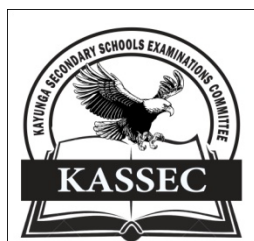


P530/1
Biology
Paper 1
July /August 2019
2 ½ hours



KAYUNGA SECONDARY SCHOOLS EXAMINATIONS COMMITTEE (KASSEC)
Uganda Advanced Certificate of Education
JOINT MOCK EXAMINATIONS 2019
BIOLOGY
PAPER 1
2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES:

- This paper consists of sections A and B

SECTION A

- Write answers to this section in the boxes provided

SECTION B

- Write answers to this section in the spaces provided
- No additional sheets of paper should be inserted in this booklet

FOR EXAMINERS' USE ONLY			
SECTION		MARKS	EXAMINER'S SIGNATURE
A 1 – 40			
B	41		
	42		
	43		
	44		
	45		
	46		
TOTAL			

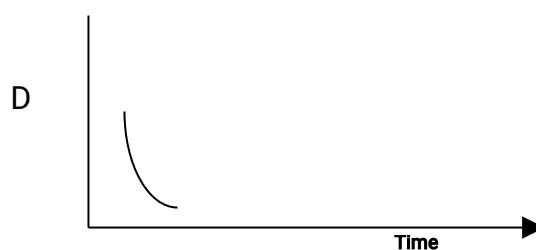
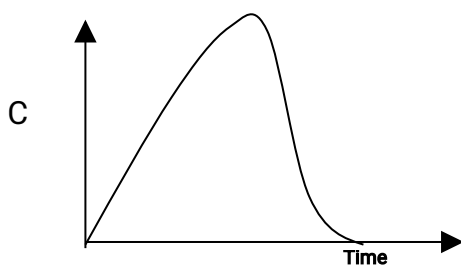
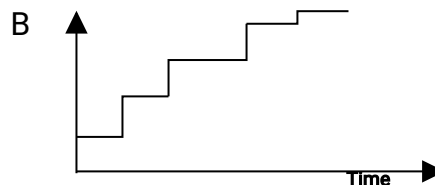
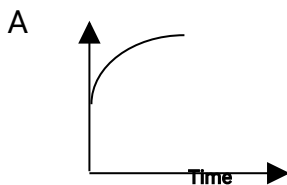
SECTION A

1. Which of the following structures is found in animal cells only?
 - A. Cellulose cell wall
 - B. Mitochondrion
 - C. Cytoskeleton
 - D. Centrosome
2. Which of the following is the shortest stage in mitosis?
 - A. Anaphase
 - B. Telophase
 - C. Metaphase
 - D. Prophase
3. Which of the following compounds is osmotically inactive?
 - A. Glucose
 - B. Sucrose
 - C. Cellulose
 - D. Galactose
4. The tRNA anti- codon that corresponds to the mRNA base triplet CAT is
 - A. GUA
 - B. GUC
 - C. GTC
 - D. GTA
5. The proportions of the F1 generation if a double recessive parent is crossed with a double heterozygous one is?
 - A. 1:1:1:1
 - B. 1:2:2:1
 - C. 9:3:3:1
 - D. 1:3
6. If X molecules of DNA are contained in a cell whose nucleus has just mitotically divided the amount of DNA in the next anaphase stage of mitosis would be
 - A. $\frac{x}{4}$
 - B. x
 - C. $\frac{x}{2}$
 - D. x
7. Triglycerides do not dissolve in water
 - A. They are less dense than water
 - B. Their tails have variable lengths
 - C. They have a higher proportion of hydrogen

- D. Their molecule cannot form hydrogen bonds with water.
8. The parasympathetic nervous system controls;
- A. Fight or flight response
 - B. Increased heart rate and blood pressure
 - C. Increased digestion and decreased heart rate
 - D. Increased release epinephrine and glucose
9. R groups are strongest between associations of
- A. Ionic bonds
 - B. Hydrophobic interactions
 - C. Disulphide bonds
 - D. Hydrogen bonds.
10. Insects with elongated mouth parts usually pollinate long tubular flowers whereas those with short mouth parts pollinate short flowers. This illustrates"
- A. Parallel evolution
 - B. Natural selection
 - C. Co-evolution
 - D. Adaptive radiation
11. The advantage of territoriality in mammals is that it;
- A. Encourages monogamy
 - B. Leads to formation of pair bonds
 - C. Promotes reproductive success
 - D. Allows them evolve
12. A short term physiological adaptation by humans to high altitude is
- A. Increased heart rate
 - B. Concentration of blood
 - C. Increased red blood cell production
 - D. Increased capillary density
13. Movement of long and large polar molecules across the plasma membrane is repelled mostly by;
- A. Cholesterol
 - B. Phospholipids
 - C. Glycoproteins
 - D. Channel proteins.
14. Which of the following is not a function of the larval form during animal development?
- A. Distribution of species
 - B. Feeding and growth
 - C. Asexual reproduction
 - D. Sexual reproduction.

15. The following are typical features of submerged hydrophytes except
- Large floating leaves
 - Elongated leaves
 - Well developed xylem
 - Aerial flowers
16. In order to survive in the sea, a marine teleost
- Loses water and absorbs salts
 - Swallows water and absorbs salts
 - Swallows water and eliminates salts
 - Gains water and eliminates salts.
17. The enzymes that controls mRNA synthesis in the nucleus is
- DNA ligase
 - DNA polymerase
 - RNA ligase
 - RNA polymerase
18. Which of the following animals have most efficient means of gaseous exchange
- Insects
 - Bony fish
 - Amphibians
 - Mammals

19. Which of the following represents an absolute growth rate curve?



20. Which of the following substances is reabsorbed passively in the proximale convoluted tubule and actively in the distal convoluted tubule?
- Glucose
 - Chloride ions
 - Sodium ions
 - Water

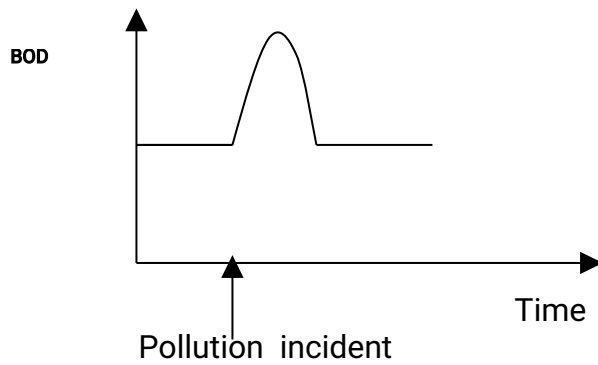
21. Limbs with short thick bones are an adaptation for
- A. Jumping
 - B. Slow locomotion
 - C. Running
 - D. Climbing
22. In a large ecosystem competition between two closely related species over time will result into
- A. Hybridization between the two species
 - B. Equal numbers of each species persisting for a long time.
 - C. Each species occupying a different niche
 - D. Extinction of one of the species.
23. The inheritance of comb shape in fowls is controlled by two dominant alleles **P** and **R**. The probability of producing a homozygous double recessive fowl with no comb, from the parent **PpRr** and **PpRR** is .
- A. 0%
 - B. 25%
 - C. 50%
 - D. 100%
24. Special respiratory organs are absent in an earthworm because
- A. Its not active metabolically
 - B. It has a moist cuticle which dissolves gases
 - C. It lacks a cuticle
 - D. Has a large surface area to volume ratio
25. The tidal volume in an individual whose ventilation rate is 2000dm³/min and takes 10 breaths per minutes is ?
- A. 0.2 dm³
 - B. 2.0dm³
 - C. 200dm³
 - D. 20dm³
26. In a fully contracted muscle fibre the
- A. H- zone disappears
 - B. Filaments shorten
 - C. I-band widens
 - D. Sacromera widens.
27. The most important factor determining how much oxygen is carried by haemoglobin is
- A. Level of oxygen in blood
 - B. Level of carbondioxide in blood
 - C. Temperature of the blood
 - D. Level of Ca²⁺ ions in the blood
28. Impulses transmitted by optic fibres in the retina are generated by

- A. Bipolar neurone
 - B. Rods and cones
 - C. Amacrine cells
 - D. Ganglion cells
29. The pregnancy test on urine is based on the presence of
- A. Follicle stimulating hormone
 - B. Human chorionic gonadotrophin
 - C. Gonadotrophic releasing hormone
 - D. progesterone
30. The following are typical features of xerophytes except
- A. hairy leaves
 - B. fleshy leaves
 - C. large lamina
 - D. thick cuticle
31. In stable environment conditions the rate of evolutionary change:
- A. slow down
 - B. increases rapidly
 - C. remains constant
 - D. increase slowly
32. The roles of B-Cells in the immune system is to
- A. release antibodies into plasma
 - B. stimulate T-cells to divide
 - C. release antigens into the plasma
 - D. engulf antigens.
33. Which of these is the correct sequence of events in a starchy seed?
- A. Production of giberellins → water absorption → hydrolysis of food reserves → enzyme produced.
 - B. Absorption of water → hydrolysis of food reserve → protein synthesis enzymes produced.
 - C. Absorption of water → hydrolysis of food reserve → protein synthesis → enzymes produced.
 - D. Absorption of water → giberellin produced → protein synthesis enzymes produced → hydrolysis of food reserve.
34. Oxides of nitrogen are green house gases because they
- A. Trap long wave radiation emitted by the earth's surface
 - B. Prevent short wave radiation from reaching the earth's surface
 - C. Produce acid rain
 - D. Destroy the ozone layer
35. Prokaryotic cells divide by
- A. Mitosis

- B. Meiosis
 - C. Budding
 - D. Binary fission
36. Which soil would have the smallest number of denitrifying bacteria?
- A. Compressed agricultural soils
 - B. Poorly drained forest soil
 - C. Water logged clay soil
 - D. Well aerated garden soil
37. The total amount of energy available to a second-class consumer in a pond will change if;
- A. Some second order consumers are removed
 - B. Light intensity is increased
 - C. All third order consumers are removed
 - D. A constant biomass of producers is maintained.
38. Which of the following plant tissues provide both a support and storage function?
- A. Collenchymas
 - B. Sclerenchyma
 - C. Parenchyma
 - D. Mesenchyma
39. Enzymes that catalyse re-arrangement of molecular structure by addition or deletion of a molecule are
- A. Transferase
 - B. Oxidoreductase
 - C. Isomerases
 - D. Ligases
40. Which one of the following conversions occurs in humans under conditions of starvation?
- A. Fatty acids to carbohydrates
 - B. Proteins to carbohydrates
 - C. glucose to lipids
 - D. Lipids to lipoproteins.

SECTION B

41. (a) The graph below shows how an incident of animal waste pollution in a small lake affected the BOD over a period of time.



- (i) Explain the immediate effect of the pollution on the BOD. (3marks)

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- (ii) Explain why the immediate effect of the pollution associated with arise in temperature (3marks)

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- b (i) What is an indicator species. (2marks)

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- (ii) State three advantages of using invertebrates that occupy lower trophic levels than predators in an aquatic ecosystem as indicator species.

(3marks)

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42. The table shows the filtrate /plasma ratio of a range of substances

Substance	Filtrate / plasma ratio
Glucose	1
Amino acids	1
Small proteins	0.0002
Medium sized proteins	0.0003
Urea	1

(a)

(i) Explain the ratios in the table.

(4marks)

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(ii) Explain how glucose in the proximal tubule returns to blood.

(3marks)

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(b) Explain the link between amore negative blood solute potential and osmorgulation in the kidney.

(3marks)

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43. The diagram represents a rod cell



(a) (i) Using an arrow show the direction of light entering the retina.(1mark)

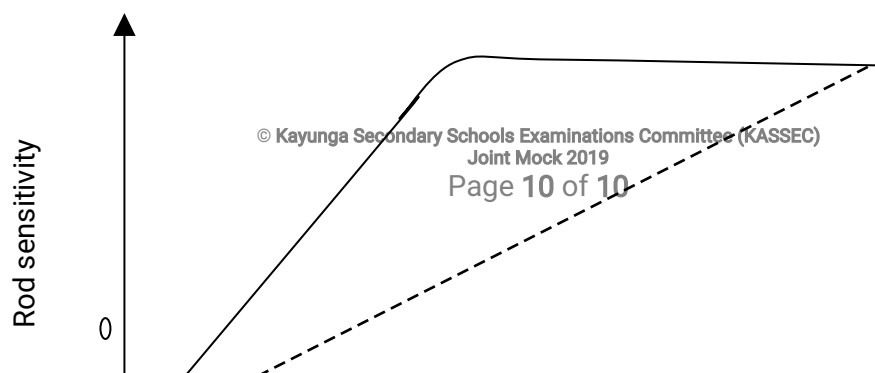
(ii) State the precise function of mitochondria found in rod cells. (1mark)

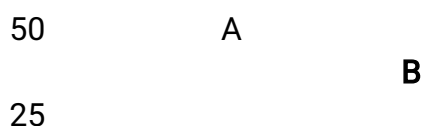
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(c) The graph below shows the results of a response of two individuals A and B subjected to a period of time in very bright light followed immediately by a period of darkness.





Time in darkness / minutes

- (i) Explain the results shown in the graph for individual A. (4marks)

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- (ii) Suggest reasons for the difference in response between individuals A and B.(2marks)

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- (c) Explain why when viewing objects in the night sky, people view them with their eyes at a slight angle rather than focusing directly on the object. (3marks)

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44. A mutation causing the black variety of the peppered moth Biston betularia results in a dominant allele B. By 1900 it had increased to 96% of the population in Britain.

- (a) Calculate the frequency of the dominant allele B in 1900. (4marks)

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- (b) Explain the presence of some light coloured forms of the moth in the population after 1900. (2marks)

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- (c) Explain how resistance to pesticides arise in the peppered moth. (4marks)

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45. (a) State three ways in which appropriate concentrations of solutes are essential in maintaining life processes. (3marks)

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- (b) Explain why:
- (i) Excretion in plants is of less significance than that in animals. (4marks)

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[illegible]

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(ii) increase in CO₂ levels in blood may be lethal. (2marks)

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END