

Ministry of Education, Culture & Higher Education
National Examinations and Certifications Office
Form Four National Examinations

June 2024

SUBJECT :- BIOLOGY

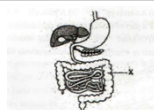
TIME :- 2 HOURS

INSTRUCTIONS :- Answer all questions in the ANSWER BOOKLET

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

1. The diagram below represents a portion of the human body. The principal function of structure X is to

- | | | | |
|--------------------|--------------------|-----------------|--------------------|
| (A) Absorb water | B. Secrete insulin | C. Produce bile | D. Secrete amylase |
|--------------------|--------------------|-----------------|--------------------|



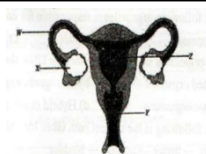
2. Iodine is necessary for the synthesis of which of the following hormones ?

- | | | | |
|---------------|----------|-----------------|------------|
| A. Adrenaline | B. Auxin | (C) Thyroxine | D. Insulin |
|---------------|----------|-----------------|------------|

3. Which of the following is the correct sequence in the circulation of blood ?

- | |
|---|
| A. Heart → arteries → arterioles → capillaries → venules → lymph → heart |
| B. Heart → arteries → arterioles → capillaries → veins → venules → heart |
| (C) Heart → arteries → arterioles → capillaries → venules → veins → heart |
| D. Heart → arterioles → arteries → capillaries → venules → veins → heart |

A diagram of the human female reproductive system is shown. Where does implantation Normally occur?



- | | | | |
|------|------|---------|------|
| A. W | B. X | (C) Y | C. Z |
|------|------|---------|------|

5. The smallest unit of classification in taxonomic units is

- | | | | |
|----------|---------------|-----------|----------|
| A. Genus | (B) Species | C. Family | D. Order |
|----------|---------------|-----------|----------|

6. The process by which green plants make their own food from carbon dioxide and water by using sunlight energy in the presence of chlorophyll, is called :-

- | | | | |
|----------------------|----------------|---------------|--------------|
| (A) Photosynthesis | B. Respiration | C. Photolysis | D. Excretion |
|----------------------|----------------|---------------|--------------|

7. The figure below shows a section through a pea flower. Which part attracts animals for pollination to take place?



- | | | | |
|------|---------|------|------|
| A. F | (B) J | C. G | D. L |
|------|---------|------|------|

8. Which hormone is produced when blood sugar level decreases ?			
A. Insulin	B. Thyroxine	(C) Glucagon	D. Adrenaline
9. Fertilization results immediately in the formation of :-			
(A) A Zygote	B. An embryo	C. A placenta	D. A fetus
10. Which one of the following is NOT a part of the human male reproductive system ?			
A. Testis	(B) Oviduct	C. Seminal vesicle	D. Prostate gland
11. The diagram below shows a plant cell in which part does photosynthesis takes place?			



A. 1	B. 2	(C) 3	D. 4
12. Which of the following is responsible for the green color of plants ?			
(A) Chlorophyll	B. Melanin	C. Basophil	D. Leucoplasts
13. The process of digestion of food in humans is completed in :-			
A. Stomach	B. Food pipe	C. Mouth	(D) Small intestine
14. Females possess softer skin than males due to the presence of a hormone that causes the softness and smoothness of skin. This hormone is :-			
A. Testosterone	B. Prolactin	C. Progesterone	(D) Estrogen
15. Which of the following organelles is responsible for energy production of the cell ?			
A. Ribosomes	B. Lysosomes	(C) Mitochondria	D. Golgi body
16. _____ Are organisms which contain foreign DNA that has been introduced using biotechnology :-			
A. Mutated organism		(B) Transgenic organisms	
C. Genetic organisms		D. Hybrid organisms	
17. Which of the following is the correct path taken by urine in our body ?			
A. kidney → ureter → urethra → bladder			
B. kidney → bladder → urethra → ureter			
C. bladder → kidney → ureter → urethra			
(D) kidney → ureter → bladder → urethra			
18. The faulty functioning of an endocrine gland can make a person very short or very tall. This gland is :-			
A. Thyroid	B. Pineal	C. Adrenal	(D) Pituitary
19. Select the group which shares the maximum number of common characters :-			
(A) Two individuals of a species		B. Two species of a genus	
C. Two genera of a family		D. Two genera of two families	
20. If a black cow (Bb) were crossed with a white cow (bb) what would be the phenotypic ratios of the offspring			
A. 3:1 black to white	B. 0:4 black to white	C. 1:2 black to white	(D) 1:1 black to White

SECTION B :- COMPLETION QUESTIONS [10 MARKS]

Gigantism, gonads, blood and blood vessels, oxygen, herbivores, plasma, simple and conditioned, 126, cell, ecology

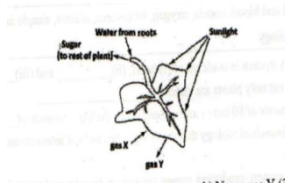
1. The human circulatory system is made up of (i) heart (ii) Blood And Blood Vessels
2. Those animals which eat only plants are called Herbivores
3. The axial skeleton consists of 80 bones and appendicular skeleton consists of 126 Bones
4. Ecology is the branch of biology that deals with the study of interactions among organisms and their environment.
5. Gonads are gamete-producing organs (ovaries in females and testes in males)
6. The liquid part (or fluid part) of blood is called Plasma
7. Cell is the basic structural and functional unit of living organisms.
8. The two types of reflex actions are Simple And Conditioned
9. The mass of the human brain is about 1.4kg and it uses 20% of the that reaches the body Oxygen
10. In children who are still growing, too much growth hormone can cause a condition called Gigantism

SECTION C :- MATCH THE TERMS IN COLUMN A WITH SUITABLE DESCRIPTION WITH COLUMNS [10 MARKS]

No	Column A	No	Column B
1	CNS	5	Acts as both endocrine and exocrine gland
2	Spermatophyta	9	Blood vessels that carry blood away from heart
3	Organ	8	An inflammation of the Joints
4	Ligase	10	One of the common skin disorders
5	Pancreas	3	A group of tissues working together
6	Pollution	4	Enzyme that joins the adjacent strands of DNA Fragments
7	Botany	1	The brain and the spinal cord
8	Arthritis	7	The scientific study of plants
9	Arties	6	Atmospheric change that threatens biodiversity
10	Eczema	2	Seed producing plants

SECTION D :- STRUCTURED QUESTIONS [60 MARKS]

1. The diagram below shows a plant during photosynthesis.



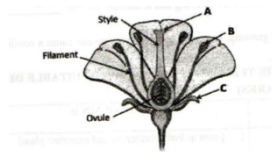
A. Name gas X

B. Name gas Y

2. What is the difference between the axial and appendicular skeletons ?

3. Complete the diagram below which shows a partly filled section of a DNA molecule

4. The diagram shows a typical animal-pollinated flower



A. Name the structures A, B and C

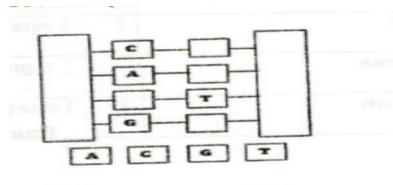
B. Give one function for each structure A and B

C. What does the ovule develop into if fertilization occurs ?

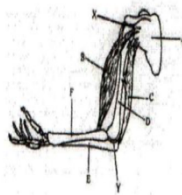
5. If the sequence of ATCGGCAT is a part of DNA:

A. What is the complementary DNA strand ?

B. What is the complementary RNA strand ?



6. The diagram below shows the bones and t o of the muscles in the human arm.



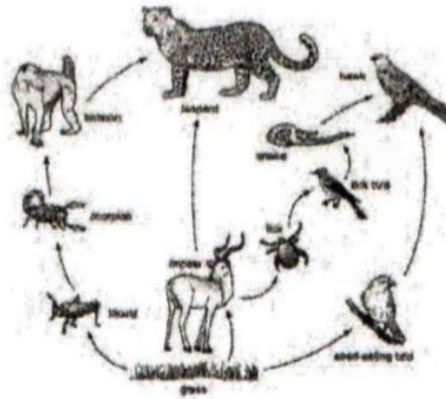
A. Name the parts labelled A, B and C

B. Name the types of Joints present in the parts labeled X and Y

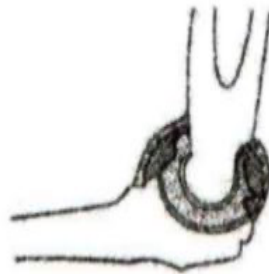
C. What will happen to the Muscle C when the muscle B contracts ?

7. The figure below shows a food web. Name an organism from this food web that is a

- A. A producer B. Primary consumer C. Secondary consumer



8. The Figure below is a diagram of the elbow joint :



- A. Name the type of joint illustrated in Figure
 - B. People who suffer from arthritis experience pain because certain parts of the joint are worn away. Identify the TWO most common types of arthritis
9. Answer each of the following questions :
- A. What are the names of the male sex hormone, and the female sex hormones
 - B. What name is given to the fusion of sperm and ovum ?
 - C. What is the name of the tissue through which the fetus gets all the requirements from the mother's body ?
10. Albinism is a recessive trait in humans. Two normal parents have an albino child. What is the probability that their next child will be ?
- A. Normal
 - B. Albino

Answers

1. A. Gas X :- Carbon Dioxide (CO₂) B. Gas Y :- Oxygen (O₂)

2. Axial skeleton is the part (division) of the skeletal system that consists of the skull, the vertebral column the ribs and the sternum

Appendicular skeleton is the part (division) of the skeletal system that consists of the bones of the shoulders, arms, hands, hips, legs and feet

Axial skeleton :- 80 bones (skull, vertebral column, rib cage).

Appendicular skeleton :- 126 bones (limbs, shoulder girdle, pelvic girdle)

3. Diagram completion requires labeling phosphate-sugar backbone and nitrogenous bases (adenine, thymine, cytosine, guanine).

4. A. A :- Stigma B :- Anther C :- Ovary

B. Function of A (Stigma): Receives pollen. Function of B (Anther): Produces pollen.

C. The ovule develops into a seed if fertilization occurs

5. A. Complementary DNA strand :- TAGCCGTA

B. Complementary RNA strand :- UAGCCGUA

6. A :- Humerus B :- Biceps C :- Triceps

B. X :- Hinge joint Y :- Ball-and-socket joint

C. Muscle C will relax.

7. A. Producer :- Grass

B. Primary consumer :- Antelope

C. Secondary consumer :- Leopard

8. A. Hinge joint

B. Osteoarthritis and rheumatoid arthritis

9. A. Male :- Testosterone Female :- Estrogen and Progesterone

B. Fertilization

C. Placenta

10.

A	a
AA	Aa
Aa	aa

A. The Probability Normal Is $\frac{3}{4} \times 100 = 75\%$

B. The Probability Albino is $\frac{1}{4} \times 100 = 25\%$

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