

Name..... Centre/Index No.

Name of School Signature.....

P530/1
BIOLOGY
PAPER 1
July/August 2017
2½ hours



WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Advanced Certificate of Education
BIOLOGY
(Theory)

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of **40** questions in section **A** and **6** questions in section **B**.

Answer **all** questions in both sections **A** and **B**

Section A: Answers to this section must be written in the boxes provided .

Section B: Answers to this section should be written in the spaces provided and not anywhere else.
No additional sheet(s) of paper should be inserted in this booklet.

FOR EXAMINERS' USE ONLY			
SECTION		MARKS	Examiners' initials & No.
Section A:	1- 40		
Section B:	41		
	42		
	43		
	44		
	45		
	46		
TOTAL			

SECTION A (40 MARKS)

Write the letter corresponding to the most correct answer in the box provided on the right.

1. Which one of the following does not belong to the same group as the rest?
 A. Gastropoda.
 B. Cephalopoda.
 C. Pelecopoda.
 D. Diplopoda.

2. Which one of the following pairs of substances constitutes the matrix of hyaline cartilage?
 A. Chondrin and Chondroblasts.
 B. Ground substance and fibroblasts.
 C. Elastic fibres and chondroblasts.
 D. Chondrin and collagen fibres.

3. The component of the water potential which is due to the presence of solute molecules is called
 A. turgor potential.
 B. osmotic pressure.
 C. osmotic potential.
 D. turgor pressure.

4. One advantage of urea excretion over uric acid excretion is that urea
 A. can be concentrated to greater extent.
 B. requires less energy to form than uric acid.
 C. is not a toxic substance.
 D. requires no water to excrete.

5. The NADPH and ATP from the light reactions are used to
 A. cause electrons to move along their pathways.
 B. cause RUBP carboxylase to fix CO_2 .
 C. reform the photosystems.
 D. convert 3PG to G3P.

6. Which one of the following statements is not true of the electron transport chain? The electron transport chain.
 A. is located on the cristae.
 B. produces more NADH than any metabolic pathway.
 C. contains cytochrome molecules.
 D. ends when oxygen accepts electrons.

7. The table below gives difference between normal and cancer cells except;

Normal cells	Cancer cells
A. Differentiated cells	Non differentiated cells
B. Normal nuclei	Abnormal nuclei
C. Disorganised multilayered	One organised layer
D. Undergo programmed cell death	Do not undergo programmed cell death

8. During which mitotic phase (s) are duplicated chromosomes present?
A. All, except telophase.
B. prophase and anaphase.
C. all except anaphase and telophase.
D. only during metaphase at the metaphase plate. ☐
9. A male with under developed testes and some breast development is most likely to be having
A. Down's syndrome.
B. Jacob's syndrome.
C. Turner's syndrome.
D. Klinefelter's syndrome. ☐
10. A human population has a higher than normal percentage of individuals with a genetic disorder. The most likely explanation for this situation is
A. mutations and gene flow.
B. mutations and natural selection.
C. random mating and founder effect.
D. non – random mating and gene flow. ☐
11. All the following are true of negative feedback except;
A. the output cancels the input.
B. there is a fluctuation above and below the set point.
C. there is self-regulation.
D. a regulatory centre does not communicate with other body parts. ☐
12. Which one of the following is the number one global cause of extinction?
A. Exotic/alien species.
B. Habitat loss.
C. Pollution.
D. Over exploitation. ☐
13. Which one of these organisms would normally be found in the benthic zone of a lake?
A. Minnows.
B. Clams.
C. Large fish.
D. Zooplankton. ☐
14. Which one of the following elements is essential for the formation of the central atom in chlorophyll molecules?
A. Magnesium.
B. Iron.
C. Manganese.
D. Phosphorus. ☐
15. Which one of the following correctly describes the location of the organ of corti?
A. Between the tympanic membrane and the oval window in the inner ear.
B. Between the tectorial membrane and the basilar membrane in the median canal.
C. In the utricle and saccule within the vestibular.
D. Between Reissner's membrane and tectorial membrane in the median canal. ☐

16. The type of bond formed when the amino group of one acid reacts with the carboxyl group of another is
- A. a peptide bond.
 - B. a glycosidic link.
 - C. an ionic bond.
 - D. a hydrogen bond.
- ☐

17. Which one of the following pairs of enzymes are involved in the final steps in respiration?
- A. Transferases and phosphokinases.
 - B. Isomerases and transaminases.
 - C. Decarboxylases and dehydrases.
 - D. Dehydrogenases and oxidases.
- ☐

18. The type of gland illustrated in figure 1 below is;

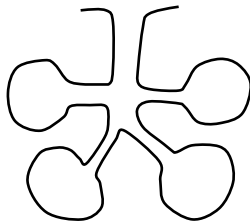


Fig. 1

- A. simple branched tubular.
 - B. simple branched saccular.
 - C. compound tubular.
 - D. compound saccular.
- ☐
19. Which one of the following is NOT a product of hydrolysis of ATP in presence of ATPase?
- A. Adenosine diphosphate.
 - B. Energy.
 - C. Phosphoric acid.
 - D. Water.
- ☐
20. Which one of the following organisms use external gills for gaseous exchange?
- A. Lung worm.
 - B. Flat worm.
 - C. Toad.
 - D. Fish.
- ☐
21. The volume of air breathed in and out normally at rest during a respiratory cycle is called
- A. vital.
 - B. tidal volume.
 - C. residual volume.
 - D. lung capacity.
- ☐
22. Which one of the following cells of the stomach wall secrete hydrochloric acid?
- A. Mucous cells.
 - B. Oxyntic cells.
 - C. Chief cells.
 - D. Epithelial cells.
- ☐

23. Figure 2 below shows the response a long day plant to day length. When will no flowering occur?

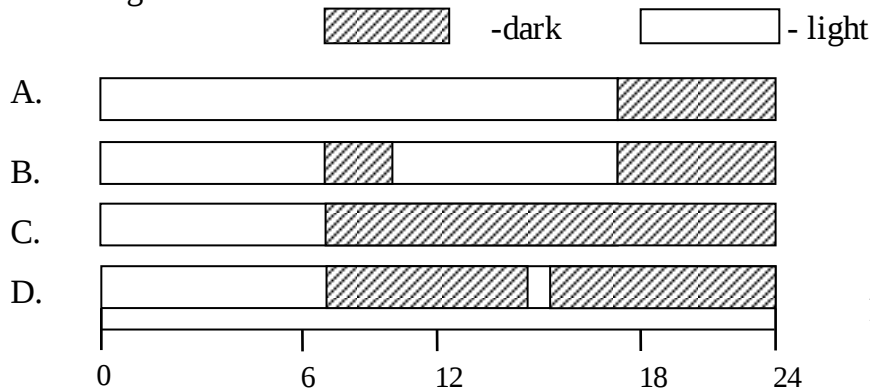


Fig. 2

24. The major function of accessory pigments is that
- they allow chlorophyll to utilise light from only limited parts of the spectrum.
 - they absorb light of all wavelengths and convert it to chemical energy.
 - they increase the range of wavelengths from which the plant can obtain energy.
 - they allow photosynthesis to take place in absence of other factors.
25. Which one of the following cells are a result of the first meiotic division during spermatogenesis?
- Primary spermatocytes.
 - Spermatids.
 - Spermatogonia.
 - Secondary spermatocytes.
26. Ultrafiltration occurs through slits of adjacent specialised cells of Bowman's capsule called
- Kupffer cells.
 - Macrophages.
 - Leydig cells.
 - Podocytes.
27. Which one of the following explains why Mosses do not possess roots, stems and leaves. The body parts are
- haploid.
 - undifferentiated.
 - small sized.
 - Filamentous.
28. Lateral inhibition in the mammalian eye is attributed to
- cones and amacrine cells.
 - amacrine and horizontal cells.
 - horizontal and cone cells.
 - cones and rods only.
29. The gene that causes albinism in humans is associated with loss of melanin pigment in the skin, grey hair and pink eyes. The gene is therefore said to be
- polygenic.
 - epistatic.
 - Pleiotropic.
 - codominant.

30. Increased speed to capture or avoid being captured overtime in both populations of cheetah and antelopes respectively is an example of
- stabilising selection.
 - disruptive selection.
 - convergent evolution.
 - directional selection.

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31. Figure 3 below shows the promotion of lateral bud growth in intact pea shoots following the application of kinetin.

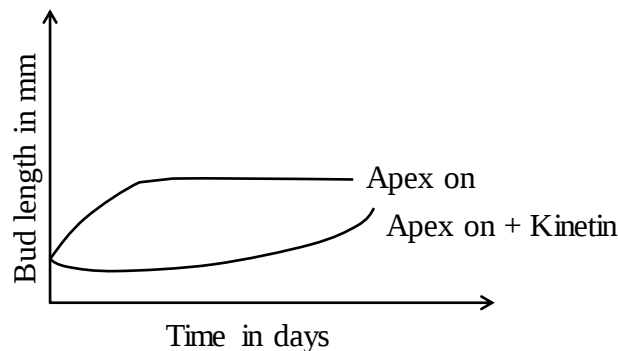


Fig. 3

The results of this experiment show that kinetin.

- Suppresses apical dominance in intact shoots.
 - suppresses bud dormancy.
 - promotes apical dominance in intact shoots.
 - promotes bud dormancy.
32. Plant stem primary meristems are;
- apical meristem, vascular cambium , cork cambium.
 - epidermis, apical meristem, vascular cambium.
 - vascular cambium , protoderm and procambium.
 - ground meristem, protoderm and procambium.
33. Which one of the following is NOT true during hormonal control of breathing?
- Impulses from chemoreceptors in the aorta and central arteries stimulate the respiratory centres to increase rate of respiration.
 - Stretch receptors in the bronchioles monitor the amount of lung ventilation.
 - Cerebral cortex allows voluntary control of breathing.
 - Vagus nerve carries impulses from the respiratory centre to stretch receptors to stimulate inspiration.
34. Which one of the following factors does not affect height in a gliding bird?
- increased size of wings.
 - shape of the wings.
 - metabolic rate.
 - angle of attack.
35. Which one of the following is NOT a pre-mating isolation mechanism?
- Seasonal isolation.
 - Behavioural isolation.
 - Prevention of fertilization.
 - Habitat isolation.

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36. The spore – bearing structure that gives rise to a female gametophyte in seed plants is called a
- microphyll.
 - sporophyll.
 - microsporangium.
 - megasporangium.
37. In nervous coordination, saltatory conduction improves conduction speed by
- increase in diameter of axon.
 - having a myelinated axon.
 - having a non-myelinated axon.
 - decrease in diameter of axon.
38. The initiation of refilling of the atria by blood under low pressure during cardiac cycle is due to
- simultaneous atrial and ventricular diastole.
 - relaxation of the arterial wall and contraction of the ventricle.
 - ventricular systole.
 - ventricular diastole.
39. During protein synthesis, translation occurs
- inside the nucleus.
 - in the cytoplasm.
 - on the ribosomes.
 - on the nucleus membrane.
40. Which hormone is secreted by the placenta during early stages of pregnancy and delays degeneration of corpus luteum?
- progesterone.
 - chronic gonadotrophin.
 - oestrogen.
 - human placenta lactogen.

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SECTION B (60 MARKS)

41. (a) State three distinguishing features of an epithelial tissue. (03 marks)
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- (b) Describe the structure of a squamous epithelium. (03 marks)
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- (c) State four structural differences between a vessel element and a tracheid. (04 marks)
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42. Figure 4 below shows the effects of chilling on hormones abscissic acid and gibberellins concentrations in the seeds of sugar maple with time.

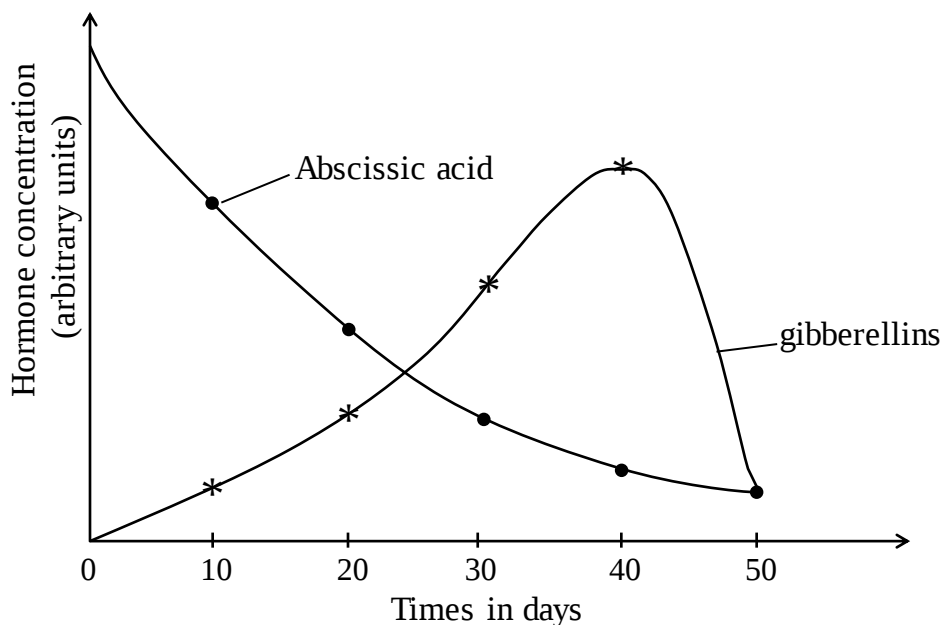


Fig. 4

- (a) State three differences observed in the concentration of the named hormones in the seeds of sugar maple. (03 marks)

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- (b) Explain the variation in gibberellins concentration with time. (02 marks)

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- (c) (i) State two structural causes of seed dormancy. (02 marks)

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- (ii) State three instances where low temperature treatment has been used to initiate development following seed dormancy. (03 marks)

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43. (a) Figure 5 below shows anaerobiosis in a muscle.

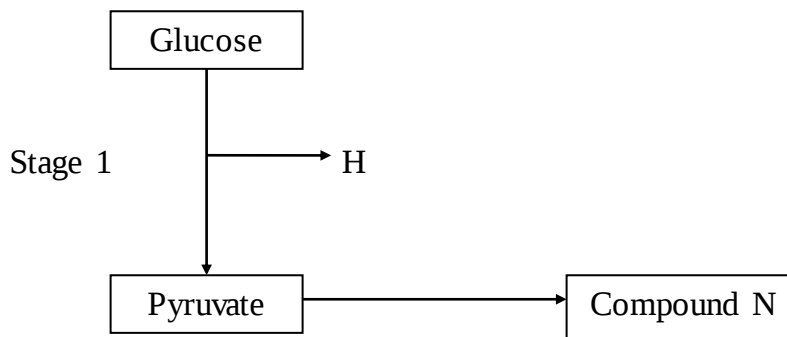


Fig. 5

- (i) What happens to the hydrogen atoms removed at stage 1. (01 marks)

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- (ii) Identify compound N. (01 marks)

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- (iii) Explain why it is important to convert pyruvate to compound N. (01 marks)

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- (b) Describe how pyruvate is converted into compound N. (03 marks)

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- (c) What is the benefit of prolonged glucose breakdown during cellular respiration? (01 mark)

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- (d) State three ways in which the body utilises ATP. (03 marks)

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44. Figure 6 below shows the changes in permeability of an axon cell surface membrane to sodium and potassium ions.

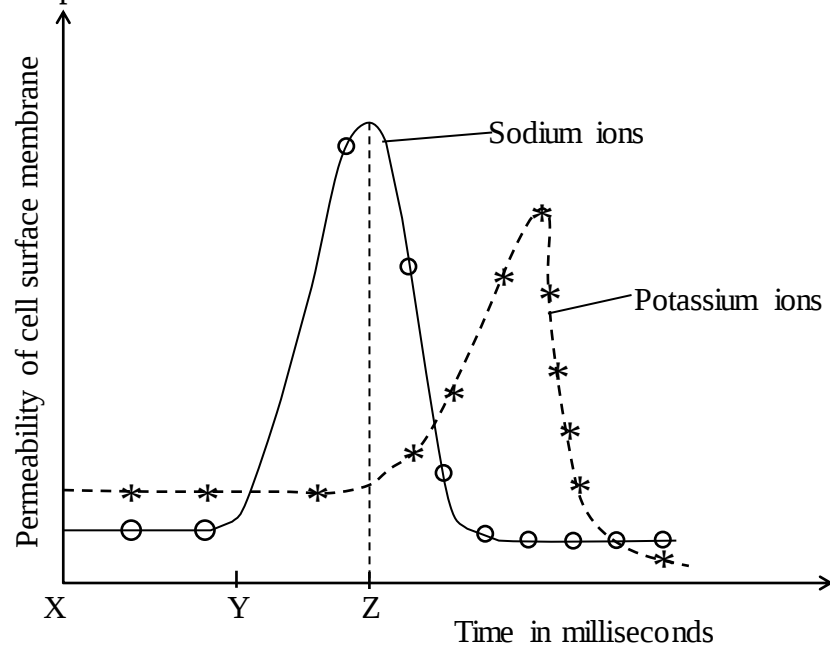


Fig. 6

- (a) Explain the permeability of the cell surface membrane to:
- (i) Sodium and potassium ions between X and Y. (02 marks)

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- (ii) Sodium ions between Y and Z. (02 marks)

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- (b) (i) Describe how the sensory system creates an impulse. (03 marks)

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- (ii) Explain how a resting potential is actively maintained along an axon. (03 marks)

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45. (a) (i) Define Osmoregulation. (01 mark)

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(ii) What osmoregulatory problems are faced by small rodents like the Kangaroo rat living in dry environments. (02 marks)

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(b) (i) Mention three physiological adaptations of arid rodents to scarcity of water. (03 marks)

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(ii) State one life style in the Kangaroo rat to avoid extreme diurnal heat. (01 mark)

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(c) Explain why marine bony fish drink vast quantities of water unlike fresh water bony fish. (03 marks)

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46. Figure 7 below shows the result of three experiments on the effects of varying light intensity on the rate of oxygen production in water weeds exposed to different environmental conditions as shown below.

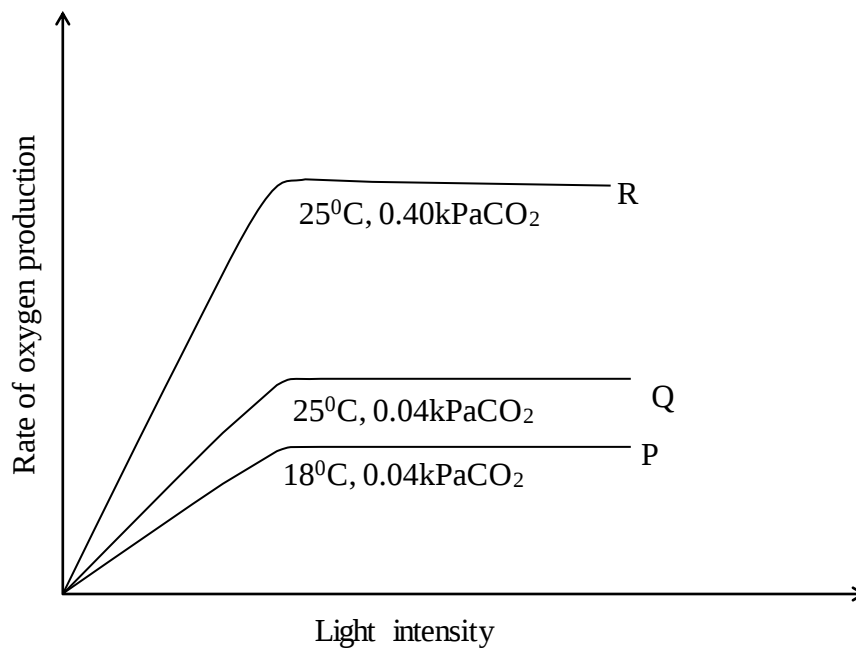


Fig. 7

- (a) Compare the rate of Oxygen production in curves P and Q. (02 marks)
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- (b) (i) Suggest the factors which have been varied to produce the results in curves P, Q and R. (02 marks)
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- (ii) State two factors responsible for levelling off of curves R and Q (02 marks)
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- (c) State the biological principle underlying the results portrayed by the curves P, Q and R. (01 mark)
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- (d) Give three evidence to show that the process resulting into oxygen production in the water weeds occurs in stages. (03 marks)
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END