ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

COMBINED SCIENCE 4003/1

PAPER 1 Multiple Choice

NOVEMBER 2020 SESSION 1 hour

Additional materials:
- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)
- Calculator (optional)

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.
Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions.
For each question, there are four possible answers, **A, B, C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score **one** mark.
A mark will **not** be deducted for a wrong answer. Any rough working should be done in this booklet.

This question paper consists of 16 printed pages.

1. Which one is a biological component of an ecosystem?

A air

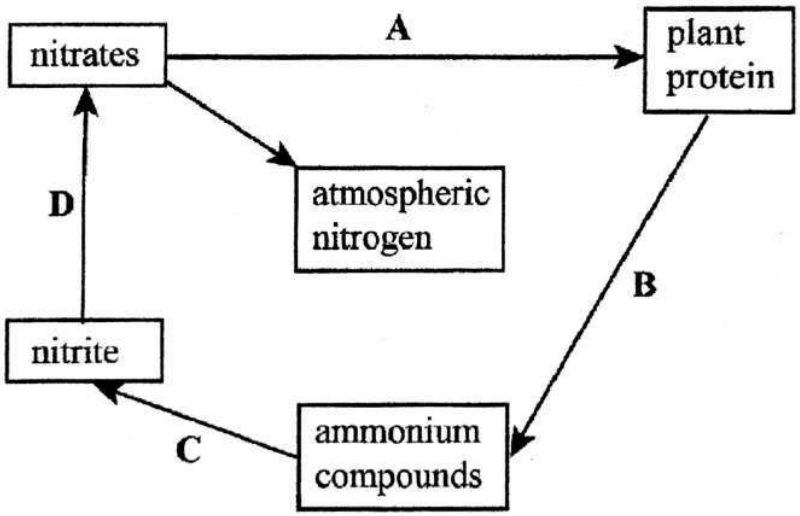
B soil

C water

D humus

2. The diagram shows some stages in the nitrogen cycle.

Which arrow, **A, B, C** or **D**, represents the action of decomposers?



3. Which equation shows the process of anaerobic respiration in humans?

A glucose $\longrightarrow$ lactic acid + energy

B glucose + $\longrightarrow$ ethanol + energy

C glucose $\longrightarrow$ lactic acid + carbon dioxide + energy

D glucose + oxygen $\longrightarrow$ ethanol + carbon dioxide + energy

4. During germination, the seed coat breaks due to the uptake of

A carbon dioxide.

B mineral salts.

C oxygen.

D water.

5. Which organ produces bile?

A liver

B stomach

C pancreas

D gall bladder

6. Plasmolysis causes the

A cell membrane to move away from the cell wall.

B cell membrane to move towards the cell wall.

C turgor pressure inside the cell to increase.

D water molecules to move into the cell.

7. Which factor decreases the rate of transpiration in a plant?

A large leaf surface area

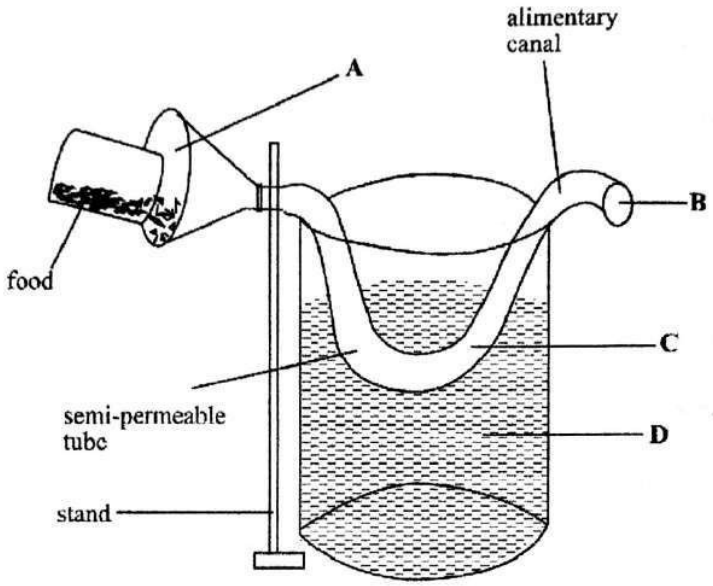
B high light intensity

C high temperature

D high humidity

8. The diagram shows a model of the human alimentary canal.

Which part, **A, B, C or D**, represents where ingestion takes place?



9. Which type(s) of blood vessels contain(s) valves?

A veins and capillaries

B capillaries

C arteries

D veins

10. Which statement about asexual reproduction is true?

A Offspring are resistant to diseases that affect parents.

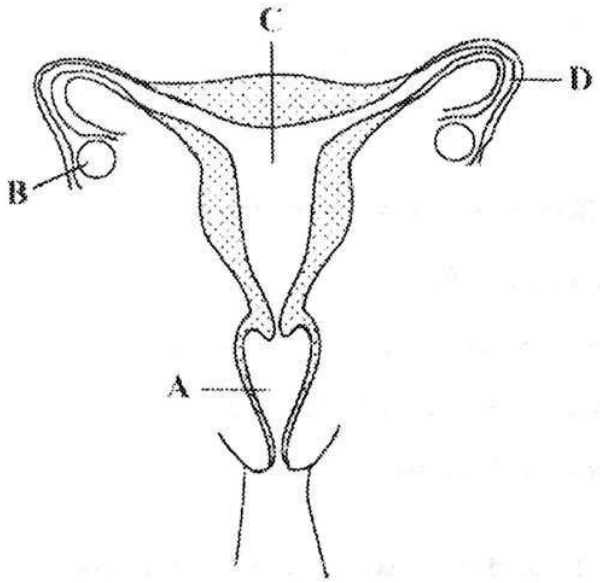
B Offspring grow far away from parents.

C Many new plants are obtained from seeds.

D Offspring are genetically identical to their parents.

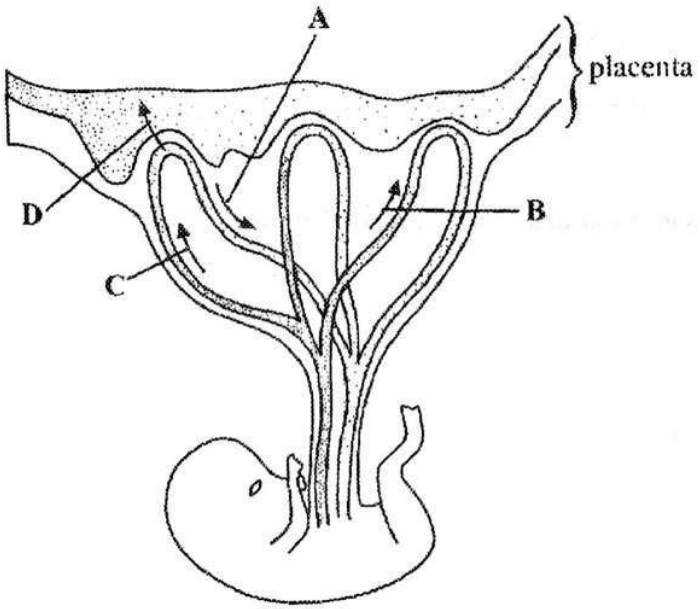
11. The diagram shows the female reproductive system.

Where does fertilisation take place?



12. The diagram shows an embryo attached to the placenta.

Which arrow, **A, B, C or D**, shows the movement of nutrients?



13. Hormones that are found in the contraceptive pill work by

A preventing maturing of the egg.

B killing sperm cells in the oviduct.

C preventing fertilisation of the egg.

D preventing implantation of the embryo.

14. What is the effect of HIV on the human body?

A HIV makes it easier for pathogens to invade cells.

B HIV reduces the body's resistance to infection.

C HIV reduces the number of red blood cells.

D HIV destroys all body tissues.

15. Which method is used to produce concentrated ethanol from a dilute ethanol solution?

A filtration

B decanting

C simple distillation

D fractional distillation

16. What is the electronic configuration of nitrogen, $^{14}_{7}N$?

A 2, 5

B 2, 2, 3

C 2, 8, 4

D 2, 2, 8, 2

17. Which one is an Isotope of $^{16}_{8}O$?

A $^{16}_{6}O$

B $^{18}_{6}O$

C $^{18}_{8}O$

D $^{8}_{16}O$

18. Element X has the electronic structure 2, 8, 2.

What is the formula of its chloride?

A XCl

B XCl_2

C X_2Cl

D X_2Cl_2

19. What is the concentration of sodium hydroxide solution which is prepared by dissolving 40 g of sodium hydroxide pellets in 50 dm^3 of distilled water?
[Molecular mass of NaOH is 40 g]

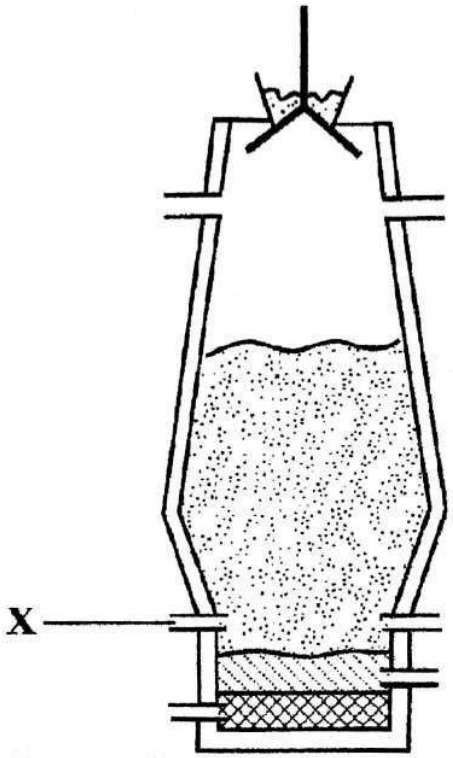
A 0.02 mol/dm^3

B 0.8 mol/dm^3

C 1.0 mol/dm^3

D 2000.0 mol/dm^3

20. The diagram shows a blast furnace.



What is the function of the opening labelled **X**?

A to remove slag

B to remove iron

C to allow hot air in

D to allow raw materials in

21. Which industrial gas, produced from the electrolysis of water, is used in hospitals?

A ammonia

B hydrogen

C nitrogen

D oxygen

22. Which one is **not** a use of chlorine?

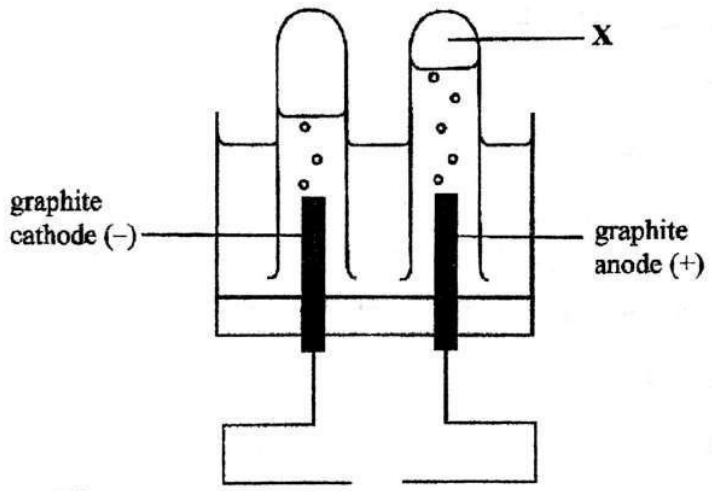
A sterilising water

B as an electrolyte

C making domestic bleaches

D manufacture of plastics

23. The diagram shows incomplete apparatus needed for the electrolysis of water.



What is gas **X**?

A chlorine

B hydrogen

C nitrogen

D oxygen

24. During the electroplating of an iron nail with copper,

A hydrogen gas is produced at the cathode.

B the copper sulphate solution turns green.

C the cathode increases in mass.

D the anode increases in mass.

25. Which catalyst is used in the production of ammonia?

A iron

B rhodium

C platinum

D vanadium (V) oxide

26. Global warming is caused by

A combustion of fuels.

B formation of ice.

C rise in sea level.

D reforestation.

27. To which homologous series does ethanol belong?

A alkanes

B alkenes

C alkynes

D alcohols

28. What is the S.I unit of volume?

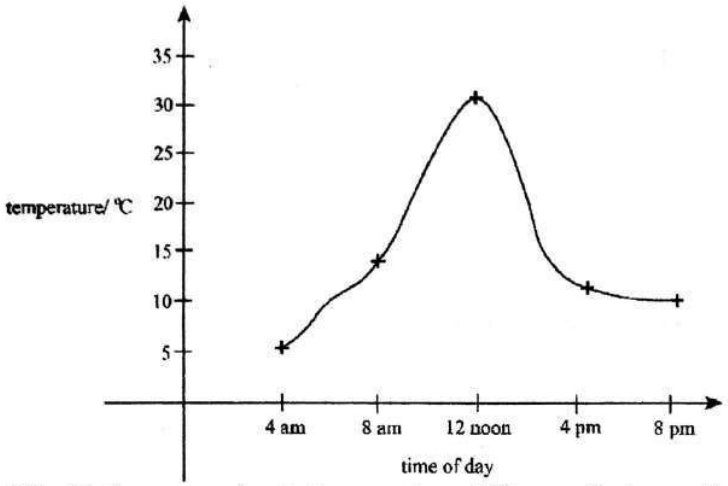
A cm^2

B cm^3

C m^2

D m^3

29. The sketch graph shows temperature changes during a day.



What is the approximate temperature difference between the hottest and coldest time of the day?

A 5 °C

B 26 °C

C 30 °C

D 35 °C

30. A beaker of water is heated at the base.

Why does the water at the base rise?

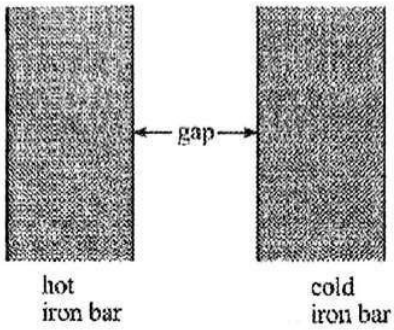
A It contracts and becomes less dense.

B It contracts and becomes more dense.

C It expands and becomes less dense.

D It expands and becomes more dense.

31. A hot iron bar and a cold iron bar are placed next to each other as shown by the diagram.



Which material can be used to fill up the gap so that heat can be transmitted the fastest?

A metal

B wood

C water

D air

32. A negatively charged sphere is suspended by a thread.
What happens to the sphere when a negatively charged rod is brought near it?

A the sphere is attracted to the rod

B the sphere is repelled by the rod

C the sphere reduces in size

D the sphere increases in size

33. What is the function of a petrol filter in a carburetor?

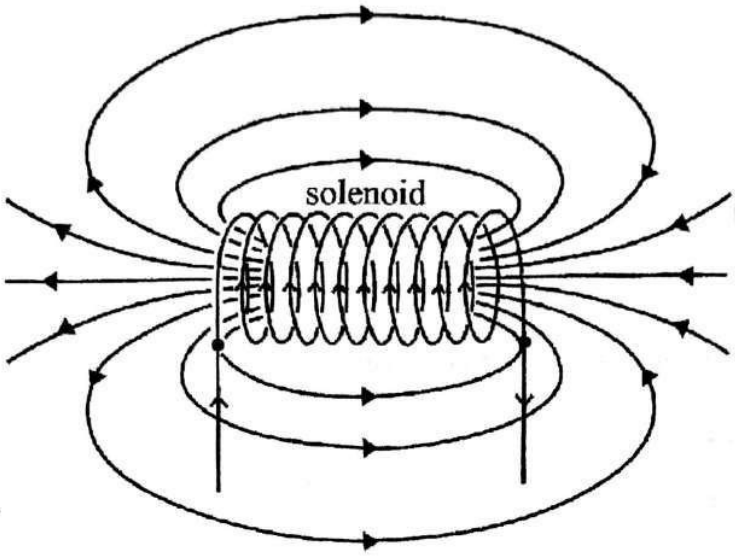
A to compress the fuel-air mixture

B to mix the fuel and air

C to clean the fuel

D to clean the air

34. The diagram below shows the magnetic field pattern in a solenoid.



The magnetic field strength is increased by

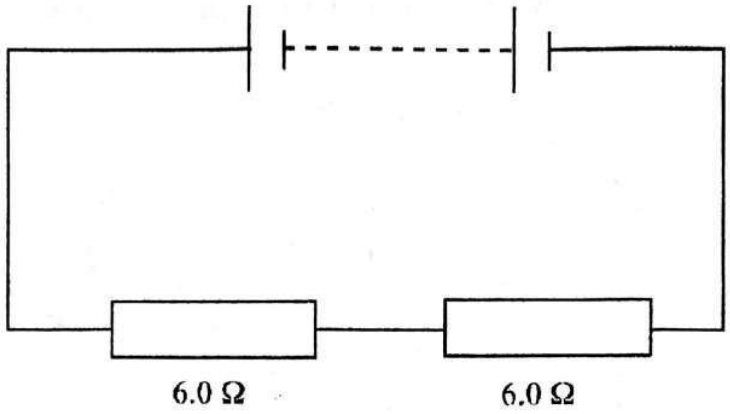
A reducing the current in the solenoid.

B increasing the current in the solenoid.

C increasing the diameter of the solenoid.

D reducing the number of turns in the solenoid.

35. The diagram shows a battery connected to two 6 Ω resistors.



What is the total resistance of the circuit?

A 0.33 Ω

B 3.00 Ω

C 6.00 Ω

D 12.00 Ω

36. What is pressure exerted on a 2 m^2 surface when a force of 20 N is applied on it?

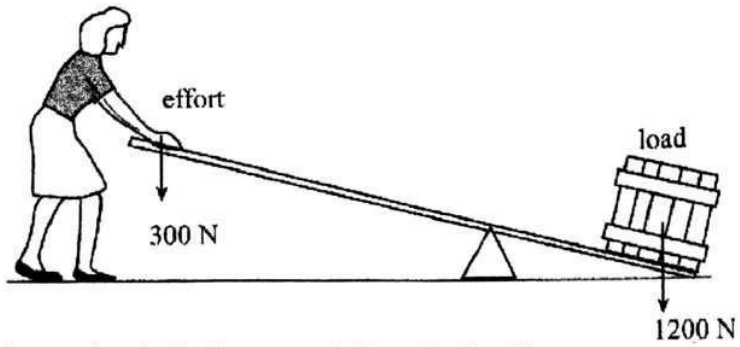
A 0.1 Pa

B 10.0 Pa

C 38.0 Pa

D 40.0 Pa

37. The diagram shows a machine lifting a load.



How is the mechanical advantage, MA, calculated?

A 300 N × 1200 N

B 300 N ÷ 1200 N

C 1200 N – 300 N

D 1200 N ÷ 300 N

38. A cellphone is described as

A a demodulator.

B a modulator.

C an amplifier.

D a transceiver.

39. The flow chart shows part of the processing of a signal.

receiver → decoder → human

What is the function of the decoder?

A to amplify the signal

B to shorten the wave

C to mix the sound wave with the carrier wave

D to separate the sound wave from the carrier wave

40. The diagram shows a 3-pin plug.

At which position, **A, B, C** or **D**, is the live wire connected?