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NAME:…….. **STREAM**……

SENIOR FOUR

553/1

BIOLOGY

PAPER 1

EXAM 9

FOR CONSULTATION CALL 0776802709

$2^{1}/_{2}$ HOURS

Instructions

1. Answer all questions in section **A** and **B**, plus two questions in section **C**.
2. The answers for section **A** should be written in the table below. Your work will not be marked unless the answers are written in the table.
3. Answers to section B should be written in the spaces provided.
4. Answers for section C should be written in the separate answer sheets provided.

Question	Marks
A	
31	
32	
33	
34	

SECTION A

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**

SECTION A.

1. Which of these diseases is caused by hormonal deficiency?
   A. rickets
   B. diabetes
   C. scurvy
   D. poliomyelitis

B

Diabetes is caused by lack of insulin

2. Which one of the following plant food storage organs contains most food substances?
   A. stem tubers
   B. root tubers
   C. fruits
   D. seed

D

Seeds contain most of the food substances to nourish the growing embryo during germination

3. A person with blood group O is said to be a universal donor because
   A. lacks antibodies in the serum
   B. has both the antigens and antibodies in his blood.
   C. has only antigen a in his red blood cell.
   D. lacks antigen in his red blood cells.

D

4. When a semi permeable membrane is placed between a weak and a strong aqueous solutions, the molecules of water move across it, until equilibrium is established. Which one of these statements below illustrates this situation?
   A. the contents of human small intestines and neighboring blood capillaries
   B. entry of water from soil to root hairs of a plant.
   C. the removal of excess water from the kidney.
   D. the collection of sweat from blood vessels to the skin surface.

B

5. Which one of the following is a function of thyroxin?
   A. controls water re-absorption in the body.
   B. controls basic metabolic rate in vertebrates
   C. regulates activities of other endocrine glands.
   D. controls the functioning of the thyroid glands.

B

6. A medium of Low pH stops the action of
   A. pepsin
   B. lipase
   C. ptyalin
   D. maltase

C

7. A vertebra has a short spine, a neural canal and a vertebral arterial canal. From this description, the vertebra belongs to
   A. cervical region
   B. thoracic region
   C. lumbar region
   D. caudal region

A

8. Which one of the following is common to respiration and photosynthesis.

A. Energy is released
B. Both occur in all living cells.
C. Food oxidation is common to both.
D. Oxygen, carbon dioxide and water are involved.

D

9. Which one of the following organisms does not use blood to carry oxygen within its body?
A. fish
B. bee
C. snake
D. an earth worm

B

In the bee oxygen reaches the body through the tracheal system

10. The path followed by impulses during a reflex action are:
muscle

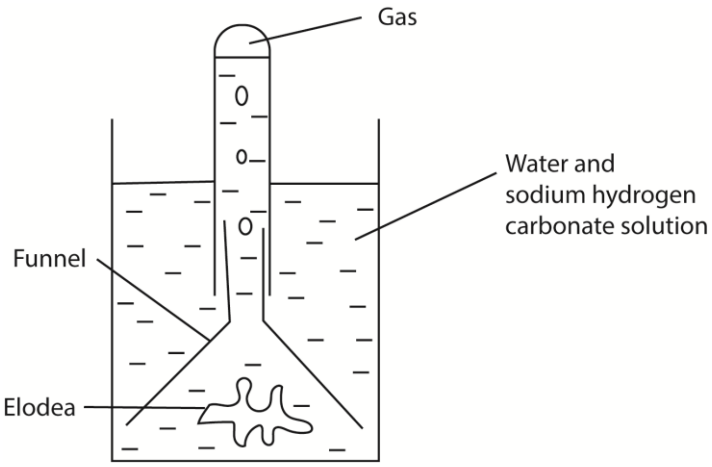
i. muscle
ii. sensory neurone
iii. sense organ.
iv. association neurone
v. motor neurone

The correct order followed by impulses is

C

A. (iii), (iv), (ii), (v), (i)
B. (i), (ii), (iv), (ii), (iii)
C. (iii), (ii), (iv), (v), (i)
D. (ii), (iii), (iv), (v), (i)

11. Figure 1 shows the diagram of the apparatus that can be used to collect the gas evolved in photosynthesis.



Which one of the following would produce the largest volume of the gas in a given time?

A. increasing light intensity
B. increasing the temperature
C. increasing the concentration of sodium hydrogen carbonate.
D. increasing both light intensity and the concentration of sodium hydrogen carbonate.

D

12. Which one of the following glands secretes growth hormone in mammals?
A. pancreas

B. pituitary gland **B**
C. adrenal gland
D. gonads

13. Which one of the following is not a difference between plant cell and animal cell?
    A. animal cell contains small vacuoles whereas plant cells usually have one or two large vacuoles.
    B. animal cells have cell membrane only whereas plant cell have cell walls only.
    C. animal cells are usually flaccid whereas plant cell are usually turgid.
    D. animal cells never contain chlorophyll whereas plant cells do. **C**

14. Which one of the following types of bacteria causes the conversion of ammonia into nitrates?
    A. nitrifying bacteria
    B. denitrifying
    C. putrefying bacteria **A**
    D. Nitrogen fixing bacteria

15. Which one of the following types of processes is not linked with transpiration.
    A. Absorption of water by roots
    B. transportation of sugars **B**
    C. cooling of leaves
    D. provision of mechanical support.

16. Which one of the following is not an example of excretion?
    A. a man sweating
    B. a tree dropping its leaves
    C. a dog salivating **C**
    D. a goat exhaling

17. Secondary thickening in flowering plants is brought about by expansion of the
    A. phloem cells.
    B. cambium cells.
    C. xylem cells **B**
    D. cortex cells

18. A tendon is a
    A. tissue joining bone to muscle
    B. tissue joining bone to bone **A**
    C. tissue joining muscle to muscle.
    D. point where two bones meet.

19. In vertebrates the joint between axis and atlas vertebrae is known as
    A. ball and socket joint.
    B. hinge joint **A**
    C. pivot joint
    D. gliding joint.

20. Which one of the following is the best description of respiration?
    A. breathing in oxygen and breathing out carbon dioxide
    B. absorption of oxygen in the alveoli **C**
    C. release of energy in the cell.

D. gaseous exchange

21. The addition of humus to a sandy soil will
    A. decrease the capillarity of the soil.
    B. improve the water retention of the soil.
    C. increase the aeration of the soil.
    D. decrease its mineral content.

C

22. Antigens stimulate the production of
    A. antibodies
    B. antitoxins
    C. leucocytes
    D. lysines

A

23. A knee jerk is a
    A. conditioned reflex action
    B. reflex action
    C. voluntary action
    D. taxis action

B

24. The hormone that is responsible for the conversion of glycogen to glucose in the liver is
    A. secretin
    B. thyroid
    C. adrenaline
    D. insulin

C

25. In one day old tadpoles, gaseous exchange is performed by
    A. lung
    B. external gills
    C. internal gills
    D. skin of the tail

B

26. From which of the following regions of the body would you find vertebrae with less developed centra?
    A. thoracic
    B. lumbar
    C. cervical
    D. sacral

D

27. Which one of the following types of farming helps in maintaining soil fertility?
    A. crop rotation
    B. bush fallowing
    C. monoculture
    D. mixed farming

D

28. Which one of the following groups of animals posses an open circulatory system?
    A. amphibian
    B. insects
    C. mammals
    D. fish

B

29. Which one of the following monosaccharide is a common component of sucrose, starch and glycogen?
    A. fructose
    B. galactose
    C. glucose
    D. mannose

C

30. Blockage of the bile duct would impair the digestion of
    A. proteins
    B. cellulose
    C. starch
    D. fats

D

SECTION B

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

31. Complete the table below by stating one function and one effect of deficiency in flowering plants for each of the listed element.

ELEMENT	FUNCTION	EFFECT OF DEFICIENCY
Nitrogen	Nitrogen is required by plants to produce amino acids, proteins, and DNA. Nitrogen is necessary because it is a component of chlorophyll	stunted growth i.e., general pale yellowish-green plant with slow growth
Phosphorous	Phosphorus promotes early root growth, winter hardiness, and seed formation, stimulates tillering, and increases water use efficiency.	• Leaves darken becoming gray, blue or dark green • Leaves become shiny with yellow areas • Leaves thicken becoming stiff and dry • Sometimes the leaves turn purple or red
magnesium	In making chlorophyll	**Yellowing between the leaf veins, sometimes with reddish brown tints and early leaf fall**

(b). Name the symptoms caused by the deficiency of each of the following elements in the diet of man.

i. Iodine

goiter

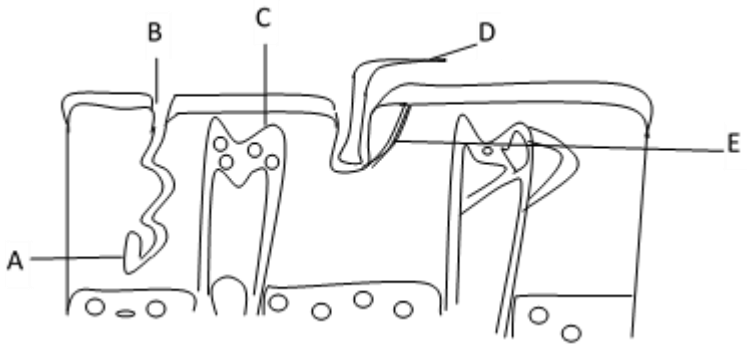
ii. Calcium

- Rickets in babies

- A person with a calcium deficiency may experience: **muscle aches, cramps, and spasms**. pain in the thighs and arms when walking or moving. numbness and tingling in the hands, arms, feet, and legs, as well as around the mouth.

iii. Iron
Anemia

32. Figure below shows a longitudinal section of a human skin.



(a). Name the parts labeled A to E
A sweat gland

B sweat pore

C superficial blood capillaries

D hair

E Erector pili muscle

(b). State the function of each of the parts labeled A, C, D and E

A produce sweat

C: dilate when the body is hot and blood flow to the surface is increases leading increased heat loss contract when the body feel cold diverting blood away from the skin surface

D: raise when the body feels cold, air trapped between the hairs insulates the body against heat loss

E : contracts to raise the hair and relaxes to lower the hair

(c). Using any one observable feature on the diagram, suggest the type of temperature condition the skin is responding to. State the observable feature as a reason for your answer.

Temperature condition

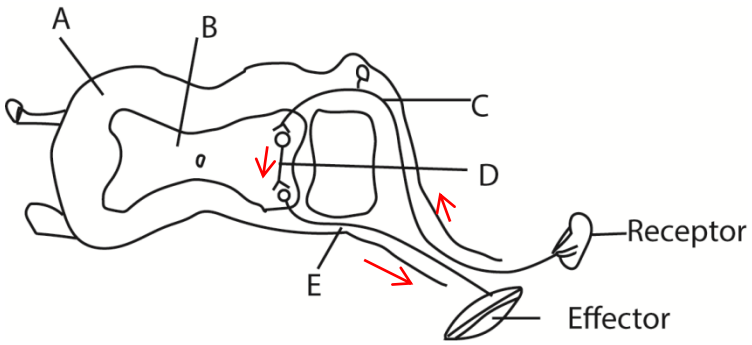
hot

Observable feature

- Hair is lower

- Superficial capillaries dilated

33. Study figure below and answer the questions that follow.



(a). Name the parts labeled A to E on the diagram.

A – white matter

B - grey matter

C – sensory neuron

D- relay neuron

E- motor neuron

(b). By means of an arrow show the direction of impulse propagation in the diagram above

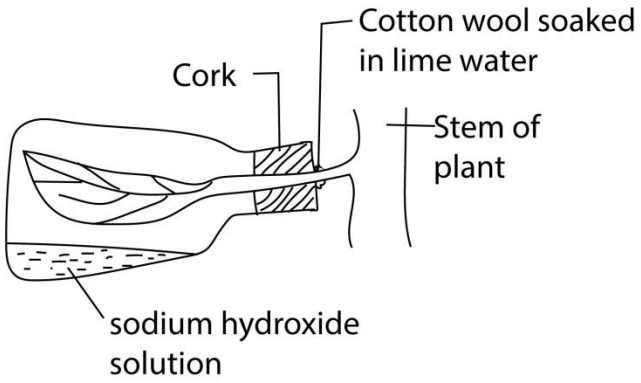
(c). (i) What meant by the term accommodation of an eye

Is the ability of the eye to see near and far objects

(ii). Explain how eye is able to see a near object.

To see near objects, the ciliary muscle contract, releases the tension on the lens allowing it to adopt a more spherical shape. The lens then refracts light strongly.

34. The figure below is an experiment set up to investigate the condition for photosynthesis. The plant is in light but had previously been kept in the dark overnight.



(a) Which condition is being investigated?(01mark)
Necessity of carbon dioxide for photosynthesis
(b) why
(i) It was necessary to keep the plant in the dark overnight? (1mark)
To remove starch from the leaves
(ii) Is left attached to the plant? (01mark)

To obtain water
(c) What is the purpose of sodium hydroxide in the flask? (01mark)
To absorb carbon dioxide from the air
(d) How would you test for starch after some time? (04marks)

- The leaf is boiled in hot water to kill the protoplasm
- The boiled leaf is placed in boiling alcohol to remove chlorophyll
- The leaf without chlorophyll is placed on a white tile and a drop of iodine added
- After a few minutes, the parts of the leaf that contain starch turn the iodine from brown to blue/black.

SECTION C

Attempt only two questions of your choice from this section.

35 (a). What is meant by tissue respiration?

This is the oxidation of organic substance to liberate energy in the body

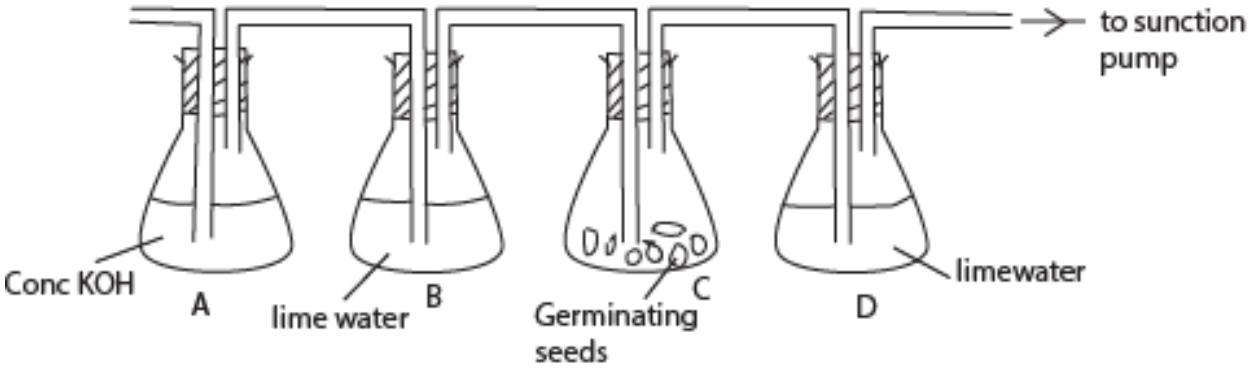
.(b). Explain why tissue respiration is an important process.

Provides energy for cellular reactions, muscle contraction, movements

(c). Describe an experiment to show that germinating seeds liberate carbon dioxide.

An experiment to show that germinating seeds liberate carbon dioxide.

Set up

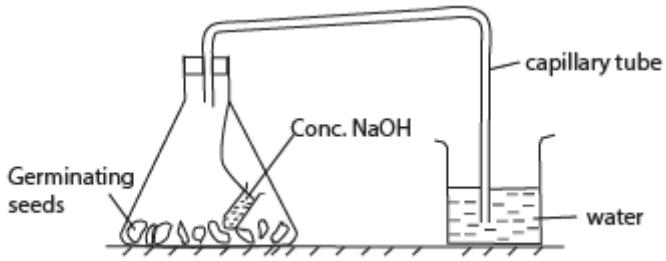


Air is drawn over the germinating seeds using a suction pump for some time.

Observation
Lime water in conical flask D turns milk while that in in flask B does not because carbon dioxide was removed by potassium hydroxide.
Conclusion
Carbon dioxide is produced by germinating seeds.

Alternatively

Set up



The experiment is allowed to stand for some time

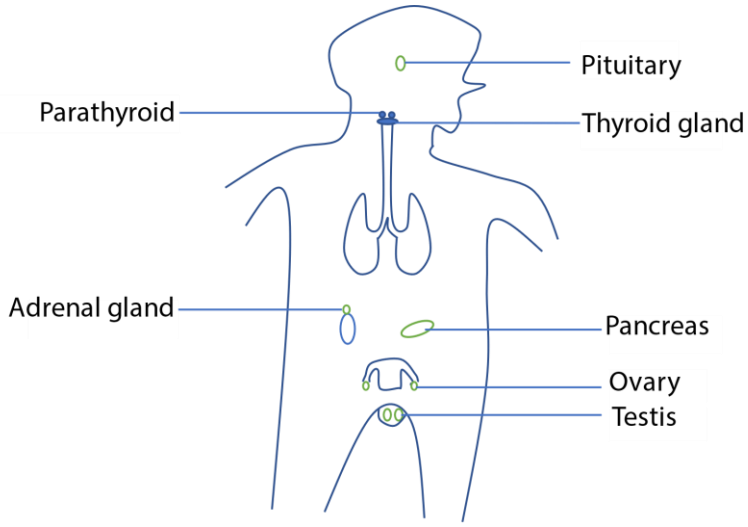
Observations

Water rises in the capillary tube because seeds use up oxygen during respiration and carbon dioxide produced is absorbed by sodium hydroxide solution

36(a). What is an endocrine gland? (2 marks)

Endocrine glands ductless glands that **release hormones into the bloodstream**

(b). Draw and label a diagram to show the location of the endocrine glands in the human body?(7MKS)



(c). Outline the role of the master gland in the body. (6 MKS)

Pituitary gland produce a number of hormones

Hormone produced	Role of hormones produced
Thyroid stimulating hormone	Causes the thyroid gland to secrete thyroxine
Adreno -corticotrophin (ACTH)	Cause adrenal cortex to secrete adrenal cortical hormones
Growth hormones	Stimulate growth
prolactin	Causes mammary gland to secrete milk
Follicle stimulating hormone	Controls testes and ovary
Luteinizing hormone	Controls testes and ovaries
Antidiuretic hormone (ADH)	Causes reabsorption of water in kidney
oxytocin	Causes contraction of uterus at birth

37(a). What is transpiration?

Transpiration is loss of water vapour from the plant especially leaves

(b).State the environmental factors that affect the rate of transpiration.

Factors affecting the rate of evaporation

(i) Temperature
The higher the temperature, the higher the rate of water loss because high temperature provides heat of evaporation.

(ii) Wind: - gentle wind increases the rate of evaporation because it blows away water vapour around the stomata which promotes water loss
- Strong wind reduces the rate of transpiration because it causes the stomata to close.

(iii)Humidity: this is the amount of water vapour in air. High humidity lowers the rate of evaporation and thus transpiration.

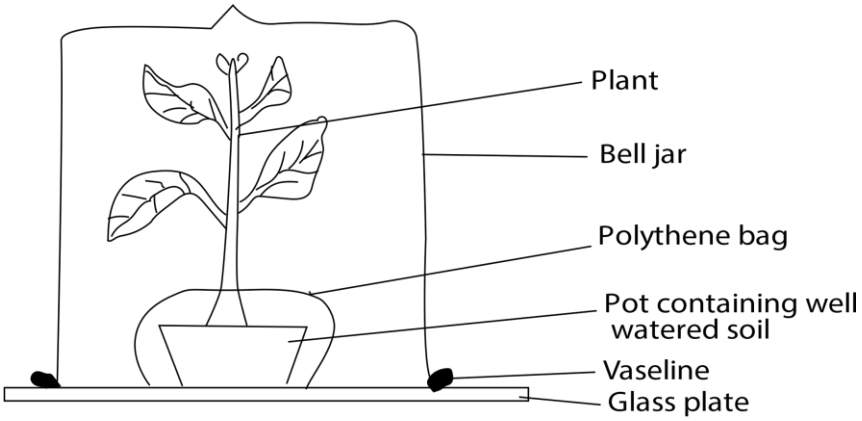
(iv)Light: light increases the rate of evaporation because it causes the stomata to open.

Internal factors

1. Number of stomata: the higher the number of stomata the higher the rate of loss of water

(c) Describe an experiment to show that a plant transpires.

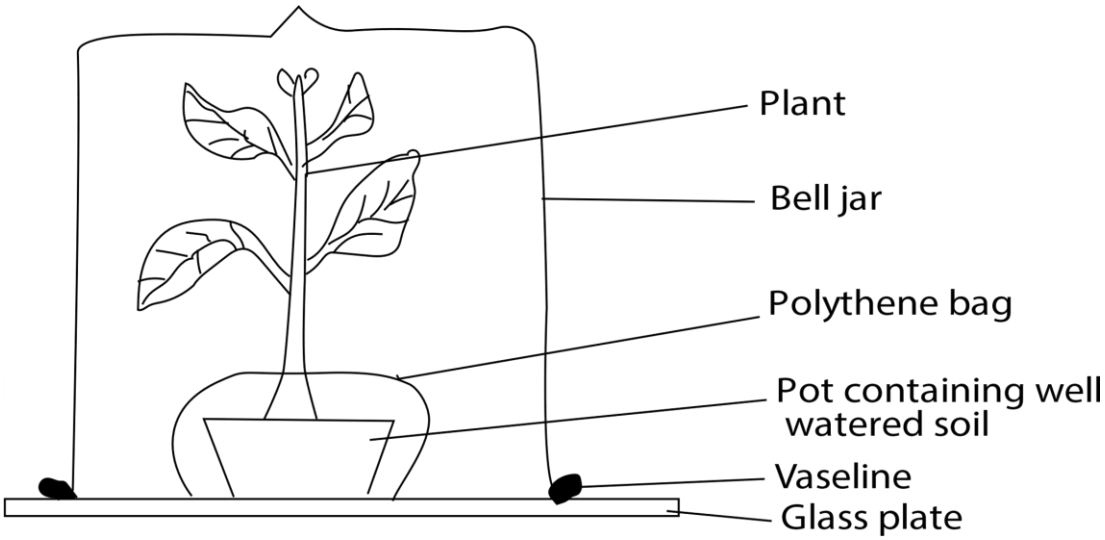
Setup



Potted plant enclosed in a bell jar. Vaseline prevents escape or entry of water vapour and a polythene bag prevent evaporation from the soil

Observation

After sometime water droplets are seen on the walls of bell jar due to transpiration from the plant.



38. Give the importance to the plants of each of the components that make up a fertile soil.

Soil components and their uses

Soil component	Use
Air	Oxygen is particularly required for respiration of micro organism and plant roots; decomposition of organic matter, germination of seed, root hair formation and growth and water absorption. Nitrogen may be fixed by microorganisms into nitrates to be used by plants
Water	- As a source of water and dissolved mineral salt in plant. - Promotes seed germination - Excess water (water logging) slows down water absorption (by lowering the respiration of plant roots since it displaced air from the soil) and decay. - Water softens soil for easy root penetration
soil organism	(i) Microorganisms such as bacteria and fungi. - Promote germination by breaking seed coats - Fix nitrogen in the soil - Decompose and recycle or organic matter (ii) Macro organism such as rodent, termite and worms. - Turn the soil and improve aeration and drainage - Promote decay by breaking big pieces into small pieces - When they die they decay and add humus to the soil
Organic matter	Humus improves the water retention in the soil and therefore the soils containing humus will resist leaching.
Dissolved mineral salts	Source of mineral nutrients to the plants
Insoluble inorganic matter	Support the plant to stand upright

END