

FEDERAL REPUBLIC OF SOMALIA

GRADE 12 EXAMS, 2024

BIOLOGY



OFFICE OF EXAMINATIONS AND CERTIFICATION



Ministry of Education, Culture & Higher Education

National Examinations and Certifications Office

Form Four National Examinations.

June, 2024

SUBJECT: BIOLOGY

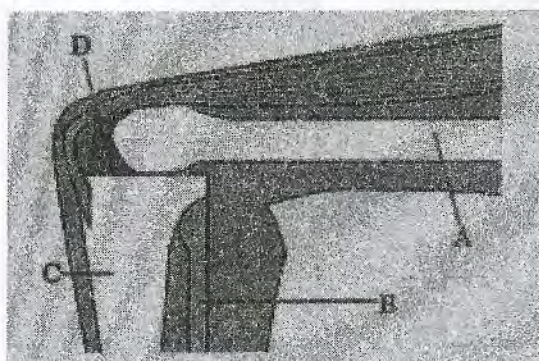
TIME: 2 HOURS

INSTRUCTIONS: Answer all questions in the ANSWER BOOKLET

SECTION A: MULTIPLE CHOICE: CIRCLE THE LETTER OF THE CORRECT ANSWER
[20 MARKS]

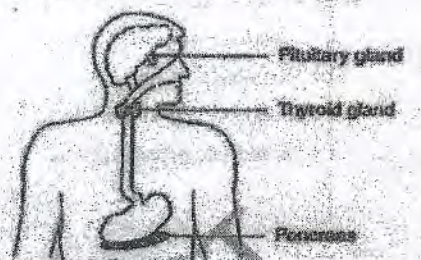
- Which of the following parts of the brain controls the body temperature?
a) Thalamus b) Cerebellum c) Pons d) Hypothalamus
- Which of the following is a mismatched pair?
a) Adrenaline: pituitary gland b) Estrogen: ovary
c) Pancreas: insulin d) Progesterone: ovary
- The variability among living organisms, their habitats and their genes, and the ecological complexes of which they are part is known as:
a) Biotechnology b) Biodiversity c) Bio-ecology d) Bioethics
- For what purpose is DNA finger printing used?
a) To identify single nucleotides b) to sequence DNA from bacteria
c) to separate DNA fragments d) to identify individuals committed in crimes
- One of the following is an INCORRECT statement about insulin. This is:
a) It is produced in pancreas of the human body
b) It regulates growth and development of the body
c) It regulates blood glucose level in the blood
d) Its deficiency in the body will cause diabetes
- Electrical impulse travels in a neuron from:
a) Dendrite → axon → axon end → cell body
b) Cell body → dendrite → axon → axon end
c) Dendrite → cell body → axon → axon end
d) Axon end → axon → cell body → dendrite
- The complete set of an organism's DNA including all its genes is called:
a) Gene b) Genome c) Genetic code d) Genotype

8. A pregnant woman has an equal chance of her Baby being blood group A or blood group AB. Which one of the following shows the possible genotypes of the woman and the father of her child?
- a) $I^A I^A$ and $I^B I^i$ b) $I^A I^B$ and $I^B I^i$ c) $I^A I^i$ and $I^B I^i$ d) $I^A I^A$ and $I^A I^i$
9. Exoskeletons and endoskeletons differ in that
- a) an exoskeleton is rigid, and an endoskeleton is flexible.
 b) endoskeletons are found only in vertebrates.
 c) exoskeletons are composed of calcium, and endoskeletons are built from chitin.
 d) exoskeletons are external to the soft tissues, and endoskeletons are internal.
10. The diagram below represents bones at a joint found in the hind limb of a mammal. Name the substance found in the place labelled D.



- a) Hypertonic fluid b) Synovial fluid c) Joint fluid d) Friction fluid
11. The neurons that receive information from brains and convey command to the effector organs is called
- a) Sensory neurons b) Neuroglia c) Motor neurons d) Effector
12. The direct manipulation of an organism's genes using biotechnology is
- a) Genetic engineering b) Genetic application
 c) Genetic technology d) DNA technology
13. Which Hormones are responsible for the "Fight-or-Flight" Response?
- a) Thyroxine and melatonin b) Insulin and glucagon
 c) Epinephrine and norepinephrine d) Estrogen and progesterone
14. The Labelled organs in the figure below are parts of which body system:

- a) Endocrine
 b) Circulatory
 c) Digestive
 d) Integumentary

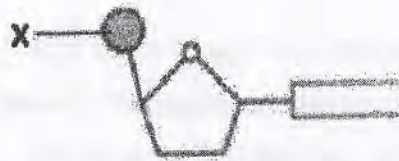


15. What is the main component of the bone and teeth?
- a) Calcium phosphate b) Calcium carbonate c) Calcium hydroxide d) Calcium sulfate



16. What is the risk of a color-Blind child in a family when father is color blind and the mother is normal?
 a) 50% b) 25% c) 100% d) 0%
17. Occurs when members of a pair of homologous chromosomes fail to separate:
 a) Polyploidy Aneuploidy Non-disjunction Monosomy
18. Which hormone is responsible for the stimulating of milk production in the mammary glands?
 a) Prolactin b) Oxytocin c) Estrogen d) Progesterone
19. The diagram below shows a structure of DNA nucleotide. The structure labelled X is:

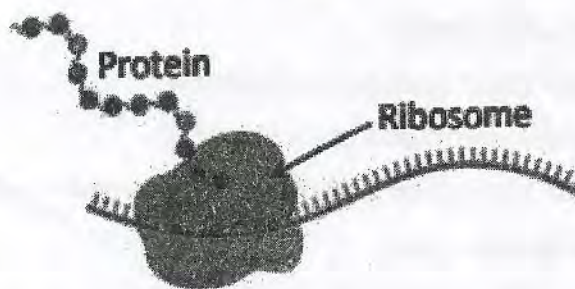
- a) Nitrogen base
 b) Carbon sugar
 c) Phosphate group
 d) Hydrogen bond



20. All of the following are functions of skin EXCEPT
 a) Formation of vitamin D b) Regulation of body temperature
 c) Protection from micro-organisms d) Detoxification of the body

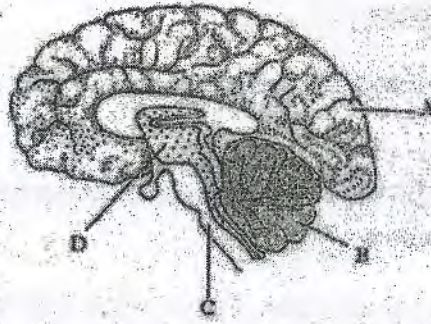
SECTION B: STRUCTURED QUESTIONS (60 MARKS)

1. Protein synthesis occurs on ribosomes, as shown in the diagram. Ribosomes are composed of RNA subunits.
 a) Name the other two types of RNA involved in protein synthesis (2 marks).
 b) State the function of each type (4 marks)



2. A person whose blood group is AB requires blood transfusion. Name the blood groups of the donors? (4 marks)
3. What is an Autonomic Nervous System? Name the two main parts of central nervous system (6 marks).
4. State three differences between DNA and RNA (9 marks)
5. If sugar is detected in the urine of a person, what kind of disease is this person suffering from (4 marks).

6. The diagram Below shows a human brain.



- a) Which part maintains posture and balance of the body? (1 marks)
 - b) Which part of the brain controls breathing rate (1 marks)
 - c) What is the function of the part labelled A? (4 marks)
7. When a color-blind man marries with a carrier woman, what will be the percentage of
- a) color-blind sons (3 marks)
 - b) color-blind daughter (3 marks)
8. The diagram shows an example of a nervous response:



- a) Name this type of response (2 marks)
 - b) Which organ is responsible for this response (2 marks)
 - c) State one function the organ mentioned in (b) (2 marks).
9. If the gene for insulin production is transferred from a human pancreatic cell to a certain bacterium, it produces human insulin within the bacterium:
- a) Give the name of the process of transfer of the gene (2 marks)
 - b) State one advantage of the process mentioned in (a) (3 marks)
10. Skin is the Largest organ in human body:
- a) Identify the TWO types of glands found in the skin (2 marks)
 - b) Describe the function of each gland (6 marks).

SECTION C: COMPLETION QUESTIONS (10 MARKS)

Genetic diversity, species diversity, and ecosystem diversity, splicing, Heredity, dermis and epidermis, endocrine glands, 206, cerebrum, , mRNA, tRNA, and rRNA, gene therapy, biosphere

1. The process of correcting mutated gene that causes human disease is called _____.
2. The two main layers of the skin are _____ and _____.
3. _____ is the largest and most complex part of the human Brain and constitutes about 90% of the brain's volume.
4. The total number of bones in adult of human being is _____ bones.
5. _____ is the removing of introns and rejoining of axons
6. The three types of biodiversity are _____, _____ and _____.
7. The three main types of RNA are (i) _____, (ii) _____ and (iii) _____.
8. The region of the earth where life exists is called _____.
9. Ductless glands are also known as _____.
10. _____ is the process by which genetic information is passed from parents to offspring.

SECTION D: MATCH THE TERMS IN COLUMN A WITH SUITABLE DESCRIPTION WITH COLUMNS (10 MARKS)

COLUMN A	CLOUMN B
1. Peripheral nervous system	[] it is located on the top of each kidney
2. Parasympathetic	[] all materials an organism found in biosphere
3. Dermis	[] the study of heredity and variation
4. Genetics	[] comprises neutrons that carry information to and from the central nervous system
5. Pituitary gland	[] the loss of an entire organism from the biosphere
6. Natural resource	[] an exact copy of a DNA segment, a whole cell or a complete organism
7. Hybridization	[] mostly active when the body is resting (relaxed)
8. Adrenal gland	[] the production of hybrid
9. Extinction	[] the inner layer of the skin
10. Clone	[] also known as the master gland