FACULTY OF SCIENCE

BOTANY AND PLANT BIOTECHNOLOGY DEPARTMENT

LS3BFET/ LSFT0B3

LIFE SCIENCE 3B FET

APK CAMPUS

NOVEMBER EXAM

19 NOVEMBER 2016

DATE:	**19 NOVEMBER 2016**
SESSION:	**8H30-11H30**
ASSESSOR:	**MS J. WILLIAMSON**
INTERNAL MODERATOR:	**DR. A. NEL**
EXTERNAL MODERATOR:	**PROF. J. DE BEER**
DURATION/ TYD:	**3 HOURS**
TOTAL MARKS:	**145**

NUMBER OF PAGES: 9 PAGES

Please read the following instructions carefully:

1. Answer all the questions in the question paper.
2. Answer ALL of the questions in the test book.
3. Work neatly
4. Read your questions carefully.
5. Good Luck.

QUESTION 1 **[15]**

Choose the alternative that best completes the statement or answers the question. Only write down the correct letter next to the question number in your answer book.

1.1 Integration of simple responses to certain stimuli, such as the patellar reflex, is accomplished by which of the following?

A) Spinal cord
B) Hypothalamus
C) Corpus callosum
D) Cerebellum
E) Medulla

1.2 Which part of the vertebrate nervous system is most involved in preparation for the fight-or-flight response?

A) Sympathetic
B) Somatic
C) Central
D) Visceral
E) Parasympathetic

1.3 Which system controls smooth and cardiac muscles of the digestive, cardiovascular, and excretory systems?

A) Central nervous system
B) Peripheral nervous system
C) Autonomic nervous system
D) Parasympathetic nervous system
E) Sympathetic nervous system

1.4 Which of the following is an incorrect statement about the vertebrate eye?

A) The vitreous humour regulates the amount of light entering the pupil.
B) The transparent cornea is an extension of the sclera.
C) The fovea is the centre of the visual field and contains only cones.
D) The ciliary muscle functions in accommodation.

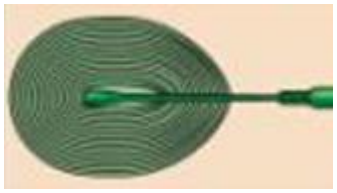
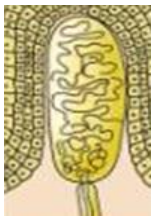
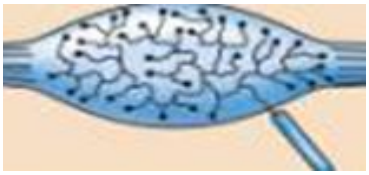
E) The retina lies just inside the choroid and contains the photoreceptor cells.

1.5 Which of the following statements about the eye is correct?

1. The cornea bends light rays.
2. The retina contains blood vessels.
3. The ciliary muscles change the pupil diameter.
4. The cones respond to bright light.

A) 1, 2 and 3.
B) B.) 1, 2 and 4.
C) 2, 3 and 4.
D) Only 2 and 4.
E) Only 1 and 4

1.6 Which one (1) of the following mechanoreceptors is sensitive to changes in texture and slow vibrations?

A.  B.  C. 

C.  D. 

1.7 The structure of the ear responsible for protection against insect invasion.

A) Ear hairs
B) Cerumen glands
C) Ampulla
D) Otoliths
E) Pinnae

1.8 The structure in the nose which keeps the inside moist.

A) Bowman gland
B) Otoliths
C) Olfactory cells
D) Cochlea
E) Mucus

1.9 The function of the basilar membrane is to _____

A) transmit vibrations from the tympanic membrane to the oval window.
B) vibrate up and down in response to the fluid pressure waves in the vestibular canal.
C) vibrate in response to moving air reaching the outer ear.
D) create pressure waves in the perilymph (fluid inside the cochlea).

1.10 Which of the following statements about diabetes mellitus is correct?

A) It is characterized by large volumes of dilute urine.
B) It results when the body produces too much glucagon.
C) Type II diabetes requires insulin replacement therapy.
D) Type II diabetes is an autoimmune disorder.
E) Type I diabetes features high blood glucose levels due to insufficient insulin production.

1.11 Which hormone is correctly paired with its function?

A) Parathyroid hormone – lowers blood calcium
B) Glucocorticoids – decrease blood glucose
C) Norepinephrine – reduce heart rate
D) Melatonin – promotes sleep
E) Aldosterone – increases sodium excretion by kidneys

1.12 Which of the following is secreted by the pineal gland?

A) Androgens
B) Estrogens

C) Progestins
D) Catecholamines
E) Melatonin

1.13 Choose the incorrect statement regarding phototropism.

A) It is caused by a chemical signal.
B) One (1) chemical involved is auxin.
C) Auxin causes a growth increase on one side of the stem.
D) Auxin causes a decrease in growth on the side of the stem exposed to light.
E) Removing the apical meristem prevents phototropism.

1.14 Which of the following are defences that some plants use against herbivory?

A) Production of the unusual amino acid canavanine
B) Release of volatile compounds that attract parasitoid wasps
C) Association of plant tissues with mycorrhizae
D) A and B only
E) A, B, and C

1.15 Plants that have their flowering inhibited by being exposed to bright lights at night are __

A) day-neutral plants.
B) short-night plants.
C) devoid of phytochrome.
D) short-day plants.
E) long-day plants.

QUESTION 2 **[15]**

Give the correct biological term for each of the following definitions. Only write down the correct term next to the appropriate question number in your answer book.

2.1 A brain disorder characterized by manic and depressive phases.

2.2 A type of chemical that modifies a neuron's response to a neurotransmitter.

2.3 Short nerve processes that transports impulses towards the cell body of a neuron from other neurons or from the sensory receptors.

2.4 A person who needs to wear glasses with a convex lens, to increase the bending of light rays so that the image can be focused on the retina, has this disorder.

2.5 The mechanoreceptor sensitive to sustained touch and pressure.

2.6 The part of the cerebrum which integrates umami.

2.7 and 2.8 The enlarged areas of the vestibular organ (2).

2.9 The receptor cells of smell.

2.10 ACTH stimulates the adrenal cortex to produce this chemical during stress.

2.11 The part of the pituitary gland which produces and secretes ADH and Oxytocin (Give the Latin name of the structure).

2.12 The hormone that corrects a low blood calcium level.

2.13 Chemical signals that coordinate different parts of an organism.

2.14 A terminal bud's ability to suppress development of axillary buds.

2.15 The protein chemical responsible for seed germination.

QUESTION 3 **[19]**

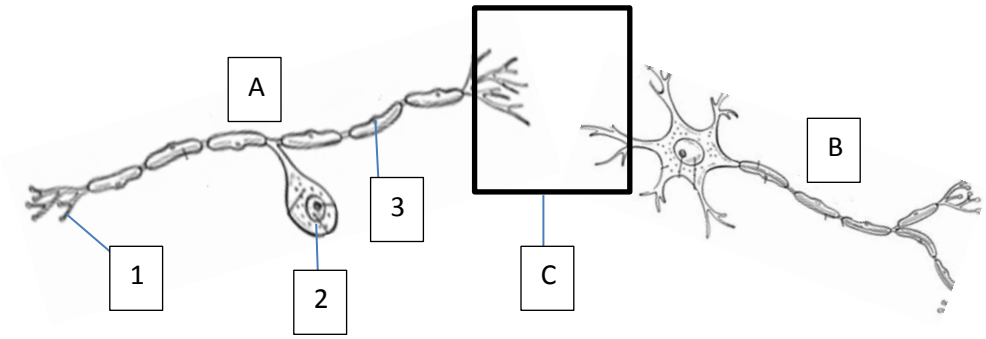
3.1 Distinguish between each of the following using a table:

3.1.1 Sensory neuron and Motor neuron. (4 x ½ = 2)

3.1.2 Sympathetic and Parasympathetic nerve systems. (2)

3.1.3 Nerve system of a Cnidarian and Nerve system of a Platyhelminthes. (2)

3.2 Study the following diagram and answer the questions that follow.



3.2.1 Give suitable detailed labels for A, B, C, 1, 2 and 3. (6)

3.2.2 Briefly explain the conduction of an impulse across structure 3. (14 x ½ = 7)

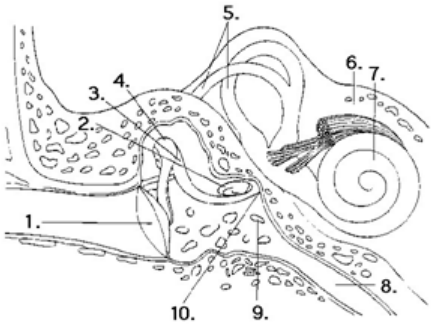
QUESTION 4 **[19]**

4.1. Draw a detailed diagram to show the internal structure of the human eye. (16 x ½ = 8)

4.2 Distinguish between the two (2) types of photoreceptors found in the human eye. (11)

QUESTION 5 **[19]**

5.1 Study the diagram below and answer the questions that follow.



5.1.1 Give the letter and name of the structures (10 X ½ = 5)

a. Involved in equalizing the pressure between the ear and the atmosphere.

b. Involved in equilibrium.

c. Involved in transmitting vibrations to the oval window.

d. Where the receptor cells of hearing is found.

5.1.2 Distinguish between the functions of structures 1 and 2 (Include the names of structures 1 and 2). (4)

5.1.3 Name, draw and label the receptor cell found in the wider area of structure 5. (7)

5.2 How does the middle ear assist to prevent any high pitch sounds damaging the inner ear and to enhance soft sounds? (3)

QUESTION 6 **[19]**

Name and discuss the only gland that is both an endo- and exocrine gland in the human body.

(19)

QUESTION 7 **[19]**

7.1 How do Cytokinins retard the aging of some plant organs? (3)

7.2 What is noted during autumn months with regard to some trees and which plant hormone is responsible for this occurrence? Why does this happen during autumn in some trees? (3)

7.3 Which processes are controlled by blue-light-photoreceptors? (3 X ½ = 1½)

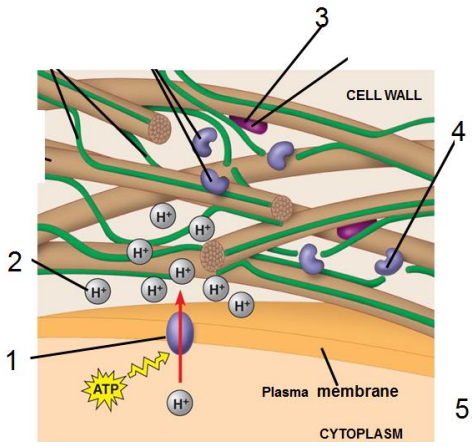
7.4 Give a brief definition of the following: (4)

7.4.1 Circadian rhythms

7.4.2 Photoperiod

7.5 Why do plants use defence systems? (3 X ½ = 1½)

7.6 Study the diagram below which represents the role of a specific plant hormone in cell elongation and give the diagram a title and briefly describe what happens at each number. (6)



5. (Result)

6. (Title)

QUESTION 8 **[20]**

8.1 Name the chosen theme for your Unit 6. (2)

8.2 What are the learning outcomes of your Unit 6? (What should the students know after completion of the unit?) (10)

8.3 Explain the aim and materials and methods for the practical you have designed for your Unit 6. (8)

----------oOo----------