Name……..……**Stream**……

Sign……

(Write your name and stream in the spaces provided)

530/1
BIOLOGY
(Theory)
Paper 1
MARCH.2024
2½hours

CODE HIGH SCHOOL SEETA BAJJO-MUKONO
BEGINNING OF TERM ONE EXAMINATIONS 2024
BIOLOGY
PAPAR 1
S.6
TIME: 2 ½ HOURS

Instructions to candidates:
Answer all questions in both sections A and B

SECTION A:

Answers to section A must be written **as letters** in the corresponding boxes.
Answers to section B must be written in the spaces provided not anywhere else.
Any additional sheets of paper inserted in this booklet will not be marked.

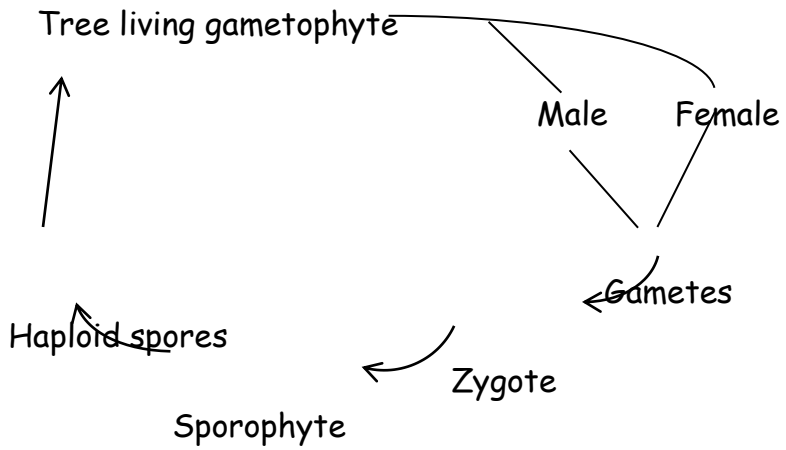
SECTION A: (40 MARKS)

Select the most appropriate answer and indicate it on the answer table above as letters in the corresponding columns.

1. In vascular plants, hormones are transported through

A: sieve tubes B: companion cells
C: xylem vessels D: cortical cell

2. Below is a summary of the life cycle of a plant



Identify the plant:
A: Colonial algae B: moss
C: flowering plant D: unicellular algae

3. Which one of the following is not a respiratory surface?
A: spiracle B: tracheoles C: slan D: alveolus

4. Which of the following are adaptation of the red blood cells to transport as much oxygen as possible?
   1. are very many
   2. are biconcave
   3. have no nucleus
   4. have haemoglobin
   5. are red in colour

A: 1,2 and 5 B: 1,2 and 3 C: 1,3 and 4 D: 2,3 and 4

5. Three cells A,B and C as shown in table 1 below are placed in contact with each other. Their membranes are permeable only to water

Table II

A	B	C
O.P = 16 atm T.P = 3 atm	O.P = 13.5 atm T.P = 8.2 atm	O.P = 19.7 atm T.P = 14.4 atm

O.P = Osmotic pressure TP = Turgour pressure

In which direction will water move?

A: from cell A to cell B
B: from cell B to cell C
C: from cell C to cell B
D: from cell B to cell A

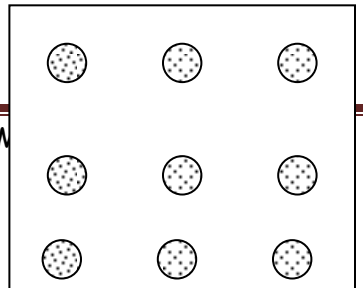
6. The most abundant protein is believed to be:
   A: Pepsin
   B: RUBP carboxylase
   C: Salivary amylase
   D: Succinate dehydrogenase

7. During gaseous exchange, termination of inspiration is caused by
   A: vagus nerve
   B: stretch receptors
   C: Afferent nerve
   D: expansion of the lungs

8. In which prophase stage are chromosomes longer and thinner?
   A: zygotene B: pachytene C: leptotene D: Diplotene

9. Which one of these processes enables fertilisation to occur inside the body of female terrestrial animals?
   A: copulation
   B: acrosome reaction
   C: courtship
   D: polyspemy

10. Figure 2 below illustrates animal distribution



Which one of the following statements is not true regarding the distribution pattern of the animals?

A: it is both random and non random

B: There is both over dispersion and under dispersion

C: The pattern is entirely non random

D: the groups are over dispersed but the members within the group are under dispersed.

11. Which one of the following is the mother cell from which the ovum is developed?
    A: Oogonion B: Primary gem cell
    C: primordialgerm cell D: secondary Oocyte

12. Which one of the following types of learning involves the immediate understanding and response to a new situation?
    A: imprinting B: Associative learning
    C: Insight learning D: Exploratory learning

13. The most critical factor that pre-occupies land plants is to ensure that they:
    A: are pollinated B: Receive adequate sunlight
    C: have adequate water D: have carbondioxide gas.

14. Self pollination in flowering plants may be inhibited by
    A: Anthers outside the perianth B: monoecrous condition
    C: Anthers shorter than the stigma D: Dioecious condition

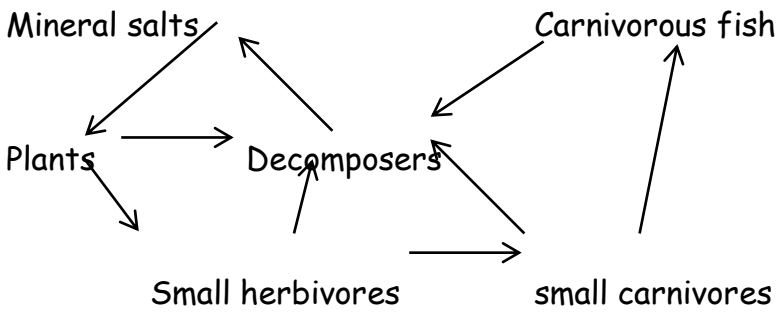
15. Chloride ions (Cl^-) are necessary for the proper functioning of salivary amylase, enzyme. Cl^- act as:
    A: prothetic groups B: Activators C: Cofactors
    D: coenzyme

16. Which of these techniques is suitable for determining the distribution of plant species in open grassland?
    A: Belt transect B: profile transect
    C: line transect D: random quadrant

17. During the Oestrous cycle, the amount of progesterone in blood increases steadily from ovulation to menstruation, then it begins to decline. It declines because
    A: Leutenising hormone inhibits its production
    B: it is carried out with blood during menstruation
    C: implantation of a zygote has not occurred
    D: its work of repairing the uterine wall is over

18. In plants, the problem of obtaining oxygen for purposes of respiration is solved by
    A: very large intercellular spaces in their tissues
    B: A compact palisade mesophyll
    C: A thin lower epidemis, and thick upper epidermis
    D: A compact spongy mesophyll.

19. A small lake in the middle of a rich agricultural land was discovered to contain more carnivorous fish than had been expected. It was more suggested that this was due to some of the fertilisers that was being added to the surrounding land reaching the lake after rain. Study the diagram of the food web of the community in figure 3 below and choose the most likely explanation for the increase in carnivorous fish



A: Plant growth has increased due to fertilisers
B: The growth of the fish has been stimulated by the fertilisers
C: fertilisers have increased the amount of energy taken into the habitat
D: extra nutrients have stimulated the production of growth hormones in the fish

20. What do you understand by the term ecdysis? It is
A: the drastic transformation of a larva into an adult
B: the shading of a hard cuticle
C: The secretion of a new cuticle by the epidermis
D: the synthesis of thyroxin by the thyroid gland

21. Companion cells are a distinguishing feature of
A: Pteridophytes B: Gymnosperms
C: Angiosperms D: Bryophytes

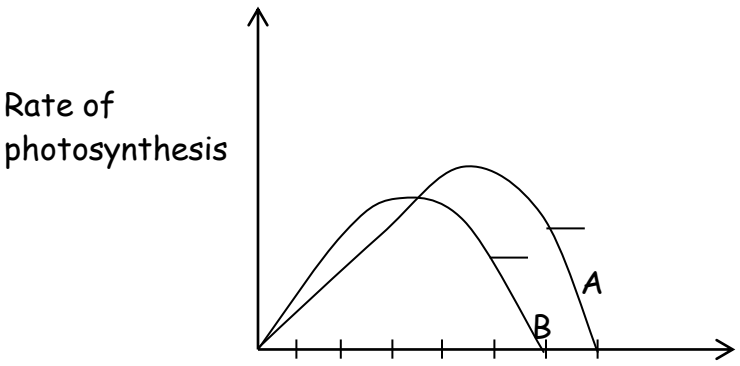
22. What type of reproductive process results in the production of a hybrid?
A: self fertilisation in hermaphrodite
B: mating closely related individuals with a recessive parent
C: Back crossing of an individual with a parent of recessive parents.

23. Which one of the following animals has a double circulatory system?
A: fish B: Octopus C: Frog D: Squid

24. Which of the following enzymes is important in hormonal formation?
A: Peroxidase B: Dehydrogenase
C: Deaminase D: oxidase dehydrase

25. Which one of the following best explains why the pulmonary ventilation is greater than the volume of the alveolar air?
A: because the dead space air forms part of the pulmonary ventilation volume
B: because during pulmonary ventilation, all the respiratory reserve volume is expelled
C: Because the pulmonary ventilation incorporates the vital capacity of the lungs
D: because during pulmonary ventilation, the rib cage and the diaphragm muscles contract greatly such that the thoracic cavity volume is increased greatly.

26. The results depicted in figure 4 below illustrate the relationship between temperature and the rate of photosynthesis of two plant species A and B



The best conclusion which may be drawn from these results, would be
A: B is a shade plant while A is a sun plant
B: B has a higher carbondioxide compensation point than A
C: A is a tropical species while B is a temperate species
D: A has a high optimum temperature for photosynthesis than B

27. Which one of the following pairs is caused by un equal distribution of auxins in plants?
A: Photoperiodism and phototropism
B: Geotropism and phototropism
C: Nastic movements and Geotropism
D: Photoperiodism and abscission

28. Which one of the following is a storage substance in both plants and animals?
A: insulin B: Glycogen C: lipids D: sucrose

29. Growth of bacteria in a culture medium would not be affected by
A: other microbes present B: light

C: Nutrients in the culture D: size of the culture

30. What is the consequence of breathing air containing 5% carbondioxide?
    A: The pit of arteriole blood increases
    B: the cardiac frequency falls
    C: lung ventilation rate increases
    D: the oxygen concentration in blood decreases

31. Haemophilia is caused by a recessive gene and is sex linked; it occurs mainly in males. If a haemophiliac male marries a carrier female, what will be the percentage of haemohiliac daughters among the children?
    A: 0 B: 25 C: 50 D: 75

32. The actual diameter of a certain unicellular alga is 20.0μm, but when viewed under the light microscope, it appears to have a diameter of 10mm. What is the magnificence of the microscope used?
    A: 5×10^2 B: 5×10^3 C: 5×10^4 D: 5×10^5

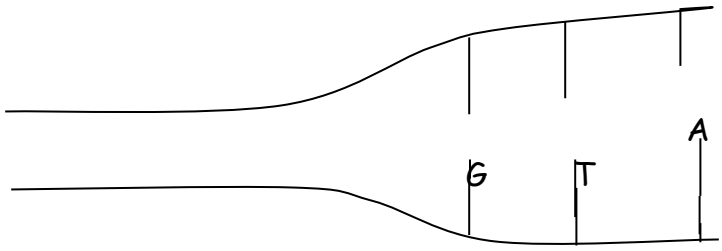
33. The significance of vascularisation of the endometrium before implantation in mammals is to
    A: Ensure firm attachment of the foetus onto the uterine wall.
    B: prevent menstruation
    C: assist in producing hormones which maintain pregnancy
    D: facilitates food and oxygen supply to the foetus and removal of excretory products.

34. Auxins are often used as selective weed-killers on lawns because
    A: same dosage affects different plants differently
    B: they can be manufactured artificially
    C: Auxins always kill dicotyledonous plants when applied externally
    D: Auxin concentration increases on contact with weeds on lawns.

35. Very small mammals cannot live at altitudes of over 3500 metres on the mountains of East Africa because:
    A: they would lack suitable food materials
    B: they lack sufficient fur to keep warm
    C: their surface area to volume ratio is too high

D: at such high altitude, the oxygen partial pressure is too low.

36. Figure 5 below represents an unzipped portion of a DNA molecule



The sequence of bases that would be transcribed on a messenger RNA from the lower strand would be

A: GTC B: GUA C: CAT D: CAU

37. Which of the following groups of temestial animals conserves body water most efficiently?

A: mammals B: Insects C: birds D: Reptiles

38. To which one of the following phyla does a flat worm belong?

A: Nematoda B: Arthropoda

C: Platyhelminthes D: Coelenterates

39. Chromatophores are

A: Reproductive cells B: Fat containing cells

C: carotenoid containing cells D: Pigment containing cells

40. The main function of the kupfter cells of the liver is to:

A: elminate sex hormones B: from red blood cells

C: eliminate haemoglobin D: Destroy old red blood cells.

SECTION B (60 MARKS)

Answer all questions in this section in the spaces provided.

41. (a) Distinguish between aerobic and anaerobic respiration

……

……

….

(b) Write word equations to show what happens to pyruvate under anaerobic respiration in

(i) plant

……

……

….

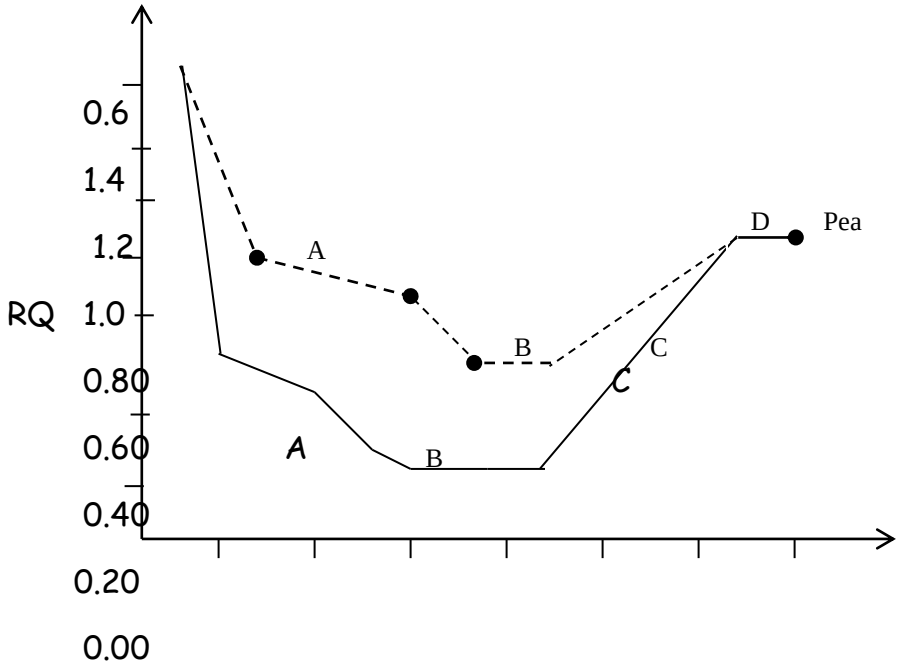
(ii) animals

……

……

….

(c) The graph below shows changes in the respiratory quotient of seeds of pea and castor oil during germination



1 2 3 4 5 6 7

Time from start of germination (days)

(i) During the first 24 – 28 hours of germination, the RQ value of both seeds can be greater than 1. State the type of respiration responsible for such RQ value.

(1 mark)

……

(ii) State and explain two reasons for your choice (3 marks)

……

……

……

(iii) Account for the respiratory substance in the following regions

(3 marks)

A ……..

……

B ……

……

D……..

……..

(iv) Explain what happens at region C

……..

……..

……..

……..

……..

42. (a) Give structural differences between the Eukaryotic and prokaryotic cell

……

……

……

……

……

……

(5 marks)

(b) Name two processes taking place in the nucleoplasm of an Eukaryotic cell

……

……

(1 mark)

(c) Give two functions of the cytoplasm of an animal cell.

……

……

……

……

(2 marks)

(d) Apart from the mitochondria and plastids name one other organelle found in the cytoplasm and its function

……

……

……

……

(2 marks)

43.(a) Explain the following

(i) competitive inhibition

……

……

……

……

(2 marks)

(ii) Non competitive inhibition

……

……

……

……

(2 marks)

(b) In what ways do enzymes differ from catalysts?

……

……

……

……

……

……

(4 marks)

(c) Briefly describe the lock and key hypothesis of enzyme action

……

……

……

……

(2 marks)

44.(a) Why is it not true to refer to interphase as a resting stage?

……

……

……

……

……

……

(3 marks)

(b) Name two processes which ensure that each of the two daughter cells from mitosis remain diploid as the mother cell

……

……

(1 mark)

(c) Give any two similarities and four differences between mitosis and meiosis

Similarities

……

……

(4 marks)

Differences

……

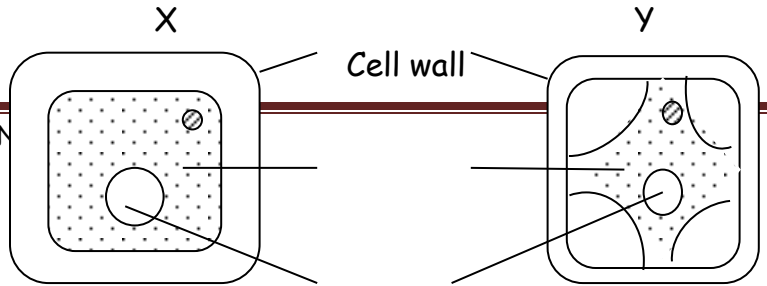
……

……

……

(3 marks)

45. Below are cells X and Y from the epidermis of Bryophyllum. One cell has been placed in a concentrated sugar solution and the other in distilled water



cytoplasm

cell sap

(a) Which cell is in the sugar solution?

…….

……

…….

(1 mark)

(b) What prevents the cell in distilled water from bursting?

…….

……

…….

(2 marks)

(c) Why does the cell sap of Y appear thicker than it normally looks?

…….

……

…….

(1 mark)

(d) How can you show that the changes in the two cells are not permanent?

…….

……

…….

(3 marks)

(e) Briefly explain why a red blood cell bursts when put in distilled water but amoeba does not.

…….

……

……

……

(3 marks)

(4 (a) Describe the structure of a mitochon dria

……

……

……

……

……

(2 marks)

(b) Explain why the mitochondria are able to

(i) divide on their own

……

……

……

1 ½ marks)

(ii) carry out protein synthesis

……

……

……

……

(1 ½ marks)

(c) Describe the structures of the plasma membrane according to the fluid mosaic model

…….

……

(3 marks)

(d) How does the fluid mosaic model differ from the Daniel Davson model?

……

……

……..

(2 marks)

46.(a) Give **three** differences between the structure of glycogen and collagen.

(03 marks)

……

……

……

……

……

……

……

…

(b) Collagen is found in the ligaments which hold bones together at joints. State the properties of collagen that make it suitable for this purpose.

(03 marks)

……

……

……

……

……..

(c) Give **four** features of glycogen that enable it to act as an efficient storage substance in animal cells.

(04 marks)

……
……
……
……
……
……

……

END