NAME: …… RANDOM NO. ……

CANDIDATE NO. …….

UCE MOCK

BIOLOGY

THEORY

553/1

2 ½ HOURS

UGANDA CERTIFICATE OF EDUCATION
MOCK EXAMINATION
UCE BIOLOGY THEORY

553/1

TIME: 2 HOURS 30 MINUTES

INSTRUCTIONS

- *Answer all questions in section A and B*
- *Write the answers to section A in the boxes in the margin of each question*
- *Write answers to section B in the spaces provided*
- *Answer only two questions from section C*
- *Write the answers to section C on the answer sheets provided.*

FOR EXAMINERS USE ONLY

SECTION	MARKS
A	
B 31	
B 32	
B 33	
C	
C	
TOTAL	

1. Which one of the following organisms is an autotroph?
   A. Virus
   B. Euglena
   C. Amoeba
   D. Paramecium

2. Haemolysis will occur when
   A. Red blood cells are placed in distilled water
   B. Plant cells are placed in distilled water
   C. Red blood cells are placed in conc. Sugar solution
   D. Plant cells are placed is conc. sugar solution

3. At compensation point
   A. More oxygen is released due to higher photosynthesis than respiration
   B. More carbon dioxide is released due to higher respiration than photosynthesis
   C. More food is manufactured than what is broken down
   D. Both respiration and photosynthesis occur at the same rate

4. When humans are exposed to cold conditions their
   A. Oxygen consumption increases
   B. Rate of urine formation decreases
   C. Feeling of thirst increases
   D. Metabolic rate decreases

5. Highly developed carnassial teeth are a major adaptation for
   A. Chewing curd
   B. Grasping prey
   C. Shearing flesh
   D. Defence against predators

6. Which pair of blood vessels below contains de-oxygenated blood?
   A. Pulmonary artery and umbilical artery
   B. Pulmonary vein and umbilical vein
   C. Pulmonary vein and umbilical artery
   D. Pulmonary artery and umbilical vein

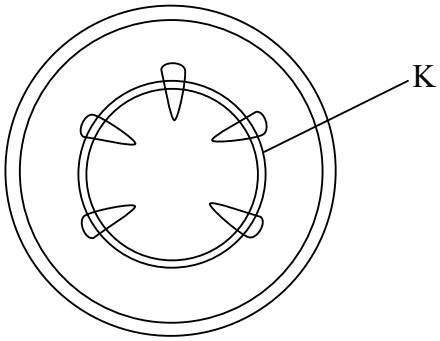
7. For fraternal twins to be born
   A. Two ova are fertilized by two different sperms
   B. One ovum is fertilized by two different sperms
   C. One ovum is fertilized by one sperm then zygote splits
   D. Two ova are fertilized by one sperm

8. Which of the following processes occur together during accommodation
   i) Circular cirlary muscles contract
   ii) Circular ciliary muscles relax
   iii) Radial circliary muscles contract
   iv) Radial ciliary muscles relax
   v) Lens shrinks
   vi) Lens widens

   A. i, iii and vi
   B. ii, iv and v
   C. i, iii and v
   D. ii, iii and vi

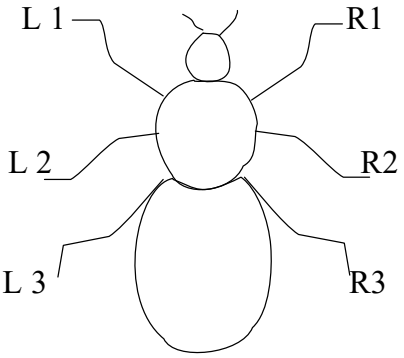
9. For inhaled air to reach the cells of insects, it passes through the following respective organs:
   A. Spiracles, tracheoles, Tracheae
   B. Tracheoles, Tracheae, spiracles
   C. Spiracles, Tracheae, Tracheoles
   D. Tracheae, Tracheoles, spiracles

10. The diagram below show a cross section of a stem.



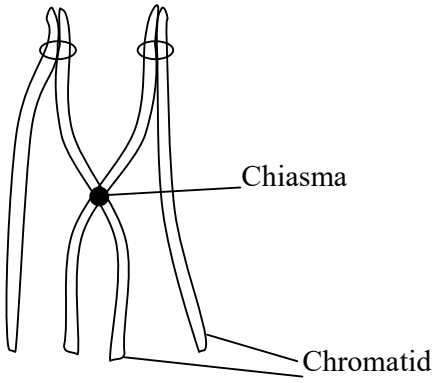
   Part labeled K is responsible for
   A. Transporting sugars
   B. Secondary growth
   C. Transporting water
   D. Protection

11. L1, L2, L3 represent insect legs on the left side while R1, R2 and R3 represent legs on the right. Which one of the following represents the correct set of legs moved together during locomotion



A. L1, L2, R1
B. L1, L3, R2
C. L2, L3,R2
D. L3, L2, R3

12. The stage of cell diversion shown in the diagram is for



A. Maintaining the chromosome number
B. Halving the chromosome number
C. Increasing variability
D. Doubling the chromosome number

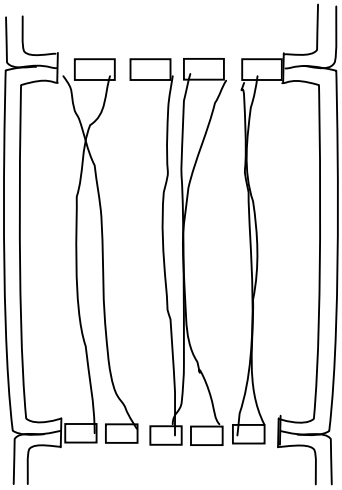
13. The type of skeleton where muscles are attached inside the skeleton is common in
A. Earthworms
B. Birds
C. Mammals
D. Insects

14. Which one of the following soil samples will have the least percentage decrease in mass when heated to red hot?
    A. Clay
    B. Loam
    C. Loam-sand
    D. Sand

15. Which one of the following is an example of detritivores
    A. Plants
    B. Bacteria
    C. Carnivores
    D. Earthworms

16. One advantage of legumes over berries is that legumes
    A. Have few seeds while berries have many seeds
    B. Have large seeds while berries have all seeds
    C. Are fry while berries are succulent
    D. Do not need dispersal agents while berries need agents

17. The type of plant cell shown is modified for



    A. Protection
    B. Photosynthesis
    C. Translocation
    D. Storage

18. Which one f the following is the correct direction of impulses in the central nervous system?
    A. Sensory neurone, synapse, relay neurone, synapse, motor neurone
    B. Motor neurone, synapse, relay neurone, synapse, senory neurone.
    C. Relay neurone, synapse, motor neurone, synapse, sensory neurone
    D. Synapse, motor neurone, synapse, sensory neurone, relay neurone

19. Dioecious codition is an attempt by plants to increase chances of
    A. Self pollination
    B. Pollination by insects
    C. Cross pollination
    D. Pollination by wind

20. Reversal of stomatal rhythm by plants is an adaptation for
    A. Increase in carbon dioxide up take
    B. Decrease in transpiration rate
    C. Increase in photosynthesis
    D. Temperature regulation

21. The following are abiotic factors, which affect population size except
    A. Temperature
    B. Diseases
    C. Humidity
    D. Light

22. Part of the ear concerned with conversion of mechanical sound waves into electrical nerve impulses is the
    A. Organ of corti
    B. Pinna
    C. Vestibular apparatus
    D. Tympanum

23. Failure of development of secondary sexual characteristics in females may be caused by inadequate secretion of
    A. Adrenaline
    B. Testosterone
    C. Oestrogen
    D. Insulin

24. The response to touch by folding of leaves of Mimosa pudica is called
    A. Simple reflex
    B. Nastic
    C. Tropism
    D. Kinesis

25. Which one of the following blood vessels contains the highest concentration of urea?
    A. Heptic vein
    B. Renal vein
    C. Heptatic artery
    D. Renal artery

26. Double fertilization in flowers involve fusion of
    A. One made nucleus with two polar nuclei
    B. One male nucleus with egg nucleus
    C. One male nucleus with synergids
    D. One male nucleus with egg nucleus plus another male nucleus with the polar nuclei.

27. The major purpose of hibernation by animals is to
    A. Regulate the body temperature
    B. Regulate the osmotic pressure
    C. Slow down the breathing
    D. Conserve food reserves

28. When a person catches a disease and recovers, he may gain a type of immunity called
    A. Active
    B. Passive
    C. Artificial
    D. Temporary

29. Counter current flows between blood and water over the fish gills serves the purpose of
    A. Increasing the surface area
    B. Reducing the diffusion distance
    C. Increasing the diffusion gradient
    D. Protecting the gill filaments

30. Which one of the following is expected to be higher in people living at high altitude than those at low altitude? The number of
    A. Thrombocytes
    B. Phagocytes
    C. Erythrocytes
    D. Lymphocytes

SECTION B

31. An experiment was carried out to investigate the effect of smearing jelly on the surfaces of the leaves, on rates of photosynthesis at different light intensities. Results obtained were recorded as below:

Light intensity in (arbitrary units)	0.1	0.2	0.3	0.4	0.5
Rate of Photosynthesis in leaf A whose both surfaces were smeared.	10	14	16	20	20
Rate of Photosynthesis in leaf B whose upper surface was smeared	25	28	32	35	35
Rate of photosynthesis in leaf C whose under surface was smeared	20	21	25	28	28
Rate of Photosynthesis in lead D whose both surfaces were not smeared with jelly	30	35	40	45	45

a) Plot the graphs to show how rate of photosynthesis vary in leaves A, B, C, and D at different light intensities (in arbitrary units) *(10 marks)*

b) How does smearing of jelly affect the rates of photosynthesis in leaves A, B, C, and D?

Leaf A *(1 ½ marks)*

.....

.....

.....

Leaf B *(1 ½ marks)*

.....

.....

.....

Leaf C *(1 ½ marks)*

.....

.....

.....

Leaf D *(1 ½ marks)*

.....

.....

.....

c) i) Give any one reason why the rate of photosynthesis at light intensities of 0.4 and 0.5 are the same? *(1 mark)*

.....

.....

ii) What is the optimum light intensity for photosynthesis in leaves A, B, C, and D?

(1 mark)

.....

.....

d) How does each of the following adaptations influence photosynthetic rates?

i) Numerous chloroplasts *(1 mark)*

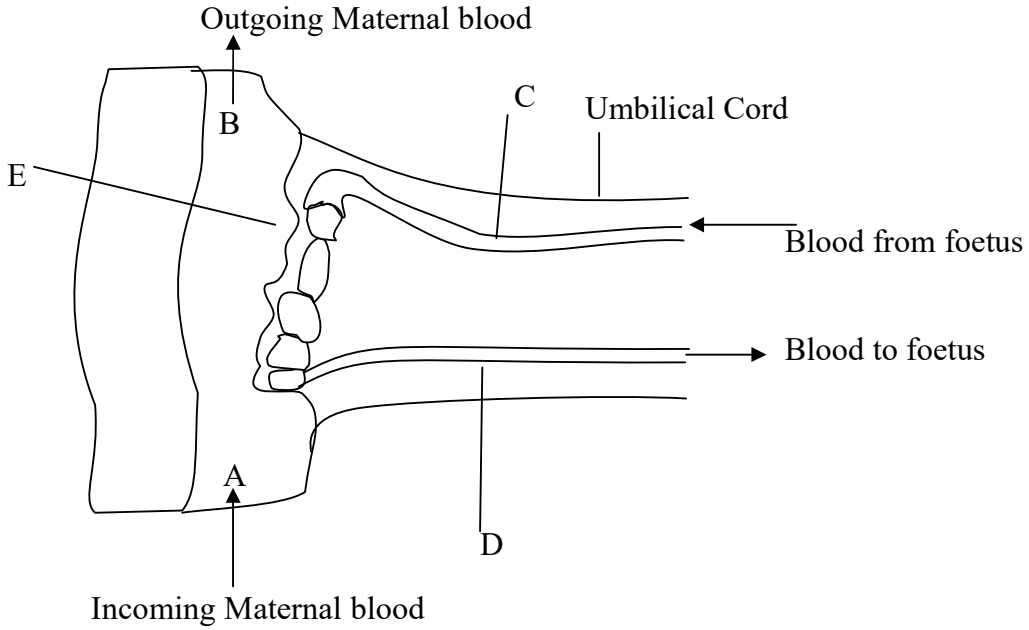
.....

.....

ii) Large intercellular air spaces *(1 mark)*

.....

32. The diagram below shows parts of the human female reproductive system during gestation period.



a) What is gestation period? *(1 mark)*

.....

.....

b) What name is given to the main organ shown? *(1 mark)*

.....

.....

c) Name the parts labeled: *(2 marks)*

C.....

D.....

d) i) State four differences in composition of blood in vessels C and D

.....

.....

.....

.....

ii) Give reasons for the differences in d(i) above. *(1 mark)*

.....

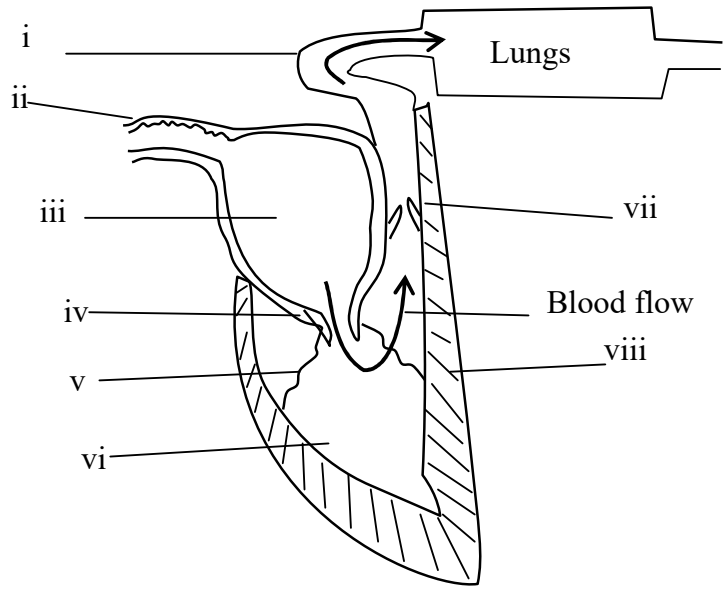
.....

.....

.....

.....

33. The diagram below shows parts of the human circulatory system.



a) Name the labeled parts: (3 marks)

i) …….. iv) ……

ii) ……. v)……

iii) ..... vi) ……

b) State the functions of parts iv, v and viii. (3 marks)

Part iv .....

.....

Part v .....

.....

Part viii .....

.....

c) Explain how part vi carries out its function. (3 marks)

.....

.....

.....

.....

.....

SECTION C

34. a) Distinguish between primary and secondary ecological succession. (2 marks)
    b) Describe process of primary ecological succession. (10 marks)
    c) Outline the ecological importance of decomposers. (3 marks)

35. a) State the importance of gaseous exchange to organisms
    b) Explain why plants lack elaborate respiratory system unlike animals
    c) Describe the mechanism which brings atmospheric oxygen into the cells of the body of an insect

36. a) State the meaning of: (3 marks)
    i) dominant alleles
    ii) co-domiant alleles
    iii) sex-linked genes

    b) During a genetic study, a plant which bears oval shaped seeds was selfed, the seeds obtained when planted gave the following offsprings:
    98 Long seeded plants; 200 oval seeded plants; 99 round seeded plants
    Using suitable symbols, explain how these results arose.
    (12 marks)

37. a) What are tropisms?
    b) State the differences between phototropism and simple reflex action of removal of hand from a hot object.

    c) State the importance of the following responses:
    i) Geotropism
    ii) Phototropism

END