KIIRA COLLEGE BUTIKI

Uganda Advanced Certificate of Education

BIOLOGY

Paper 1
LOCK DOWN REVISION QUESTIONS 2020

SECTION A (40MARKS)

1. The presence of cholesterol in cell membrane structure
   A. decreases its permeability
   B. decreases its stability
   C. increases its permeability
   D. allows lipid-soluble molecules to pass through

2. Which of the following is not a function of the Golgi body and vesicles?
   A. Production of glycoproteins
   B. Packaging and secretion of enzymes
   C. Destruction of lysosomes
   D. Formation of cell walls in plant cells.

3. The specific sequence of three bases on the tRNA molecule is called
   A. anticodon
   B. codon
   C. a gene
   D. base triplet

4. In Bryophytes, the male sex organ of the gametophyte is called
   A. protonema
   B. antheridium
   C. archegonium
   D. sporogonium

5. Which of the following statements is false? Non essential amino acids are
   A. made in the liver by transamination
   B. a vital constituent of the diet
   C. used in protein synthesis

D. found in animal and plant proteins

6. The African lung fish, pnotopterus, burrows and encases itself in a cacoon of hard mud line with mucus. This dormancy is called
   A. aestivation
   B. diapause
   C. hibernation
   D. encysting

7. The learning that involves immediate understanding and correct response to a new situation is called
   A. exploratory
   B. insight
   C. associate
   D. imprinting

8. The stroma of the chloro plast is the site for
   A. photolysis
   B. photophosphorylation
   C. carbohydrate synthesis
   D. oxidative phosphorylation

9. to In Drosophila melanogaster, the gene for red eye(R) and normal wing(W) are dominant alleles(R) for purple eye and (w) for vestigial wing. Crosses between a fly of genotype RrWw and rrww yielded offsprings as follows:
   Red eyes, normal wings 40%
   Red eyes, vestigial wings 10%
   Purple eyes, vestigial wings 40%
   Purple eyes, normal wings 10%
   These results illustrate:
   A. crossing over
   B. hybridization
   C. sex linkage
   D. mutation

10. Mongo loid idiocy in humans is due to inheritance of
   A. one x chromosome
   B. one y chromosome
   C. one autosome
   D. both x and y chromosomes

11. Where in the mito chondrion is the respiratory chain located?
    A. Mitochondrial matrix
    B. Cristae
    C. Outer membrane
    D. Intra membrane cavity

12. A muscle tissue that is both striated and involuntary is
    A. smooth muscle
    B. skeletal muscle
    C. muscle
    D. skeletal and cardiac

13. Which type of epithelium is found in the epidermis?
    A. Squamous
    B. Columnar
    C. Cuboidal
    D. Pseudostratified

14. The functional resemblance between the wing of an owl and the wing of a butterfly is an example of
    A. homology
    B. outogeny
    C. phylogeny
    D. analogy

15. Which one of the following is a different taxonomic hierarchy?
    A. Amphibia
    B. Bryophyta
    C. Annelida
    D. Platyhelminthes

16. Which one of the following is not considered evidence that primates originated as arboreal animals?
    A. Great flexibility of the shoulder and elbow joints
    B. A stout but wide pelvis
    C. Stereoscopic vision
    D. Protective nails

17. The correct combination of molecules for the unit membrane is

A. lipid, protein, lipid
B. protein, lipid, Protein
C. protein, lipid, cholesterol
D. protein, cholesterol, lipid

18. Why do isolated cells of multicellular plants fail to survive?
A. They lack plasmodesmata
B. They lose their protoplasts
C. They lose essential enzymes during isolation
D. The cell walls are removed during isolation

19. At which stage during meiosis does pairing of chromosomes occur in prophase 1?
A. Diplotene
B. Zygotene
C. Leptotene
D. Pachytene

20. Which of the following are in higher plants?
1. Centrioles 2. Flagella 3. Golgi bodies 4. Mitochondria
A. All of them
B. 1 and 2
C. 3 and 4
D. 4 only

21. Which one of the following is a purine organic base?
A. Thymine
B. Cytosine
C. Guanine
D. Uracil

22. In which one of these stages of spermatogenesis are the germ cells haploid?
A. Primary germ cell
B. Primary spermatocyte
C. Secondary spermatocyte
D. Spermatogonia

23. Sertoli cells
A. give rise to spermatogonia
B. provide nutrients to developing spermatozoa
C. divide to give rise to secondary spermatocytes

D. destroy sterile spermatozoa.

24. The genetic code is constituted by
    A. one base pair
    B. two base pairs
    C. three base pairs
    D. four base pairs

25. A mature ovum of an animal contains twelve chromosomes. How many pairs of chromosomes will a primary oocyte of the same animal have?
    A. 6
    B. 12
    C. 24
    D. 48

26. Which one of these is not a Eukaryote?
    A. Bacteria
    B. Fungi
    C. Animals
    D. Green plants

27. From which of the following tissues do root hairs develop?
    A. Epidermis
    B. Piliferous layer
    C. Cuticle
    D. Cortex

28. Which one of these is likely to have the greatest concentration of mitochondria?
    A. Brain
    B. Skeletal muscle
    C. Kidney
    D. Heart

29. The primary structure of a protein refers to
    A. molecular configuration of the protein molecule
    B. the surface configuration of the protein muscle
    C. the number of amino acid composition of the protein
    D. the number and sequence of amino acids making up the protein

30. Which one of the following ions is necessary for mRNA to be attached to the surface of the ribosome?
    A. Mg^{2+}
    B. Ca^{2+}
    C. Na^{+}
    D. Cl^{-}

31. Newly synthesized polynucleotide chains are joined together by action of an enzyme called
    A. DNA – ligase
    B. DNA – polymerase
    C. Amino acyl + RNA synthetase
    D. Nuclease

32. Which of the following are non living?
    A. Xylem, collagen, elastic fibres
    B. Phloem, xylem and collagen
    C. Elastic fibres, phloem and meristem
    D. Meristem, cambium and cork.

33. Organisms which have similar ecological requirements are best described as
    A. symbionts
    B. trophic similes
    C. ecological dominants
    D. ecological equivalents

34. Pheromones can be defined as
    A. chemical substances produced by one animal for influencing the behavior of another
    B. chemical substances produced by an animal which have influence on its own behavior.
    C. type of hormones which produce odour to influence an animal's behavior.
    D. natural substances which are produced by animals to induce a specific behavior.

35. Which of the following is not true of mutation?
    A. Haemo philia
    B. Cretinism
    C. Cystic fibrosis
    D. Sickle cell anaemia

36. Which of the following could best account for the formation of new species in plants?
    A. In breeding
    B. Out breeding
    C. Artificial propagation
    D. Polyploidy

37. The function of the pnotractor muscles of the limb is to pull the
    A. base of the limb backwards
    B. base of the limb forewards
    C. limb inward towards the body
    D. limb outwards away from the body

38. Which of the following supplies oxygenated blood to the foetus?
    A. Umbilical vein
    B. Umbilical artery
    C. Placenta
    D. Utero-ovarian shunt vessel

39. Which of these is a characteristic of insight learning?
    A. Remembrance of essential features
    B. Complete mastery of a task without trial error
    C. Conscious comprehension of a situation
    D. Modification of response in accordance with environmental demand

40. Which of the following is not an effector?
    A. Muscles
    B. Chromatophores
    C. Nematoblasts
    D. Skin

Answer sheet for section A

1	**11**	**21**	**31**
2	**12**	**22**	**32**
3	**13**	**23**	**33**
4	**14**	**24**	**34**
5	**15**	**25**	**35**
6	**16**	**26**	**36**
7	**17**	**27**	**37**
8	**18**	**28**	**38**
9	**19**	**29**	**39**
10	**20**	**30**	**40**

SECTION B: (60 MARKS)

41. (a) What is meant by the term serum? (1 mark)

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(b) In trying to find out their own blood groups, four pupils in a class mixed drops of their own blood with different kinds of serum.
Paul got agglutination with anti-A serum but not with anti-B
Canon got agglutination with anti-B serum but not with anti-A
Pauline got no agglutination with either serum.
Peace got agglutination with both sera.

(i) Which blood group does each pupil belong to? (4 marks)

Pupil	Blood group	Anti body in blood
Paul		
Canon		
Pauline		
Peace		

(ii) What can you say about the substances in Pauline's red blood cells? (1 mark)

_____

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(iii) Whose blood group is needed most in blood donation centres and why: (2 marks)

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(c) What causes agglutination? (2 marks)

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42. (a) How have mosses been suited to reproduction in terrestrial life? (3 marks)

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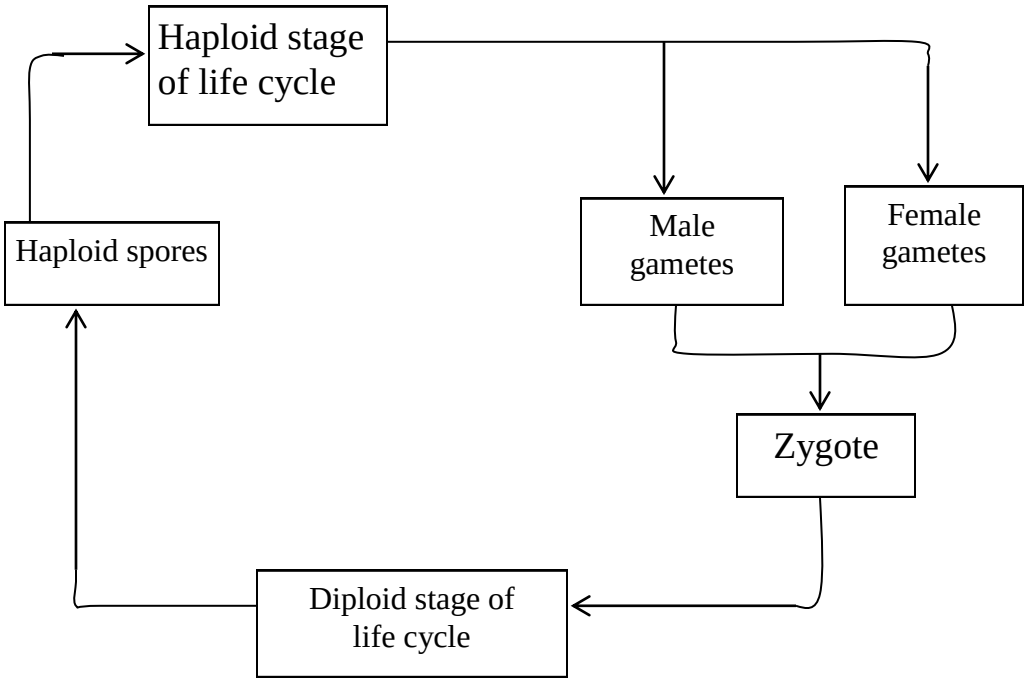
(b) Figure 1 below shows the life cycle of a moss. Mark with a cross to show where meiosis occurs. (1 mark)



(c) A spore of this organism contains 16 chromosomes. How many chromosomes would you expect to find in:

(i) a female gamete (1 mark)

_____

(ii) a cell taken from the moss during the diploid stage of its life cycle? (1 mark)

_____

(d) Some DNA was extracted from cells during the diploid stage of the cycle. It was found to contain 14% adenine.

(i) What % of thymine would you expect this DNA sample to contain? (1 mark)

_____

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(ii) What % of cytosine would you expect to find in this DNA sample? (1 mark)

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(e) Suggest two ways in which the male gametes of this organism are likely to differ from female gametes? (2 marks)

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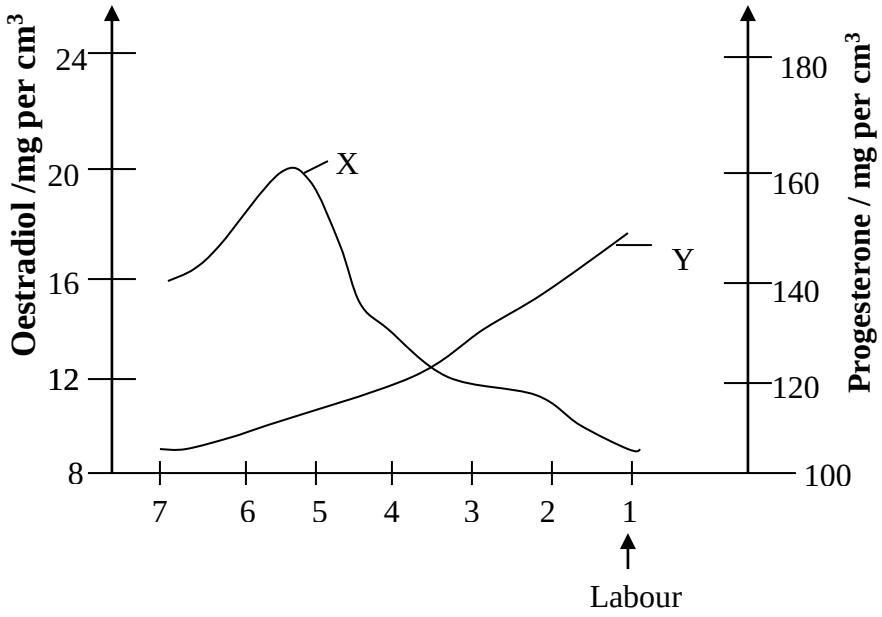
43. The graph below shows the mean concentrations of progesterone and oestradiol (an oestrogen) hormones in blood of 33 pregnant women during the seven weeks before on set of labour.



(a) Name the hormones represented by the letters X and Y (1 mark)

(i) X_____

(ii) Y_____

(b) (i) Briefly describe the changes shown on the graph (3 marks)

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(ii) Give reasons for the changes described in (i) above. (2 marks)

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(c) What is the role of the placenta to a pregnant mother? (4 marks)

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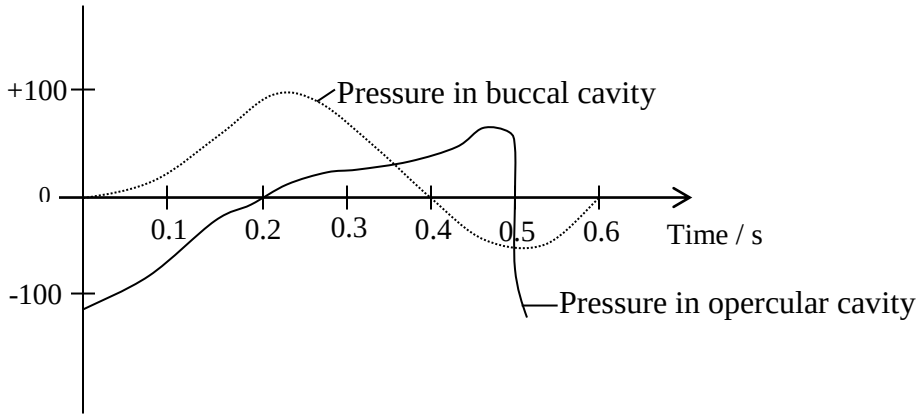
44. (a) What is ventilation rate? (1 mark)

(b) The figure below shows the changes in pressure in the buccal cavity and in the opercular cavity during the ventilation cycle in a fish.



(i) Calculate the rate of ventilation in cycles per minute (2 marks)

(ii) Explain how the fish increases pressure in the buccal cavity. (2 marks)

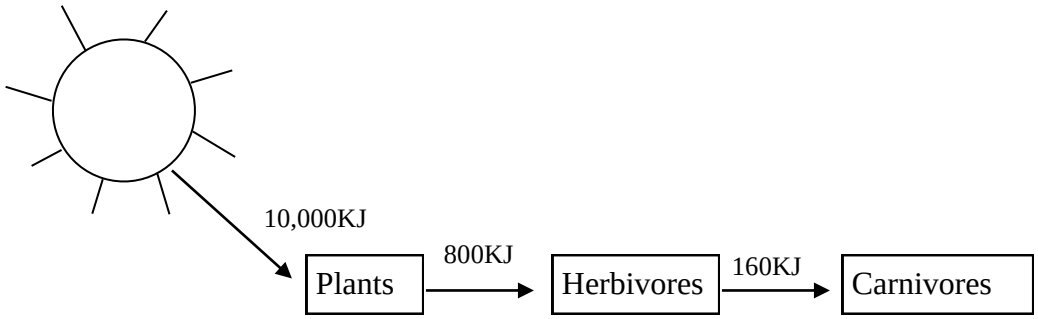
(c) How is the tracheal system adapted to gaseous exchange? (5 marks)

45. (a) What are viruses? (2 marks)

(b) Why are viruses referred to as living things (5 marks)

(c) State three structural differences between a virus and bacteria. (3 marks)

46. The figure below illustrates energy flow through a grazing food chain. Study it carefully and answer the questions that follow.



(a) Assuming a 10% energy loss at each trophic level, calculate the energy retained by herbivores. (3 marks)

(b) Explain why energy transfer from herbivores to carnivores is more efficient than from producers to herbivores. (3 marks)

(c) Despite the transfer from herbivores being more efficient, it is not readily 100%. Suggest reasons for this fact. (2 marks)

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(d) State factors that limit the number of tropic levels in a food chain. (2 marks)

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