GRADE 9 INTEGRATED SCIENCE PAPER 1

SECTION A: MULTIPLE CHOICE QUESTIONS (30 MARKS)

Choose the correct answer and write the letter representing your answer.

1. To find out whether chlorophyll is necessary for photosynthesis, Grade 9 learners tested a variegated leaf using iodine solution. Which observation would most likely be made on the yellow part of the leaf?

A. Blue-black colour B. Yellow colour
C. Brown colour D. Green colour

2.Identify the abiotic component of the environment.

A. Plants B. Human being
C. Goat D. Salinity

3.In which mode of nutrition do two organisms of different species benefit from each other?

A. Parasitism
B. Symbiosis
C. Saprophytism
D. Holozoic

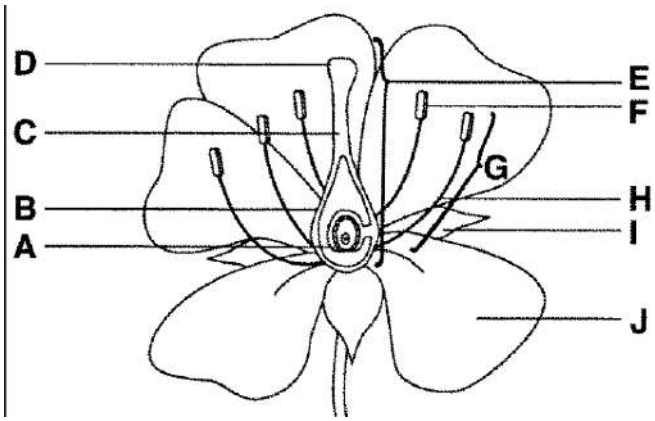
4. A farmer growing maize and beans notices that the crops compete for water and soil nutrients. This type of competition is:

A. Intraspecific
B. Interspecific
C. Mutualism
D. Commensalism

5. Which of the following parts forms part of the carpel in a flower?

A. Anther B. Style
C. Filament D. Petal

6. Study the diagram provided by your teacher.



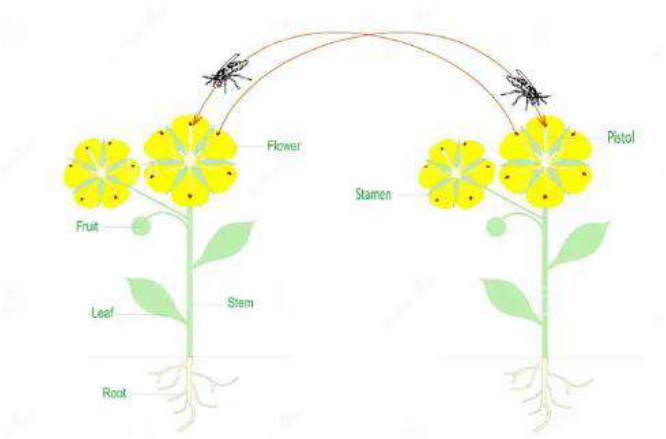
Identify the part labelled **C**.

A. Ovule B. fillament
C. Stigma D. style

7. Name the part labelled **B**.

A. Style B. Stigma
C. Ovary D. Pollen tube

8. The process illustrated in the diagram represents:

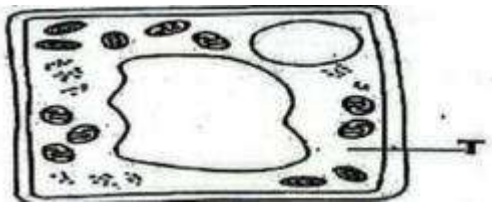


A. cross Pollination
B. Fertilization
C. Germination
D. self pollination

9. Which surface would produce the maximum pressure when the same force is applied?

A. Large flat surface
B. Wide tyre
C. Small pointed surface
D. Wooden plank

10. Study the plant cell diagram provided.



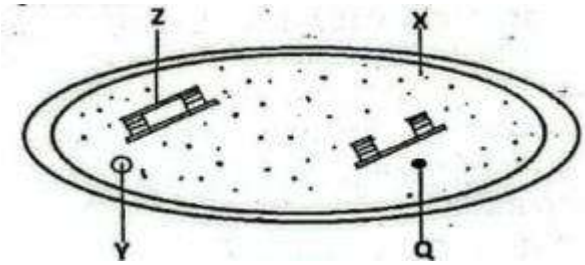
Identify the part labelled **T**.

A. Vacuole B. Nucleus
C. Cytoplasm D. Cell membrane

11. A wind turbine changes:

A. Kinetic energy into light energy
B. Kinetic energy into electrical energy
C. Electrical energy into kinetic energy
D. Chemical energy into wind energy

12. Study the chloroplast diagram provided.



Which labelled part represents the lamella?

A. Y
B. Z
C. X
D. O

13. A fire starts in a computer laboratory due to an electrical fault. Which extinguisher should be used?

A. Dry powder extinguisher
B. Foam extinguisher
C. Water extinguisher
D. Wet chemical extinguisher

14. During an experiment, a learner needs to measure exactly 25 ml of liquid. Which apparatus should be used?

A. Pipette
B. Burette
C. Measuring cylinder
D. Conical flask

15. Which of the following is the best way for adolescents to reduce the risk of contracting STIs?

A. Avoiding crowded places
B. Having unprotected sexual contact
C. Abstaining from sexual intercourse
D. Avoiding vaccination

16. Which part of a plant cell stores cell sap and waste products?

A. Nucleus
B. Chloroplast
C. Vacuole
D. Cytoplasm

17. Which STI is caused by a virus and may lead to chronic symptoms including weight loss?

A. Gonorrhoea
B. Syphilis
C. Herpes
D. HIV/AIDS

18. Consider the following food chain:

Grass → Grasshopper → Mouse → Snake → Eagle

The snake in the food chain is a:

A. Tertiary consumer
B. Primary consumer
C. Producer
D. Quaternary consumer

19. Which of the following is NOT a characteristic of fruits dispersed by animals?

A. Succulent fruits
B. Scented fruits
C. Brightly coloured fruits
D. Parachute structures

20. What colour is formed when copper(II) sulphate crystals dissolve in water?

A. Blue
B. Green
C. Colourless
D. Pink

21. Why is octane used instead of water in solvent extraction of oils?

A. It dissolves oil better.
B. It is safer.
C. It reacts with the seeds.
D. It changes the oil colour.

22. Which of the following household items is likely to be basic?

A. Soap
B. Vinegar
C. Lemon juice
D. Tomato sauce

23. Which of the following is NOT excreted by the kidneys?

A. Urea
B. Water
C. Oxygen
D. Salt

24. Okello used table salt to keep snails away from his house. The salt dehydrated the snails causing death. Which process was responsible?

A. Dehydration
B. Diffusion
C. Active transport
D. Osmosis

25. A technician finds that a circuit is incomplete, preventing current flow. This is known as:

A. Closed circuit
B. Short circuit
C. Open circuit
D. Parallel circuit

26. An element has an electronic configuration of 2.8.7. Identify the element.

A. Oxygen
B. Fluorine
C. Argon
D. Chlorine

27. An atom has a mass number of 28 and an atomic number of 14. Calculate the number of neutrons.

A. 14
B. 28
C. 15
D. 13

28. Which element has the symbol Fe?

A. Silver B. Iron C. Copper D. Lead

29. Which class of fire involves electrical appliances?

A. Class A B. Class C
C. Class E D. Class F

30. Which of the following solutions will boil at the highest temperature?

A. Pure water
B. Distilled water
C. Salt water
D. Rain water

SECTION B: STRUCTURED QUESTIONS (40 MARKS)

31. Study the food web below and answer the questions that follow.

Grass → Grasshopper → Frog → Snake → Hawk
Grass → Rabbit → Hawk
Grass → Mouse → Snake → Hawk
Grass → Sparrow → Hawk

a) Identify the organism that occupies the highest trophic level. (1 Mark)

_____

b) Construct a food chain that ends with the hawk as a tertiary consumer. (2 Marks)

c) Identify the producer. (1 Mark)

_____

d) Name the trophic level occupied by:

i. Grasshopper (1 Mark)

_____

ii. Frog (1 Mark)

_____

e) Name the ultimate source of energy that drives the food web. (1 Mark)

_____

f) What would happen if all snakes were killed? (2 Marks)

_____

_____

_____

32. Identify two ways through which energy is lost in a food chain. (2 Marks)

5

i. _____

ii. _____

33.

a) A box measuring 0.4 m × 0.2 m rests on a table. If its weight is 80 N, calculate the pressure exerted on the table. (3 Marks)

b) A tractor has wide tyres. Explain how this helps reduce pressure on the ground. (2 Marks)

_____

_____

34. State the energy transformations that occur in:

a) A radio (1 Mark)

_____

_____

b) A solar panel (1 Mark)

_____

_____

35. Highlight two roles of diffusion in animals. (2 Marks)

i. _____

ii. _____

36.

a) List three contents of gastric juice. (3 Marks)

i. _____

ii. _____

iii. _____

b) State the role of sodium hydrogen carbonate in the duodenum. (1 Mark)

_____

_____

6

37. The table below shows results obtained when different water samples were tested with soap.

Water Sample	Volume of Soap Required Before Boiling (cm^3)	Volume of Soap Required After Boiling (cm^3)
X	8.0	4.0
Y	12.0	6.0
Z	2.5	2.5
V	7.0	3.0

a) What factor must remain constant for a fair comparison? (1 Mark)

_____

b) Which water samples are likely to have temporary hardness? (2 Marks)

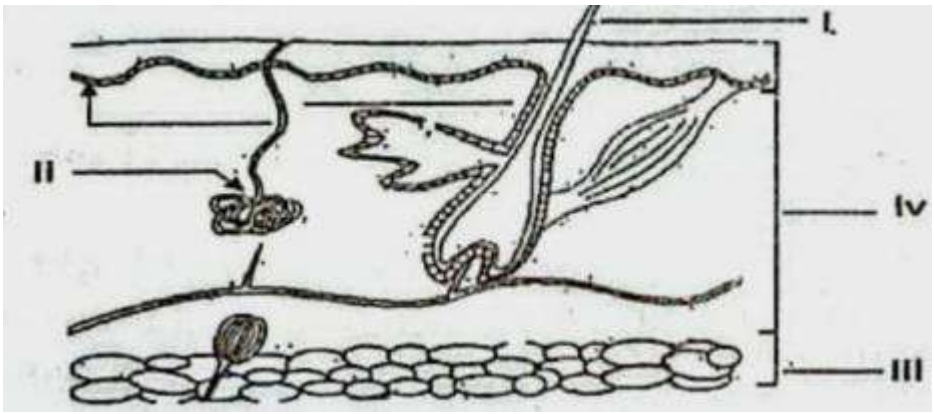
_____

c) Which water sample represents distilled water? (1 Mark)

_____

_____

38. Study the mammalian skin diagram provided and answer the questions.



a) Name the parts labelled by your teacher. (4 Marks)

i. _____

ii. _____

iii. _____

iv. _____

39. List three characteristics of wind-pollinated flowers. (3 Marks)

i. _____

ii. _____

iii. _____

40. Brass is an alloy of two metals. Name the metals. (2 Marks)

i. _____

ii. _____

41. Lameya came across the decaying remains of an antelope that had been killed by a predator.

a) Name two organisms responsible for decomposition. (2 Marks)

i. _____

ii. _____

b) State the role of the organisms named above. (1 Mark)

_____

_____

INTEGRATED SCIENCE

SECTION A: MULTIPLE CHOICE (1-30)

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

SECTION B: STRUCTURED ANSWERS

31. Food web

a) Hawk

b) Example food chain:
Grass → Grasshopper → Frog → Hawk

c) Grass

d)
i. Grasshopper – Primary consumer
ii. Frog – Secondary consumer

e) Sun

f) Grasshoppers and mice populations would increase, while hawk food supply would reduce, causing imbalance in the food web.

32. Energy loss in food chain

i. Respiration (heat loss)
ii. Waste materials (faeces/excretion)

33. Pressure

a)
Area = 0.4 × 0.2 = 0.08 m^2
Pressure = 80 ÷ 0.08 = **1000 Pa**

b) Wide tyres increase surface area, reducing pressure on the ground.

34. Energy transformations

a) Radio: Electrical energy → Sound energy
b) Solar panel: Light energy → Electrical energy

35. Roles of diffusion in animals

i. Gas exchange in lungs (oxygen in, carbon dioxide out)
ii. Absorption of digested food in intestines

36. Gastric juice

a)
i. Hydrochloric acid
ii. Pepsin
iii. Mucus

b) Neutralises acidic chyme from the stomach to provide suitable conditions for enzymes.

37. Water hardness table

a) Volume of water sample (or conditions used) must remain constant

b) Temporary hardness: **X, Y, V**

c) Distilled water: **Z**

38. Mammalian skin diagram

i. Hair
ii. Sweat gland
iii. Dermis
iv. epidermis

39. Wind-pollinated flowers

i. Small, dull or no petals
ii. Large feathery stigma
iii. Produce large quantities of light pollen

40. Brass

i. Copper
ii. Zinc

41. Decomposition

a)
i. Bacteria
ii. Fungi

b) They break down dead organic matter into simpler substances, recycling nutrients back into the soil.