

Name

Centre/Index No.

Signature

**S.4 BIOLOGY 1 553/1
Revision Aug 2014
1 HOURS 15 MINUTES**

Instructions to Candidates.

Answer all the questions in Section A and B.

Answers to section A and B must be written in the spaces provided.

SECTION A

1. Which one of the following structures secretes the follicle stimulating hormone?

- A. Corpus luteum
- B. Endometrium
- C. Graafian follicle
- D. Pituitary gland

2. Which of the following is a class?

- A. Crustacea
- B. Platyhelminthes
- C. Annelida
- D. Monera

3. Some live maggots were put in a glass tubing. Both ends were blocked with paper. The middle part was filled with moist cotton wool. After 20 minutes all the maggots had moved to the cotton wool of because they_____.

- A. show negatively nastic response to moisture.
- B. show positively nastic response to moisture.
- C. show negatively tactic response to moisture.
- D. show positively tactic response to moisture..

4. Musca domestica gets rid of nitrogenous wastes through structures called

- A. Nephridia
- B. tracheoles
- C. Nephrons
- D. Malpighian tubules.

5. The most prominent characteristic feature of a lumbar vertebra is the presence of_____.

- A. A large centrum
- B. Odontoid process
- C. a long neural spine
- D. vertebral arterial canal

6. Which of the following suits an antelope?

- A. Chordata
- B. Nematoda
- C. Annelida
- D. Coelenterata

7. The table below shows the results of an experiment to determine the amount of water lost by a potted plant due to transpiration under different environmental conditions.

Time (Min)	0	5	10	15	20	25	30
Weight of potted plant (g)	500	500	405	300	200	190	185

Under which of the following conditions was the experiment performed between 5 and 20 minutes.?

- A. In a dark room covered with a wet polythene bag.
- B. In a shady, cooled and enclosed place.
- C. In a cold, humid and shaded place.
- D. Outside a classroom during a bright afternoon.

8. Blood grouping is done by adding specimen blood to known samples of serum. A blood sample was added to anti-B serum. There was no clumping. When the sample was added to anti-A serum clumping occurred. What was the blood sample? Blood group_____.

- A. B
- B. A
- C. AB
- D. O

9. Which of the following statements is not true of the gene for lack of a clotting factor in humans?

- A. It is found frequently in males than females.
- B. It does not appear in a female unless it also appeared in the paternal parent.
- C. It rarely appears in both father and son, then only if the maternal parent is heterozygous
- D. It is found more frequently in the female than in the male.

10. Which of the following secretions contains an enzyme that coagulates milk?

- A. Gastric juice
- B. Succus entericus
- C. Pancreatic juice
- D. Saliva

11. The table below shows the surface area and volume of 4 animals. Which one of them would most need a breathing system?

Animal	Surface area (Cm ²)	Volume (Cm ³)
A.	1154	1127
B.	72	24
C.	30	50
D.	10	4

12. Which one of the following would you expect to increase at successive levels of a food chain?

- A. Total number of consumers.
- B. Total energy content.
- C. Concentration of pollutants in organisms.
- D. Biomass of organisms.

- 13 .Some xerophytes have solved the problem of water loss physiologically by
- A. reducing the number of stomata.
 - B. possession of long roots which absorb water from deep down the soil.
 - C. possession of hairy epidermis.
 - D. opening the stomata at night and closing them by the day.

14. A transverse section of unnamed plant when examined under a microscope was found to have an epidermis with a very thick cuticle.The unnamed plant is most likely _____plant.

- A. an aquatic
- B. a desert.
- C. tropical rain forest
- D. savannah grassland.

15. An athlete has just finished a race.'oxygen debt' refers to

- A. The amount of oxygen originally present in the muscles of the athlete before the race.
- B. The total amount of oxygen the athlete requires to restore the breathing rate to normal.
- C. The amount of oxygen taken in after the race and used to complete the combustion of some of the lactic acid.
- D. The amount of oxygen required after the race to convert excess lactic acid to glycogen in the liver.

16. Which change occurs in the cell and what causes the change?

	Change	Cause
A	Cell becomes more flaccid	Solution diffuses out of the cell
B	Cell becomes more turgid	Water diffuses into the cell
C	Cell becomes more turgid	Solution diffuses into the cell
D	Cell becomes more turgid	Solution diffuses into the cell

17. In which region of the mammalian kidney does glomeruli occur?

- A.Cortex
- B.Medulla
- C.Pelvis
- D.Pyramid

18. If a woman who is heterozygous for colourblindness marries a normal man, which of the following will be true of their offspring?

- A. All of their sons will be colourblind.
- B. All of their daughters will be carriers of colourblindness.
- C. One half of their children of either sex may receive the abnormal allele.
- D. All of their children will be carriers.

19. In the classification of organisms which of the following is the correct hierarchy of the taxonomic groups?

- A. family genus kingdom class order phylum
- B. family genus order phylum kingdom class
- C. genus family order class phylum kingdom
- D. kingdom genus phylum order family class

20. Which of the following organisms would have their growth rate increased by a rise in levels of atmospheric carbon dioxide?

- A. bananas
- B. antelopes.
- C. cheetahs.
- D. mushrooms.

21. Deep in the Pacific Ocean, in total darkness, there is volcanic activity and a large amount of hydrogen sulphide is produced. Bacteria use the hydrogen sulphide to make food and shrimps as well as worms feed on the bacteria. To which trophic levels do the organisms in this ecosystem belong?

	Hydrogen sulphide bacteria	Shrimps and worms
A	Decomposers	Primary Consumers
B	Decomposers	Secondary consumers
C	Primary consumers	Secondary consumers
D	Primary producers	Primary Consumers

22. Which hormones promote the processes shown?

	Conversion of glycogen to glucose in liver cells.	Respiration of glucose in liver cells.	Uptake of glucose by muscle cells.
A	Insulin	Glucagon	Glucagon
B	Insulin	Glucagon	Insulin
C	Glucagon	Insulin	Glucagon
D	Glucagon	Insulin	Insulin

Time(weeks)	0	1	2	3	4	5	6
Dry weight(g)	150	100	75	50	80	160	300

Which one of the following would explain the change taking place during the first weeks?

- A. The soil is dry and seeds are losing water too quickly.
- B. The cotyledons were eaten away by the soil organisms.
- C. The seedlings are using some of their food substances for respiration.
- D. The rate of respiration is lower than that of photosynthesis.

29. The type of soil with large air spaces and low capillarity is _____

- A. Sand.
- B. Clay.
- C. Silt.
- D. Loam.

30. The following are features found in birds

- i) Light bones.
- ii) Webbed feet.
- iii) Scales on the legs.
- iv) Streamlined body.

Which of the features are adaptations for flight?

- A. i) and ii)
- B. ii) and iii)
- C. iii) and iv)
- D. i) and iv)

SECTION B:

Answer all questions in this section. Answers must be written in the spaces provided.

31. The table below shows the changes in the dry weight of seedlings during the first 6 weeks of germination.

Time(weeks)	0	1	2	3	4	5	6
Dry weight(g)	75	50	38	25	40	80	150

A i) Plot this information as a graph in the space below.(8 marks)

ii) With reference to the graph describe the change in dry weight over the period of 6 weeks. (2 marks)

iii) Explain the change in dry weight.(2 marks)

- iv) On the same graph draw another graph if fresh weight was considered. Label the two graphs to differentiate them. (1 mark).
- v) Explain why the graph appears as it is shown. (1 mark)

b) Why is it advantageous to measure growth of an organism using fresh weight instead of dry weight? (1 mark)

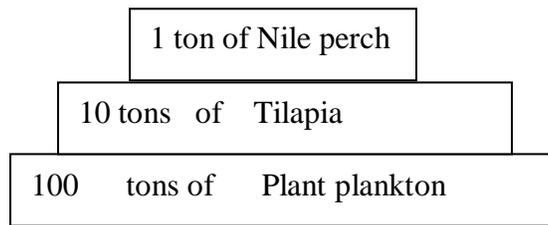
c) Why is it disadvantageous to measure growth of an organism using fresh weight instead of dry weight? (1 mark)

d) What other two methods apart from use of weight can be used to measure the growth of a plant? (1 mark)

e) i) Suggest three factors that can affect the growth of a plant. (1 ½ Marks)

ii) For each of the factors mentioned, state one of its roles in the growth of a plant. (1 ½ Marks)

32.a) The diagram below shows a fresh water food pyramid. Use it to answer the following questions.



i) What percentage of the food available for each organism is converted into the body weight? Show your working.(3 marks)

ii) In what way could energy be lost from this system? .(1 mark)

- iii) Give one way in which energy could be added to this system.(1 mark)
 - iv) What would you call the method of feeding in Tilapia? .(1 mark)
 - v) Derive a possible food chain in this ecosystem.(2 marks)
 - vi) Suggest an ecological term to describe the predator of the Nile perch. .(1 mark)
- b) Why are decomposers important in an ecosystem. .(1 mark)