NAME.....INDEX NO.....

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P530/1 SET 2

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P530/1 SET 2
BIOLOGY
PAPER 1
JULY 2022
2 ½ HOURS

UGANDA ADVANCED CERTIFICATE OF EDUCATION
MOCK EXAMINATIONS 2022
BIOLOGY
PAPER 1
2 ½ HOURS

INSTRUCTIONS TO CANDIDATES

The paper consists of two sections **A** *and* **B**.

Answer **all** *questions in both sections*

SECTION A: *consists of* ***40*** *questions. Write answers to this section in the boxes provided.*

SECTION B: *consists of 6 questions. Write answers to this section in the spaces provided.*

No additional sheets of paper should be inserted in this booklet

For Examiner's use only

SECTION A 1-40	MARKS
41	
42	
43	
44	
45	
46	
TOTAL	

SECTION A (40 MARKS)

1. Which of the following is **not** a nitrogenous compound?
   A. Amylum
   B. A gene
   C. DNA
   D. RNA

2. When DNA replicates it is thought to unwind and unzip along the
   A. bonds between the deoxyribose and phiosphate only
   B. bonds between a phosphate group and nitrogenous bases
   C. phosphate to phosphate bonds
   D. hydrogen bonds between the base pairs

3. "Jimpy"is a trait in mice characterized by muscular incoordination which results in death at an age of 3 to4 weeks. Crosses between heterozygous females and normal males produce litters in which half the males are"Jimpy" From this information what type of genes causes"Jimpy"
   A. Sex linked, dominant and lethal
   B. Lethal, sex linked and recessive
   C. Sex linked, non-lethal and dominant
   D. Sex linked, non lethal and recessive

4. Enzymes are specific because of
   A. their high molecular weight
   B. the presence of co-enzymes
   C. their surface configuration
   D. their hydrogen bonding

5. The following reactions would be catalysed in the cell by enzymes known as

$RCH\,NH_2\,COOH + O_2 \rightleftharpoons RCOCO\,OH + NH_3$

A. oxidase

B. dehydrogenase

C. carboxylase

D. esterase

6. Secondary protein structure is held together by

A. ionic bonds

B. hydrogen bonds

C. covalent bonds

D. sulphur bridges

7. The chemical of life which contributes the largest component of the dry mass of an organism is

A. water

B. protein

C. lipid

D. carbohydrate

8. Which of the following would not lead to the alteration of gene frequencies according to the Hardy- Weinberg Equilibrium?

A. Chance .

B. Gene migration

C. Random mating

D. Mutation

9. Which of the following is **not** an evidence of natural selection in action?

A. Industrial melanism

B. Sickle cell trait

C. Resistance to antibiotics

14. An octopus eye is very similar to the human eye in appearance but the two eyes differ in structure. They are therefore described as being

A. homologous

B. analogy

C. vestigial

D. heterogeneous

15. The most important aspect of interrelationship between individuals of different species in an ecosystem is based on

A. shelter

B. nutrition

C. adaptation

D. Decomposition

16. The table 1 below given the cross over values (COV) of three linked genes **A,B** and **C**

Linked gene pair	**COV**
A B	11
A C	7
B C	18

Which of these statements is true about the arrangement of these genes on the chromosome?

A. Gene A is between genes B and C but near gene C than gene B

B. Gene A is between genes B and C but nearer gene B than gene C

C. Gene B is between genes A and C

D. Gene A, B and C are arranged on the chromosome in any order

17. A DNA molecule has 1000 bases of which 200 are guanine .The percentage of Thiamine in the DNA is

A. 40

B. 20

C. 30

D. 60

18. Which of the following is least likely to bring about speciation?

A. Environmental stability

B. Gene mutation

C. Geographical isolation

D. Chromosome changes

19. According to modern biologists Darwin's struggle for existence means

A. organisms fight to live and the strongest survive

B. there is competition for survival in which only the physically fittest succeed.

C. There is competition for survival in which only the reproductively fit survive.

D. The longer and stronger organisms usually live longer.

20. The carbohydrates synthesized in plant leaves are transported through sieve tubes mainly in the form of

A. glucose

B. sucrose

C. triose sugar

D. soluble starch

21. If haemoglobin was replaced by haemocyanin in mammals the blood would carry

A. less oxygen

B. more oxygen

C. no oxygen

D. same amount of oxygen

22. Carbon monoxide is more harmful than carbondioxide because it

A. has more affinity for haemoglobin

B. reacts quickly with ultra violet rays

C. has less affinity for haemoglobin

D. cannot compete with oxygen

23. Which of the following harmful substances are changed into less harmful ones through the Ornithine cycle?

A. Urea and Uric Acid

B. Urea and ammonia

C. Ammonia and carbondioxide

D. Ammonia and uric acid

24. Uriniferous tubules are mainly concerned with

A. concentration of urine

B. passage of urine

C. reabsorption of useful substances in glomerular filtrate

D. removal of urea from blood

25. Which of the following is the most toxic nitrogenous waste?

A. Uric acid

B. Ammonia

C. Urea

D. Trimetylamine oxide

26. The major portion of dry weight of plants comprises of

A. calcium, magnesium and sulphur

B. Carbon, nitrogen and hydrogen

C. Carbon, hydrogen and oxygen

D. Nitrogen, phosphorous and potassium

27. During prolonged fasting in what sequence are the following organic compounds used up by the body

A. fats then carbohydrates then proteins

B. Carbohydrates then proteins then lipids

C. Proteins then lipids then carbohydrates

D. Carbohydrates then lipids then proteins

28. Transpiration pull is expected to be at its maximum under which of the following conditions?

A. Open stomata, high humid atmosphere and well irrigated soil

B. Open stomata, dry atmosphere and moist soil

C. Open stomata, high humid atmosphere and dry soil

D. Closed stomata, low light intensity and humid atmosphere

29. Increase in carbon dioxide concentration around a leaf results in

A. partial closure of stomata

B. Complete closure of stomata

C. Opening of stomata

D. No effect on stomatal opening and closing

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39. Which of the following is a neurotransmitter that stimulates contraction of skeletal muscle?

A. Noradrenaline
B. Adrenalin
C. Acetylcholine
D. Calcium

40. A sperm cell follows which of the following path during ejaculation

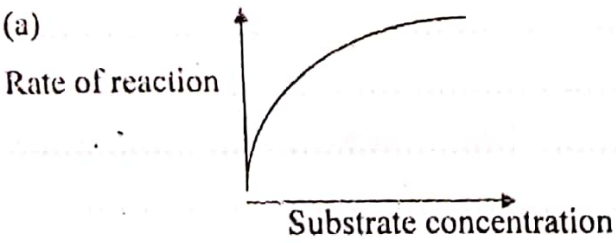
A. Seminiferous tubule-epididymis-vas deferens- urethra
B. Urethra-vas deferens-seminiferous tubule-epididymis
C. Seminiferous tubule-vas deferens-epididymis-urethra
D. Epididymis-seminiferous tubule-vasdeferens-urethra

SECTION B (60 marks)

41. Figures 1 (a) and (b) are related to a reaction in which enzyme **X** catalyses the hydrolysis of substrate **Y**

Temperature was kept constant at 30°C and PH at 7 during both investigations. In the (a) investigation enzyme concentration was kept consist and in (b) substrate concentration remained constant.

(a)



b)

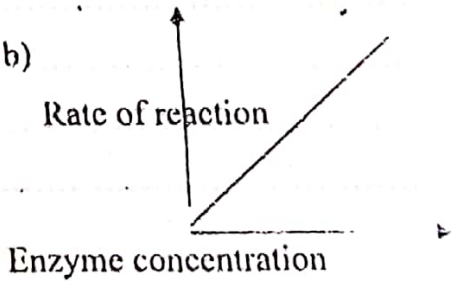


Figure 1

a)Explain the difference between both graphs (04 marks)

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b) If temperature and PH remain constant, suggest **one** reason why the rate of reaction shown in graph (b) might decrease rapidly (01 mark)

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c) What is a limiting factor. (01 mark)

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d) Give **two** examples of limiting factors to enzyme activity explaining how they bring about an effect.. (04 marks)

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42.(a)(i)What is meant by the term allele frequency? (02 marks)

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(ii) Suggest **three** causes of change in allele frequency in a population (03 marks)

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(b) State the **Hardy Weinberg principle** (03 marks)

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(c)A gene in humans controls the ability to taste the chemical **phenylthiocarbamide (PTC).** The ability to taste is endowed by the presence of the dominant allele **T**, so that people with genotypes **TT** and **Tt** are tasters, individuals with genotypes **tt** are non-tasters. In a group of people, **195**individuals were able to taste PTC and **105** could not taste it. Assuming that the Hardy-Weinberg principle applies in this case, calculate the frequency of individuals with genotype **Tt**. Show your working (04 marks)

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43. Figure 2 shows the heads of four of the 10 species of Darwin's finches inhabiting one organic volcanic islands in the Galapagos archipelago.

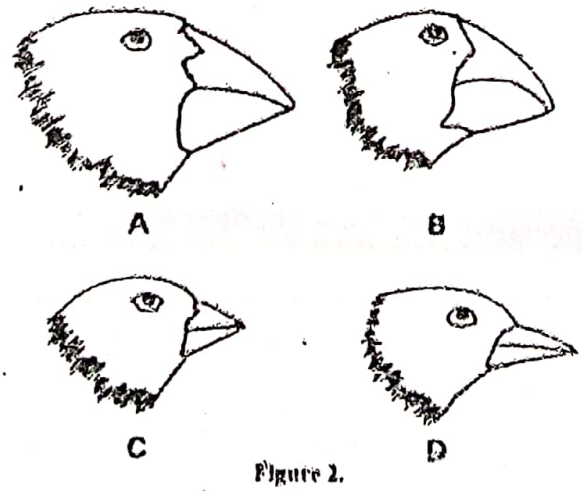

Figure 2.

a) Name the process that resulted into the evolution of the different forms of beaks (01mark)

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b) Explain the advantage of the differences in the four species shown (03 marks)

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c) Explain how the difference in the four species provides evidence for evolution (03marks)

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There are far more species of finches than other birds on the island .Suggest an explanation for this observation (03 marks)

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44.a) Name **two** types of animals that produce **cleidoic** eggs(02 marks)

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b) Describe the main features of **a cleidoic** egg that has made it so successful (02 marks)

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c) Explain how a **cleidoic** egg provides for the following needs of a developing embryo (04 marks)

(i) Elimination of wastes

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(ii) Gas exchange

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(iii) Nutrition (food supply)

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d) Name an animal group with

(i) Internal fertilization but external development (01 mark)

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(ii) Internal fertilization and internal development (01 mark)

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45.a) Describe the sliding filament model of muscle contraction (03 marks)

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b) Explain how the ratchet mechanism enables filaments to slide past each other.(04 marks)

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c) In the space below draw and label a relaxed skeletal muscle filament with one sarcomere (03 marks)

46 . Figure 4 shows the results of an investigation on the net carbon dioxide absorption at different light intensities of two plants growing in different habitats

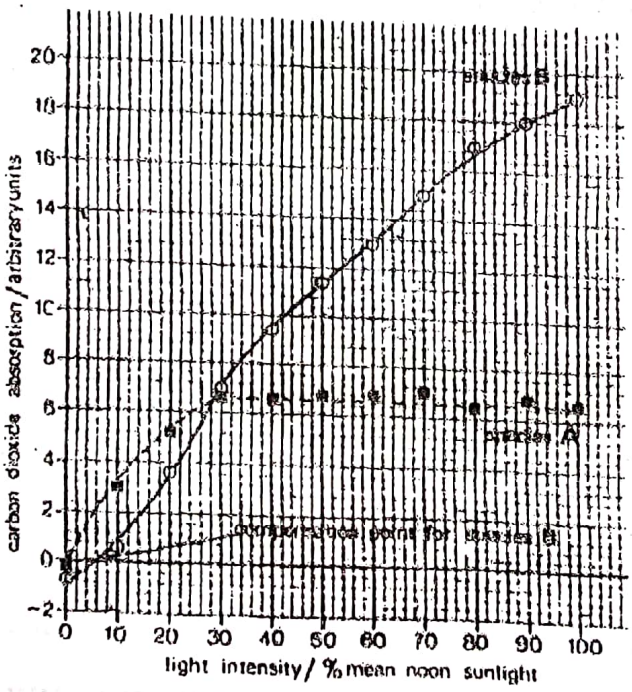

Figure 4

a) Compare the effect of light intensity on carbon dioxide absorption (04 marks)

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b) Giving a reason, state which species is adapted to (03 marks)

(i) Shade

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(ii)Light

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c) Indicate on the graph the compensation point for species **A** (01 mark)

d) Explain the carbon dioxide absorption of species B between 30 and 100% mean noon sunlight (02 marks)

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END