophyll.

b)Importance of water to plants :

- Reactant in the photosynthesis.
- Transport of mineral salts.
- Turgescence .
- Growth of the plants.
- Solvent.

c)i) Water travels up the plant through the xylem

ii) Sugar (glucose) travels down the plant through the phloem.

ANSWER 013

The main classes of phylum Artropoda are:

- Crustaceans.
- Insects
- Arachnid.
- Myriapoda

ANSWER 014

Feeding habits of birds:

BEAK	FEEDING HABITAT	REASON
A	Carnivore	Uses its beak to kill its prey and removes meat from bones
B	Granivore	Uses its beak to break hard seeds.
C	Nectarian	Uses its beak being long to suck nectar from flowers

ANSWER 015

Characteristics of class insecta are :

- Possess antennae.
- Possess 3 parts of the body
- Possess articulated appendices.

SECTION B

ANSWER 016

a) Human senses and their respective receptors:

SENSE	RECEPTOR
Taste	tongue
Hearing	ear
Sight	eye
Touch	skin
Smell	nose

b) Excitation.....Skin receptors.....sensitive nerve.....motor cells (in spinal cord).....Brain.

Or the sensory cells pass the nervous impulses to the brain through sensitive nerve.

ANSWER 017

a) Mitosis occurs in all organs of both animal and flowering plants.

b) The following are some importance of mitosis to the living organisms:

- Mitosis maintains the number of chromosomes.
- Mitosis is responsible for growth.
- Mitosis assures replacement of dead cells.

c) i) Because the genes (alleles) for white flowers are recessive to the genes(alleles) for the red flowers which are dominant : the red character dominates the white.

ii) Suppose that the gene R represent the red flower and b the white flower.

*The genotype of the red flowers is **RR**.

*The genotype of the white flowers is **bb**

With crossing:

	b	b
R	Rb	Rb
R	Rb	Rb

ANSWER 018

a) **An enzyme** can be defined as an organic substance catalyst, of protein nature.

b) **The characteristics of enzymes are:**

- Enzymes are specific.
- Enzymes are denatured by high temperature.
- They increase the rate of reaction without changed (remain unchanged at the end)
- The presence of enzyme does not change the nature of product of reaction (it is not a reactant)
- Only small quantity is necessary.
- Their activity varies with the PH.
- Their reaction is eversible.

c) The role played by enzymes in germination: Degradation (hydrolysis, transformation) of reserve organic substances into simple substances for development of young plant.

Or Enzymes decompose starch in the maize into glucose during germination.

ANSWER 019

a) Some examples of micro-organisms are:

- Algae.
- Microscopic fungi.
- Bacteria.
- Virus.
- Protozoans.

b) Their importance to man are:

- Fermentation.
- Recycling of matter.
- Used in pharmacology.
- Pharmaceutical production.

ANSWER 020

i) Malaria is caused by a protozoan called Plasmodium.

ii) The following are some of the methods employed (used) to eradicate malaria in the villages:

- Remove stagnant water.
- Sleeping under mosquito nets.
- Closing windows earlier in the evening.
- Use medicines against malaria.

iii) Steps taken by the government to reduce malaria infection:

- Sensibilize : workshops against malaria
- Distributing supernets at affordable prices .
- Importation of medicines against malaria.
- Establishment of P.N.L.P.

BIOLOGY III 2003-2004

SECTION A

ANSWER 001

- Reproduction.
- Automatic response (irritability).
- Growth.
- Nutrition
- Gaseous exchange (respiration)
- Excretion..

ANSWER 002

a) Some of diseases spread by flies are:
Typhoid, cholera, diarrhea, dysentery.

b) Ways to prevent such diseases are:
-Cover the food.
-Cover toilets.

ANSWER 003

Organisms and their respective groups:

ORGANISMS	GROUPS
Trichomonus	Flagella
Amoeba	Rhizopoda
Paramecium	Ciliophora
Plasmodium	Sporozoa

ANSWER 004

- i) Name : Millipeda
ii) The feeding habitat is a herbivore.

ANSWER 005

- A:** Name: Kidney
Function: -Filtration of blood.
-Elimination of water.
-Production of urine
-Excretion of urea.

- B:** Name is urethra
Function: Conducts urine from kidney.

- C:** Name is bladder.
Function: Storage of urine.

ANSWER 006**Leaf adaptations to photosynthesis:**

- Large surface of the leaf.
- Presence of stomata to facilitate exchange of gases.
- Palisade cells containing chloroplasts with a good aspect of receiving photons.
- Presence of xylem tissue to conduct water and mineral salts to all cells of the leaf.
- Leaves are thin to reduce distance thus giving easy diffusion of gases.
- Leaves are well arranged on branches for easy exposure to sunlight.

ANSWER 007

a)i) Dominant: This is applied to the genes which show their effect at a heterozygous state.

ii) Recessive: Genes which show their effect at a homozygous state.

b) Descendants of F₂ generation : $\frac{3}{4}$ and $\frac{1}{4}$

*Round seeds: $7524 \times \frac{3}{4} = 5643$

*Wrinkled seeds: $7524 \times \frac{1}{4} = 1881$.

ANSWER 008

*Pollination may occur without fertilization taking place because the pollen grains can be transferred from anthers to the stigma and could not germinate to the stigma along the style as to become finally micropyle.

*Fertilization cannot take place without pollination because the pollen grain can be deposited on the stigma from these and grow along the style until when fertilization occurs.

ANSWER 009

i) The type of reproduction shown is asexual reproduction or vegetative reproduction.

ii) Advantages of asexual reproduction are:

*Only one parent required

*Parents and descendants share same characters

*Rapid reproduction.

ANSWER 010

Common characteristics of insects are :

- *Possess articulated legs.
- *Posses 3 pairs of legs.
- *Body divided into 3 parts: Head, thorax, abdomen.

ANSWER 011

FEEDING LEVEL	ORGANISM
Herbivore	Periwinkle
Producer	Seaweed
Secondary consumer	Starfish, crab, octopus
Top carnivore	Seal, seagull
Primary consumer	Limpet, periwinkle

ANSWER 012

- a) A: Stomach.
 B: Pancreas
 C: Large intestine (colon)

b)-Secretion
 -Absorption.

c) The function of fiber in the human diet is to facilitate the digestion.

d) The functions of pancreas are :
 Secretion of digestive enzymes.
 Secretion of hormones.

SECTION B

ANSWER 013

a) The components of human blood:

- Red blood cells (erythrocytes).
- White blood cells (leucocytes)
- Platelets.
- Plasma.

Component	Function
Red blood cells	Transport of CO ₂ and O ₂
White blood cells	Defense of organism
Platelets.	Coagulation of blood.(blood clotting)
Plasma.	Solvent (medium of all reactions)

b)* Unicellular organisms such as amoeba do not need a transport system because they are made up of only one cell.

*Only one cell thick: the process of diffusion is effective.

ANSWER 014

a) Organisms and their feeding level:

ORGANISMS	FEEDING(TROPHIC) LEVEL
A	Secondary consumer
B	Primary consumer (herbivore)
D	Producer(autotrophic)
E	-Tertiary consumer since it consumes A -Secondary consumer with respect to C.
F	Primary consumer (herbivore)

b) Removing organism G from this food web, results into:

- Increase** of E.
- Decrease** of A,B and C.
- Increase** of D and F.

ANSWER 015

a) The main components of gastric juice are:

- Hydrochloric acid** (HCl).
- Renin**.
- Pepsin**.

b) Functions of HCl :

- *Reactivation of pepsinogen and pepsin which digest proteins.
- *Converts complex sugars into simple ones.
- *Stops the action of ptyalin,
- *Destroys bacteria present in food.
- *Appropriate medium for pepsin and renin.

***Functions of pepsin:** Converts proteins into peptides.

***Function of rennin:** Act on liquid proteins converting them into solid proteins to be treated by pepsin.

ANSWER 016

a) Plants with red flowers x plants with white flowers.

Plants with red flowers.

Explanations

The genes for red flowers are dominant over genes for white flowers **which** are recessive. These can not express themselves at heterozygous **state**.