**NAME…………………………………………………………………. COMBN………**

**SIGNATURE: …………………………………………………….**

**P530/1**

**Biology**

**Paper1**

**2 ½ Hours**

**Uganda Advanced Certificate of Education**

**KISORO VISION SS END OF TERM TWO EXAMINATION 2019**

**BIOLOGY (THEORY)**

**PAPER 1**

**2 HOURS 30 MINUTES**

**INSTRUCTIONS TO CANDIDATES:**

* *Answer all questions in both sections A and B*
* *Answers to Section A questions must be written in the boxes provided*
* *Answers to Section B should be written in spaces provided.*
* *No additional sheets of paper should be inserted in this booklet.*

**FOR EXAMINERS USE ONLY**

|  |  |
| --- | --- |
| **Section** | **Marks** |
| A (1 – 40 ) |  |
| B 41 |  |
| 42 |  |
| 43 |  |
| 44 |  |
| 45 |  |
| 46 |  |
| **Total** |  |

SECTION A

1. Starch and glycogen are suitable storage molecules because they;

A) are large in size which makes them less soluble in water

B) are chemically reactive in cell

C) can easily be hydrolysed

D) exert an osmotic pressure in the cell

2. Two cells A and B have water potentials of -2000 kPa and -1000kPa respectively. Which one of the following statements is true about the cells?

A) cell A has a higher concentration of water molecules than cell B.

B) Cell A has a higher solute potential than cell B

C) there is a net movement of water from cell A to cell B

D) cell A has a less solute concentration than cell B

3. Which one of the following organelles would be most abundant at a site where some embryonic tissues are being discharged?

A) mitochondria B) Ribosomes

C) golgi apparatus D) Lysosomes

4. The figure below shows energy transfer in an ecosystem

300kJ

Tertiary consumers

500kJ

1,000kJ

1,800kJ

Secondary consumers

Primary consumers

Producers

200kJ lost as heat

250kJ lost as heat

100kJ lost as heat

The percentage of energy used for other activities in trophic level 2 is

1. 25% B) 50% C) 75% D) 100%

5. Which one of the following describes facilitated diffusion?  
A) Molecules are moved by protein carriers from a region of high concentration to a region of low concentration

B) Water molecules move across a semi-permeable membrane

C) Molecules move from a region of high to low concentration

D) Energy is used when molecules are moved across a cell membrane

6 . Which one of the following consists of tissues specialized for support?

A) parenchyma and collenchyma

B) collenchyma and sclerenchyma

C) parenchyma and sieve tubes

D) xylem and phloem

7.C3 plants are less efficient than C4 plants in fixing carbon dioxide at low carbon dioxide and high oxygen partial pressure because;

A) C3 plants use more energy

B) in C3 plants, energy is lost

C) RuBP carboxylase is inactivated by high oxygen partial pressure

D) PEP carboxylase has a high affinity for oxygen

8.Which one of the following factors reduces interspecific competition in a community?

A) resource partirioning

B) high intraspecific competition  
C) large number of species

D) similar predator-prey strategies among the species

9 Protein synthesis will not occur in a cell lacking

A. nucleoli and ribosome. C. nuclei and nucleoplasm.

B. ribosome and nucleoplasm. D. endoplasmic reticulum.

10 The enzyme that catalyzes the rearrangement of molecular structure by addition of molecules are called

A. Transferases. C. Isomerases.

B. Oxidoreductases. D. Ligases.

11 The total amount of energy available to a second class consumer will change if

A. second order consumers are removed.

B. higher light intensity is provided.

C. all third order consumers are removed.

D. a constant biomass of producer is a maintained.

12 Walls of plant cells are largely composed of polysaccharides and proteins that are synthesized

A. externally to the plasma membrane.

B. in the smooth endoplasmic reticulum.

C. in the golgi apparatus.

D. in both the rough endoplasmic recticulum and golgi apparatus

13 Which of the following is not an adaption for photosynthesis in shade plants?

A. High chlorophyll content. C. Low compensation point.

B. Thin leaves. D. Thick leaves.

14 The biological role of protein depends on

A. the sequence of amino acids.

B. pattern of folding of amino acids.

C. other protein molecules with which it is associated.

D. its three dimensional shape.

15 Movement of ions and large polar modules across the plasma membrane is repelled by

A. cholesterol. C. phospholipids.

B. glycolipid. D. channel protein.

16 The cell structure lacking elaborate internal structure is the

A. mitochondrion. C. lysosome.

B. centriole. D. endoplasmic reticulum

17 which one of the following organelles will be isolated last by differential cell centrifugation

A Mitochondrion

B Endoplasmic reticulum

C Nucleus

D chloroplast

18 The primary meristematic tissue that gives rise to the cortex in plants is the

A protoderm

B ground meristem

C protoderm

D protoxylem

19 A close relationship between the action spectrum for photosynthesis and absorption spectrum of chlorophylls indicates that .

A all the light absorbed by the chlorophyll is used in photosynthesis

B chlorophylls are responsible for absorption of light in photosynthesis

C photosynthesis proceeds after absorption of light

D light energy is trapped in chlorophyll

20 Energy flow in an ecosystem refers to the energy;

A consumed in total by all organisms

B consumed by organisms at each energy level

C converted from light energy to chemical energy by the primary producers

D transferred from the primary producers through the various consumers

21 During light stage of photosynthesis, water is an important in that it

A gives off oxygen

B provides hydrogen that reduces NAD

Reduces carbon dioxide to carbohydrates

D provides electrons

22 blood worms and liver flukes belong to phylum

A cestoda

B annelida

C nematoda

D platy helminthes

23 The following are true of the epithelial tissue except

A in a simple epithelia, some of the cells touch the basement membrane

B in a compound epithelium, only the lower layer of the cells, touch the basement membrane

C simple epithelium has only one layer of cells

D compound cells have more than one layer of cells

24 cell walls of prokaryotes have cells walls made of a substance called

A hyarulonic acid

B suberin

C murein

D chitin

25 The principal producers in marine ecosystems are

A phytoplanktons

B zooplanktons

C green algae

D detritivores

26 which of the following is an advantage of carbon-3 plants over carbon-4 plants and CAM plants

A dark stage of photosynthesis occurs in only one type of cell

B dark stage of photosynthesis consumes less energy

C dark stage of photosynthesis occurs all day and night

D the plants occupy a wider range of habitants

27 which of the following undergoes isometric growth

A amphibians

B mammals

C birds

D fish

28 which one of the following amino acids is most abundant in the human hair?

A methionine

B cysteine

C tryptophan

D valine

29 The following events occur in a seedling during germination:

(i). Rapid cell division and cell enlargement.

(ii). Production of hydrolytic enzymes.

(iii). Secretion of gibberellic acid.

(iv). Reduction in dry mass of endosperm.

The correct sequence of occurrence is:

A. (i) (ii) (iii) (iv) B. (iii) (ii) (iv) (i)

C. (iii) (ii) (i) (iv) D. (i) (ii) (iv) (iii)

30 When the shoot apex of the growing plant is removed, lateral growth is encouraged because ………….

A. auxins are activated in buds.

B. growth of lateral buds is stimulated by gibberellins.

C. more abscisic acid is produced to promote lateral growth.

D. cytokinins are activated in absence of auxins from apex.

31 The unwinding of DNA helix during transcription process requires the enzyme called …………….

A. DNA ligase. B. DNA polymerase.

C. Helicase. D. RNA polymerase.

32 In HIV virus, the role of enzyme “reverse transcriptase” is to ………

A. unite viral DNA with host’s DNA.

B. release viral RNA to make proteins.

C. transfer DNA from the host into the virus.

D. make DNA from virus RNA.

33 A plant cell is magnified x2000 and the length of one chloroplast is 16mm. What is the actual length of the chloroplast in micrometres?

A. 16 B. 8 C. 1600 D. 32000

34 The genetic condition of spores produced in the sporophyte capsule of bryophyte is …..……..

A. polyploid. B. tetraploid. C. haploid. D. diploid.

35 In insects, the pupa moults into an adult when …………

1. only ecdysone is released.
2. only juvenile hormone is released.
3. both ecdysone and high levels of juvenile hormone are released

both ecdysone and low level of juvenile hormone are released

36 The function of abscission layer is …………

A. instruction information of absorption layer.

B. stimulates disintegration of the middle lamellas.

C. stimulates production of calcium pectate.

D. decrease the sensitivity of the leaves to auxins

37 Which one of the following water relations is not true about a plasmolysed plant cell?

1. Turgor pressure is zero
2. Pressure potential is equal to osmotic potential of sap
3. Pressure potential is zero
4. Water potential of cell is equal to osmotic potential of sap

38 The figure below represents a simplified structure of a phospholipid molecule. Use it to answer question

R

O

O

O

CH2

H2C

O

x

4

3

2

1

P

O

HC

O

O

C

C

O

Which of the following is the hydrophilic part of the molecule?

1. Part labeled 1
2. Part labeled 2
3. Part labeled 3
4. Parts labeled 3 and 4

39 Which of the following events would move energy and materials from a detritus food web into a grazing food web?

1. A beetle feeding the leaves of a living plant
2. An earthworm feeds dead leaves on the fresh flower
3. A bird feeds on earthworm
4. A marabou.stork eats a dead bird

40 The process by which cells undergo mitosis without a corresponding increase in cytoplasm is called?

1. Cleavage
2. Gastulation
3. Organogenesis
4. Induction

**SECTION B (60 MARKS)**

41 (a) Outline the roles of the following compoonents of the cell membranes

(i) phospholipids (03 marks)

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(ii) cholesterol (03 marks)

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(b) explain the roles of the membranes found inside the chloroplast (04 marks)

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42 a) Explain the term gross primary productivity (01 mark)

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(b) Explain why energy transfer from producer to the primary consumer is less efficient compared to energy transfer from the primary consumer to the secondary consumer (05 marks)

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(c) Why is it difficult to have more than four trophic levels in an ecosystem?(02 marks)

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(d) Briefly compare the biomass and productivity of long lived and short lived organisms (02 marks)

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43 (a) Briefly explain the role of pigments in photosynthesis (04 marks)

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(b) Briefly write short notes about the major steps involved in cyclic photophosphorylation (04 marks)

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(c) Briefly explain how the bacteria that live under rocks and leaves of plants in seas and lakes are able to make organic compounds (02 marks)

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44(a) Explain the need for support in plants (02 marks)

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(b) Briefly describe the structure of the collenchyma (03 marks)

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(c) Explain briefly the distribution and function of the collenchyma tissue (03 marks)

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(d) Write down two differences between vessels and tracheids (02 marks)

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45(a) write brief notes on;

(i) Primary structure of proteins (02 marks)

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(ii) tertiary proteins (02 marks)

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(iii) Briefly describe how a polypeptide is formed (03 marks)

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(b)(i) Explain what is meant by protein denaturation (01 mark)

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(ii) Explain any two factors that cause protein denaturation (02marks)

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46 (a) what is meant by the term membrane fluidity?(01 mark)

……………………………………………………………………………………………………………………………………………………………………………………………………………………

(b)(i) Explain any of the three factors that affect the membrane fluidity of the cells (03 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(ii) of what importance has regulating the membrane fluidity got? (01 mark)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(c) Explain why lipid soluble molecules diffuse more rapidly through membranes than lipid insoluble molecules**.** (3 marks)

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(d) Explain the functional significance of cell size and cell shape. (02 marks)

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**Tr LABAN DUNCANS**

**KISORO VISION SS,**

**REALM OF SUCCESS**