THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/1

BIOLOGY 1
(For Both School and Private Candidates)

Time: 3 Hours **Wednesday, 04th November 2015 a.m.**

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in section A and B and **one (1)** question from section C.
3. Except for diagrams that must be drawn in pencil, all writing should be done using a blue or black pen.
4. Calculators and cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

SECTION A (20 Marks)

Answer **all** questions in this section.

1. For each of the items (i) – (x), choose the correct answer among the given alternatives and write its letter beside the item number in the answer booklet provided.

(i) The Bowman's capsule is found in which of the following organs?
A Liver B Pancreas C Kidney
D Spleen E Heart.

(ii) Which of the process is involved in regulation of body temperature in human beings?
A Urination B Painting C Deamination
D Sweating E Detoxification.

(iii) A structure that allows air to enter the trachea and prevent food from entering the wind pipe is known as
A glottis B tongue C soft plate
D mouth E epiglottis.

(iv) Study the following sequence of organisms:
Grass ⟶ Rabbit ⟶ Wolves ⟶ Fleas.
The sequence is an example of
A food web B ecosystem C a pyramid
D food chain E abiotic.

(v) Lipase enzymes are mainly contained in which digestive secretions?
A Hydrochloric acid B Gastric juice C Saliva
D Intestinal juice E Pancreatic juice.

(vi) A person who is admitted in the hospital after an operation will mostly be likely to be fed on food rich in:
A vitamin C B vitamin A C protein
D lipids E water.

(vii) Which of the following is a vector of sleeping sickness?
A House fly B Mosquito C Tsetse-fly
D Tick E Cockroach.

(viii) The outer most living structure that identify a plant cell is the presence of
A cytoplasm B vacuole C cell wall
D nuclear membrane E cell membrane.

(ix) One of the distinctive feature used to place organisms in the Kingdom Fungi is the presence of
A gill structures B hyphae C cellulose
D cap E exoskeleton.

(x) Which of the following represent the organisms with homologous structures?
A Wings of Birds and Butterfly
B Forelimbs of Bird and Bat
C Tail of Rat and Scorpion
D Sting of Honey bee and Mosquito
E Beak of Duck and Hen.

2. Match the phrases in **List A** with the responses in **List B** by writing the letter of the correct response from **List B** beside the item number of **List A** in your answer booklet.

	List A	List B
(i)	A stage of growth in human, characterised by rapid growth and a lot of physical and mental changes.	A Meiosis
(ii)	A type of seed germination whereby cotyledons are pushed above the ground.	B Metamorphosis
(iii)	The ability of seed to germinate.	C Radicle
(iv)	The region of most active growth in plant.	D Plumule
(v)	A type of seed germination whereby cotyledon remains beneath in the ground.	E Hypogeal germination
(vi)	A pore which allows water into a seed during germination.	F Adulthood
(vii)	Inability of a seed to germinate.	G Dormancy
(viii)	Prevents a viable seed from germinating.	H Epigeal germination
(ix)	A stage of family formation and parenthood in growth and development.	I Adolescent
(x)	A type of cell division whereby the number of chromosomes is maintained from parent cell to daughter cell.	J Cotyledon
		K Mitosis
		L Micropyle
		M Hard seed coat
		N Stem and root apices
		O Viability

SECTION B (60 Marks)

Answer **all** questions in this section.

All questions carry **8 marks** except question three and eight which carry **6 marks** each.

3. (a) What do you understand by the following terms:
(i) Biology
(ii) Zoology.

(b) Why it is important to study Biology? Give four reasons.

4. (a) What do you understand by the term "First Aid"?

(b) State how you would render First Aid to a person who has been shocked by electric current.

5. (a) Define the terms "digestion" and "feeding" as used in Biology.

(b) Explain why during digestion the food is:
(i) Alkaline when in the mouth.
(ii) Acidic when in the stomach.
(iii) Alkaline when in the ileum.

6. (a) List any three characteristics of the Phylum arthropoda.

(b) (i) Mention the Classes of the Phylum Arthropoda.
(ii) Name one representative member for each Class you have mentioned in 6(b)(i).

7. The diagram in Figure 1 represents an eye of a human being. Study the diagram and answer the questions that follow:

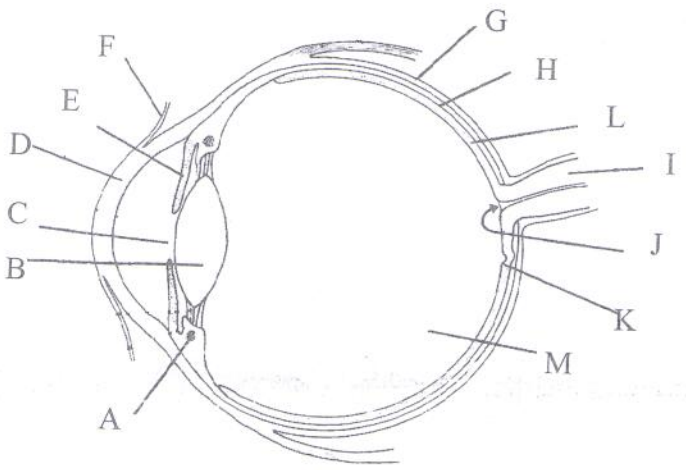


Figure 1

(a) Name the labelled parts A – L.

(b) What will happen in part C if someone suddenly face;
(i) the dim light.
(ii) bright light.

8. (a) Define the term "gene" and "genetics".

(b) Give two difference between Deoxyribonucleic acid (DNA) and Ribonucleic acid (RNA).

9. (a) Give the long meaning of the following abbreviation terms:
(i) HIV
(ii) STIs
(iii) TDs.

(b) Briefly explain any two ways through which HIV is transmitted from one person to another.

10. (a) Define the term "osmoregulation".

(b) Briefly explain the mechanisms of regulating sugar level in the blood.

SECTION C (20 Marks)

Answer **one (1)** question from this section.

11. Explain how the parts of the mammalian heart are adapted to their function.

12. Describe the symptoms of a person who is infected by Vibrio cholera and suggest six prevention measures and treatment for cholera outbreak.

13. Explain the functions of the major components of the human skeleton and their adaptations.

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/1

BIOLOGY 1
(For School Candidates Only)

Time: 3 Hours **Wednesday, 6th October 2010 a.m.**

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in sections A and B and **one (1)** question from section C.
3. Read each question carefully before you start answering it.
4. Except for diagrams that must be drawn in pencil all writings should be in blue/black ink or ball point pen.
5. Calculators are **not** allowed in the examination room.
6. Cellular phones are **not** allowed in the examination room.
7. Write your **Examination Number** on every page of your answer booklet(s).

This paper consists of 7 printed pages.

SECTION A (20 Marks)

Answer **all** questions in this section.

1. For each of the items (i) - (x) choose the correct answer from among the given alternatives and write its letter beside the item number.

(i) Which of the following is common to both plants and animals?
- A Respiration
- B Digestion
- C An excretory system
- D Chloroplasts
- E Starch grains.

(ii) A flower which possess both stamens and carpels is said to be
- A unisexual
- B hermaphrodite
- C monoecious
- D zygomorphic
- E polymorphic.

(iii) Useful substances are retained in the kidney by
- A filtration
- B osmosis
- C selective reabsorption
- D osmo-regulation
- E diffusion.

(iv) The Monera are also referred to as Prokaryotes. This means having
- A no nucleus
- B membrane bounded organelles
- C simple structures
- D reduced nucleus
- E circular nucleus.

(v) Which of the following is a characteristic of wind-pollinated flowers?
- A They have large brightly coloured petals.
- B They produce a small number of pollen grains.
- C They have small anthers situated inside the flower.
- D They do not have nectarines.
- E They have large, sticky or spiky pollen grains.

(vi) Food is moved along the oesophagus by a process known as:
- A assimilation
- B chewing
- C egestion
- D peristalsis
- E churning.

(vii) Reptiles differ from birds because
- A reptiles do not lay eggs while birds do
- B reptiles have a backbone while birds do not
- C reptiles have scales while birds do not
- D reptiles are cold blooded while birds are warm blooded
- E reptiles have moist skin while birds have dry skin.

(viii) Removal of predators in the ecosystem will result in
- A decrease in the number of producers
- B increase in the number of producers
- C decrease in the number of prey
- D an increase in the number of decomposers
- E no significant change

(ix) A bean plant can bear either terminal or axial flowers. When a terminal flowered plant (T) is pollinated with an axial flowered plant (t), the offspring produced were 200 terminal flowered and 210 axial flowered. Which of the following represents the genotypes of the parents?
- A TT x Tt
- B Tt x Tt
- C TT x tt
- D Tt x tt
- E T x t

(x) What does selective breeding mean?
- A Only pure stock should be inbreed
- B The parents are chosen to produce desired offspring
- C The encouragement of out breeding
- D The parents are chosen carefully
- E The offspring are like parents.

2. Match the responses in **List B** with the phrases in **List A** by writing the letter of the correct response beside the item number.

List A		List B	
(i)	Useful materials are returned to the blood stream from the glomerular filtrate	A	Diploid
(ii)	Gaseous exchange surface of insects	B	Lungbooks
(iii)	Exchange of materials between blood capillaries and cell	C	Liver
(iv)	Deamination of amino acid and formation of urea	D	Arthropoda
(v)	A substance secreted in bloodstream but brings its effect elsewhere	E	Seed dormancy
(vi)	Allows movement in three planes	F	Stem cutting
(vii)	The ability of seeds to germinate	G	Ultrafiltration
(viii)	Plant parts best for planting Irish potato	H	Ball and socket
(ix)	Chromosome occurring in unpaired set as in gametes	I	Diffusion
(x)	Body covered with a hard exoskeleton	J	Hormone
		K	Neurone
		L	Seed viability
		M	Osmosis
		N	Hinge
		O	Stem tuber
		P	Selective reabsorption
		Q	Tracheoles
		R	Haploid
		S	Mollusca
		T	Kidney

SECTION B (60 Marks)

Answer **all** questions in this section.

3. (a) For each of the following processes, state the site of the process, the raw materials, important products and by products.
   (i) Photosynthesis
   (ii) Aerobic respiration.

   (b) Give reasons why it is healthier to breath through the nose than through the mouth.

(6 marks)

4. (a) Explain what is meant by the following terms
   (i) heterotrophic nutrition
   (ii) autotrophic nutrition

   (b) The diagram below (Figure 1) shows the external structure of a leaf.

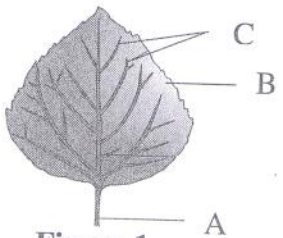


Figure 1

   (i) Name the parts labeled A, B, and C.
   (ii) What is the function of the part labeled C.
   (iii) What features of the external structure show that a leaf is adapted for photosynthesis.

(6 marks)

5. (a) Some insects are harmful and some are useful to man. Argue for this statement by giving three examples for each.

   (b) In what way are earthworms important to farmers?

(8 marks)

6. (a) (i) Define the term tropism
   (ii) State the biological importance of hydrotropism and phototropism.

   (b) How is accommodation brought about in the human eye?

(10 marks)

7. (a) Explain the functions of the following parts of a compound microscope.
   (i) Stage
   (ii) Eyepiece

   (b) Name four (4) human diseases caused by viruses.

(6 marks)

8. (a) Maduda on her way to school came across a rattle-snake on the path coming right towards her. In no time she found herself up a tree.

   (i) What gave her the ability to climb the tree so quickly?
   (ii) Identify the different processes that went on in her body during this incidence.

   (b) Stunted growth and severe mental retardation during early stages of development may be due to the under-secretion of a certain chemical substance.
   (i) Identify this chemical substance.
   (ii) What name is given to the condition described in (b)?

(6 marks)

9. (a) Define the following terms as used in Biology
   (i) Ecology
   (ii) Environment
   (iii) Community
   (iv) Ecosystem

   (b) (i) State the difference between natural and artificial ecosystems. Give one example in each case.
   (ii) Explain why food webs are more representative of feeding relationships than food chains.

(8 marks)

10. (a) Explain the following:
   (i) Acquired characters are not inherited.
   (ii) Ecological pyramids taper towards the apex.
   (iii) Walls of ventricles are thicker than those of auricles.
   (iv) Rate of heart beat increases when one is frightened.

   (b) Write down three (3) differences between mitosis and meiosis.

(10 marks)

SECTION C (20 Marks)

Answer **one (1)** question from this section.

11. Genetics is a branch of Biology dealing with heredity. How can this field of Biology be applied to everyday life?

12. The brain is the largest portion of the nervous system and very important for controlling activities in the body. With the aid of a diagram, describe the functions of the different parts of the human brain. Explain why only humans are said to be intelligent.

13. Write an essay on birth control methods which do the following:

    (a) Suppress the formation and /or release of gametes.

    (b) Prevent the union of gametes in fertilization.

    (c) Prevent implantation of fertilized egg.

TAHOSSA DAR ES SALAAM ZONE

ZONAL FORM IV MOCK EXAMINATION - 2013

BIOLOGY 1

033/1

Time: **3 HOURS** **Thursday 15th August 2013 A.M.**

INSTRUCTIONS

1. This paper consists of three **sections A, B** and **C**
2. Answer all questions in **section A** and **B** and **One (1)** question from **section C**.
3. Read each question carefully before you start answering it
4. Except for diagrams that must be drawn in pencil all writing must be in blue or black pen.
5. Electronic calculators and cellular phones are not allowed in examination room.
6. Write your examination number/name on every page of your answer booklet(s).

This Question Paper consists of 6 printed pages

SECTION A (20 MARKS)
Answer ALL questions in this Section

1. For each of the items (i) to (x), choose the correct answer from the given alternatives and write its letter beside the item number.

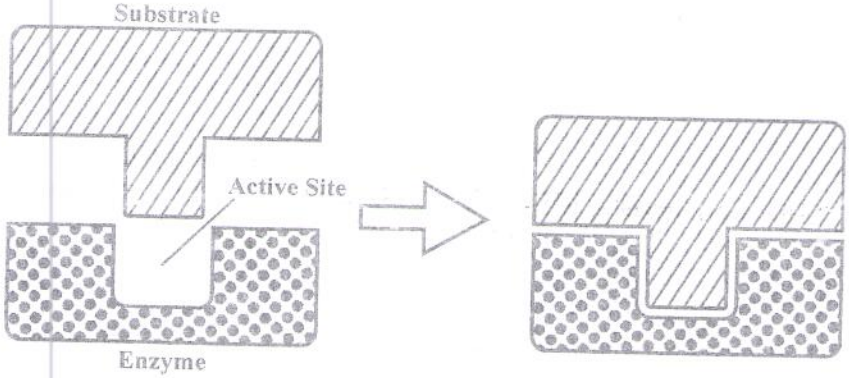
(i) One of the following is not a safe method of waste disposal.
A. Recovery
B. Recycling
C. Burning
D. Reduction
E. Re-use

(ii) Which of these diseases are inherited?
A. Malaria
B. Sickle cell anaemia
C. Influenza
C. German measles
E. Polio

(iii) Tonoplast is the membrane found in
A. Nucleus
B. Chloroplast
C. Mitochondria
D. Lysosome
E. Cell vacuole

(iv) What are the branches of taxonomy?
A. Nomenclature and ranking
B. Hierarchy and binomial
C. Nomenclature and systematics
D. Generic and specific
E. Order and class

(v) Study the diagram below and answer the question which follows

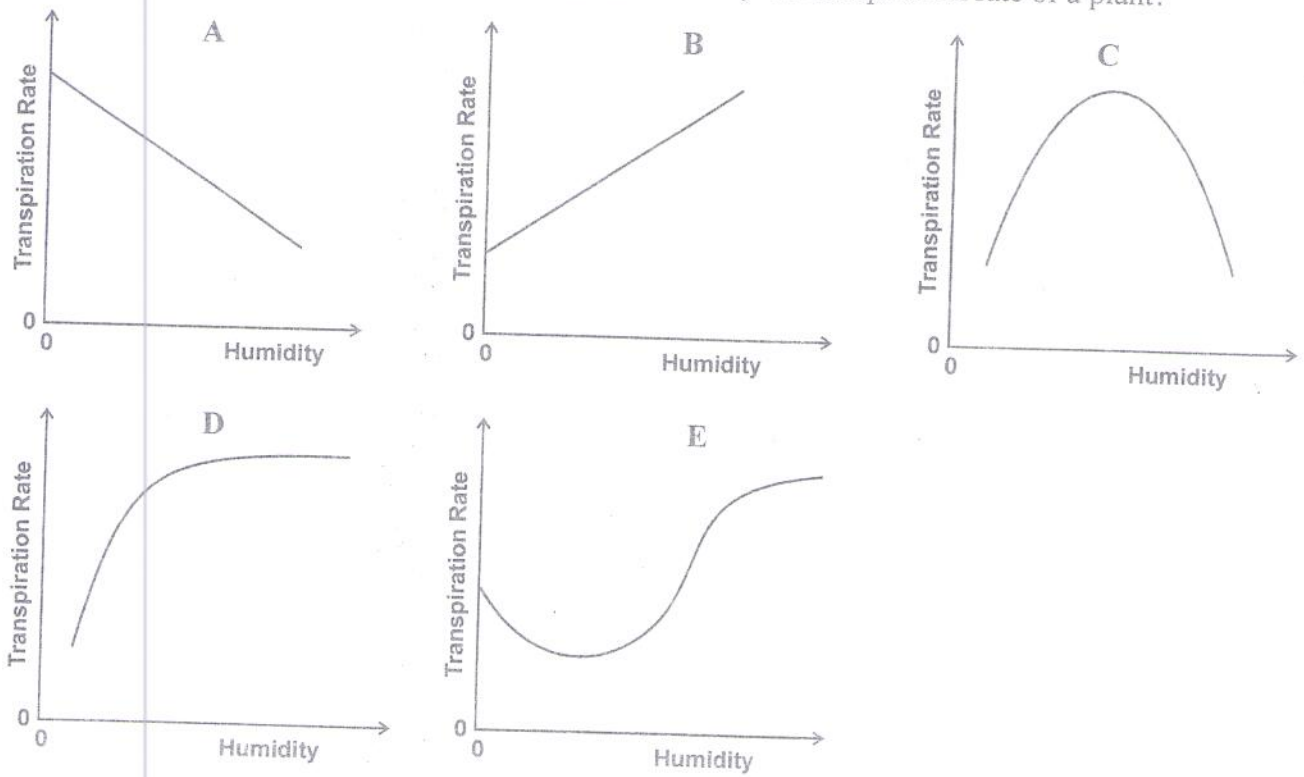


The diagram above represents the reaction between enzyme and food substrate. Which of the following statements is correct about the diagram?
A. Enzymes work best at optimum temperature.
B. Enzymes work as key and lock system.
C. Enzymes work best at optimum pH.
D. Enzymes are protein in nature.
E. Enzymes are inactive with coldness.

(vi) A group of individuals of the same species is called
A. Community
B. Niche
C. A biome
D. An ecosystem
E. A population

(vii) Which two bones form a ball and socket joint?
A. Humerus and ulna
B. Radius and scapula
C. Radius and ulna
D. Scapula and humerus
E. Skull and coccyx

(viii) Which graph shows the effect of increased humidity on transpiration rate of a plant?



(ix) Urea, a nitrogenous waste product excreted by the kidneys is formed in the

A. Kidneys
B. Stomach
C. Ileum
D. Liver
E. Lungs

(x) Organs having similar functions but different origin and development are

A. Vestigeal organs
B. Homologous organs
C. Analogous organs
D. Exoskeleton
E. Endoskeleton

2. Match the responses in List B with phrases in List A by writing the letter of the correct response from List B beside the item number of List A in your answer booklet.
Each choice in column B may be used once, more than once or not at all.

LIST A

i. Uses light to illuminate the specimen
ii. Concentrates light reflected from the mirror
iii. Provides firm and steady support to the microscope
iv. A flat platform where a specimen on a slide is placed
v. Supports the body tube and stage
vi. Holds eyepiece and revolving nosepiece
vii. It raises and lowers the stage
viii. Brings image into focus and magnifies it
ix. Holds the slide or the specimen into position
x. It raises and lowers the tube at small distances to obtain a fine focus

LIST B

A. Body tube
B. Clip
C. Hinge screw
D. Electron microscope
E. Stage
F. Condenser
G. Objective lens
H. Revolving nosepiece
I. Coarse adjustment
J. Light microscope
K. Fine adjustment knob
L. Base
M. Arm
N. Mirror
O. Diaphragm

SECTION B (60 Marks)

Answer ALL questions in this Section

3. a. Define First Aid Kit.

   b. How can one administer First Aid to the victims of
      i. Excessive bleeding from body cut
      ii. Poisoning from swallowing

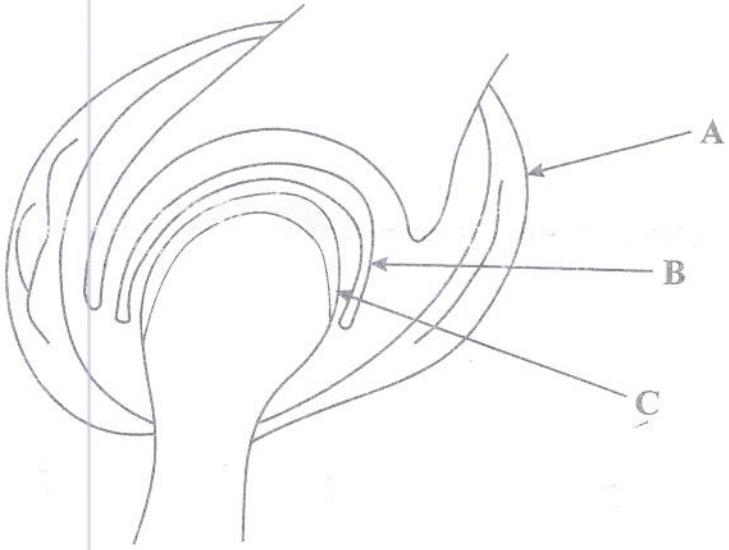
4. a. i. Name any four factors required for the formation of carbohydrates in plants.
      ii. Why is water an essential part of our diet? (Outline any four).

   b. i. With an example in each case differentiate between hazardous and non-hazardous waste.
      ii. Mention three proper ways of disposing waste.

5. In a fresh water pond the feeding relationships between the organisms are as described below. At different times in their life cycle, tadpoles are herbivores or they might eat mosquito larvae which feed on algae. Fish eat everything found in the water and ducks feed on everything found in the pond.

   a. i. Prepare a food web to show the feeding relationship
      ii. What is the source of energy of all the organisms?
      iii. Which organisms make direct use of this energy?
      iv. Which organism listed has the greatest biomass?

   b. The diagram below is the part of a human skeleton. Study the diagram and answer the questions which follow.



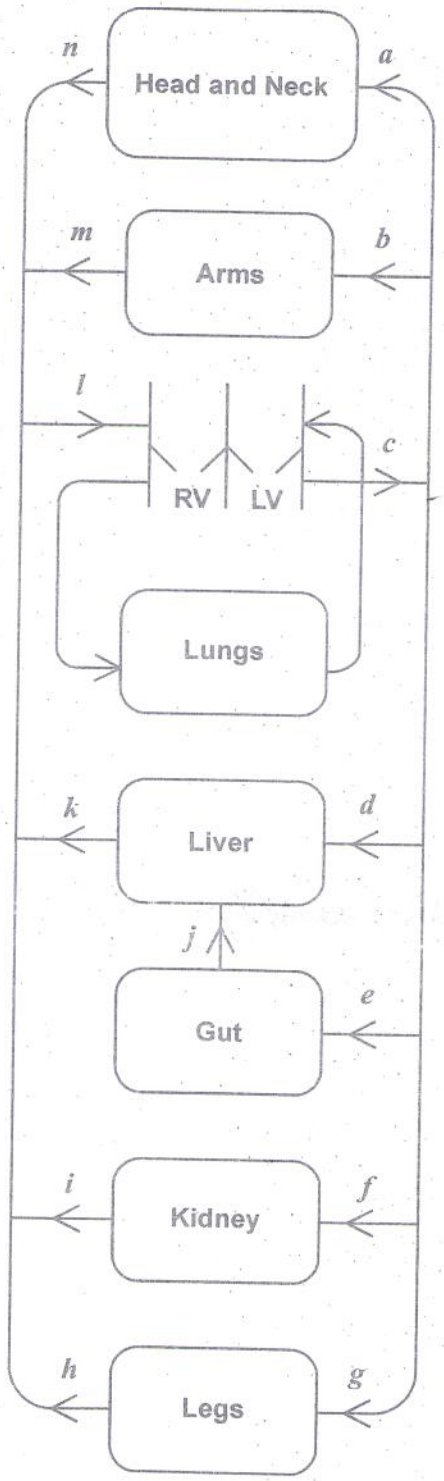
      i. Name the parts A, B and C

      ii. Which part of the skeleton does the above diagram represent?

      iii. Give the function of structure labelled A.

6. a. Mention two places in plants and two places in animals where mass flow type of transportation takes place.

b. Carefully study the diagram below showing blood vessels distribution in the human body and then answer the questions that follow



i. Label blood vessels *a, b, c, d, e, f, g, h, i, j, k, l, m* and *n*.

ii. Briefly explain the significance of blood-vessel *j* to connect the gut and the liver so that food moves to the liver first before it joins the general blood system flowing towards the heart.

7. a. Define the following terminologies
   i. Tropic movement
   ii. Nastic movement
   iii. Tactic movement

   b. i. What are the effects of high concentrations of auxin on a shoot and root?
   ii. Explain fully how these reactions fit the plant towards its way of life.

8. a. Mention materials exchanged in the placenta.
   i. From mother to foetus
   ii. From foetus to the mother

   b. i. Differentiate between epigeal and hypogeal germination
   ii. Briefly explain three factors affecting germination in a seed.

9. a. Define the following terms
   i. Co-dominance
   ii. Incomplete dominance

   b. When a smooth seeded plant was crossed to a wrinkled seeded plant, all the F_1 plants were smooth seeded. However in the F_2 generation out of 580 plants produced 152 were wrinkled seeded plants.
   i. Using letters to represent the genes write out a plan showing the segregation of genes from the first parents to the F_2 plants.
   ii. In the F_2 plants how many were
   - Recessive
   - Heterozygous dominant
   - Homozygous dominant

10. a. After playing football in the sun, a person may feel warm but his skin is cool. Explain.
   b. i. What is a fossil?
   ii. Describe briefly how fossils provide evidence for evolution. (Diagrams are not necessary)

SECTION C (20 Marks)
Answer one (1) question in the section

11. Citing examples in each case outline the ways in which insects are both beneficial and harmful to humans.

12. a. Mention two
   i. Non-communicable reproductive tract infections
   ii. Communicable reproductive tract diseases

   b. Outline the ways by which the human body prevents invasion and infection by disease causing micro-organisms

13. Write an essay on environment under the following guidelines
   i. Meaning of environment
   ii. Good environmental conservation practices
   iii. Human activities which lead to environmental degradation
   iv. Effects of environmental degradation