FINALPREPS ASSESMENTS AND EVALUATIONS

Mock Examination for B.E.C.E Candidates

October 2025

SCIENCE 2 & 1
(ESSAY AND OBJECTIVE TEST)

2 hours

Name: .....

Index Number: .....

INSTRUCTIONS

Do not open this booklet until you are told to do so. While you are waiting, read and observe the following instructions carefully. Write your name and index number in ink in the spaces provided above.

This booklet consists of two papers. Answer Paper 2 which comes first, in your answer booklet and Paper 1 on your Objective Test answer sheet provided. Paper 2 will last 60 minutes after which the answer booklet will be collected. Do not start Paper 1 until you are told to do so. Paper 1 will last 60 minutes.

This paper is an essay paper made of 2 sections: Section A and Section B. Answer Question 1 in Section A and any other three questions in Section B. Answer all questions in your answer booklet. Credit will be given for clarity of expression and orderly presentation of material.

PAPER 2 (ESSAY) – [60 marks] -1 HOUR 15 MINUTES

PART I [40 MARKS]

Answer all of Question 1

1. (a) Fig. 1(a) is an illustration of a system in the human body modelled using simple materials by students in a school's laboratory. Study it carefully and answer the questions that follow.

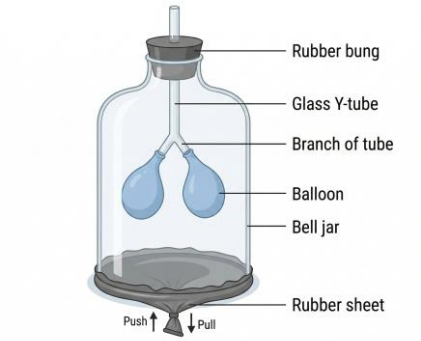

Fig. 1 (a)

(i) Explain the main importance of the system to the human body.
(ii) Name the organ of the human system that is represented by the:

(α) branch of tube (β) bell jar (γ) rubber sheet

(iii) Give one function of each of the organs of the human body represented by:

(α) balloon (β) glass tube (γ) rubber bung

(iv) State the major role played by the organ represented by the rubber sheet during breathing.
(v) Mention two diseases that affect the human body system modelled above. **[10 marks]**

(b) In an experiment to demonstrate the property of electronic circuit components, a B.E.C.E. science candidate connected a 9 V cell, a 1000 Ω resistor, key, an ammeter, LED and flexible copper wire. He connected it in such a way that the positive terminal of the cell was connected to the positive part of the LED. Use the information to answer the questions that follow:

(i) Draw a closed circuit diagram for the arrangement of all the components.
(ii) State the observation made as soon as the circuit is closed.
(iii) State the reason for including the following components in the circuit:

α) The 1000 Ω resistor β) The 9 V cell γ) Ammeter

(iv) State the observable change in the behaviour of the LED if the 1000 Ω resistor is replaced with a 100 Ω resistor. Explain your answer.

(v) What conclusion can be drawn from the observation in (iii) above? **[10 marks]**

(c) Fig. 1 (c) is an illustration of an ionic structure formed from an atom of an element. Study it carefully and answer the questions that follow.

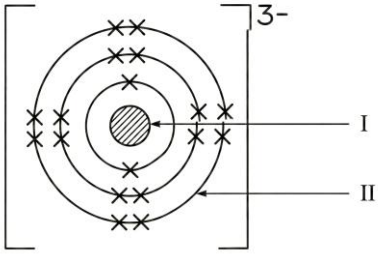

Fig. 1 (c)

(i) Deduce from the diagram:
(α) the number of protons of the ion
(β) the number of electrons of the ion

(ii) Name the ion and state the type of ion.

(iii) Draw the electronic configuration of the atom.

(iv) Briefly explain how the ion illustrated above is formed from the atom.

(v) Give three differences between atoms and ions. **[10 marks]**

(d) Fig. 1(d) below illustrates products for replenishing soil nutrients. Study it carefully and answer the questions that follow:

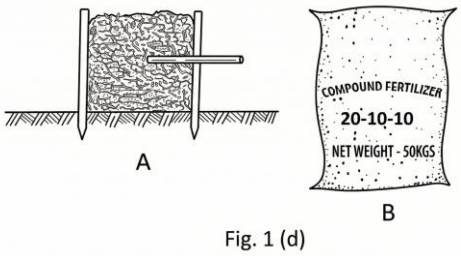

Fig. 1 (d)

(i) Explain the inscription "compound fertilizer" indicated on product B.

(ii) Name the method used in the preparation of the product illustrated in A above.

(iii) List any two materials that can be used in the preparation of product A.

(iv) State three differences between products A and B.

(v) Mention three disadvantages of using product B for crop production. **[10 marks]**

SECTION B [60 MARKS]

Answer only three questions from this section.

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2. (a) (i) Name two products each of the following processes:

(α) aerobic respiration (β) anaerobic fermentation

(ii) Explain briefly the function of the mucus lining of the human respiratory tract. **[6 marks]**

(b) (i) Explain the term tillage as used in crop production.

(ii) Give three advantages of tillage. **[4 marks]**

(c) A student eats a bowl of rice worth 80 J of energy. He ran a 100 m race using 50 J of energy.

(i) State the energy conversion that took place in the running of the race.

(ii) Determine the efficiency of the student's energy conversion. **[4 marks]**

(d) Fig 1 (d) shows a section of the periodic table. The letters indicated are not actual chemical symbols of elements. Use it to answer the questions that follow.

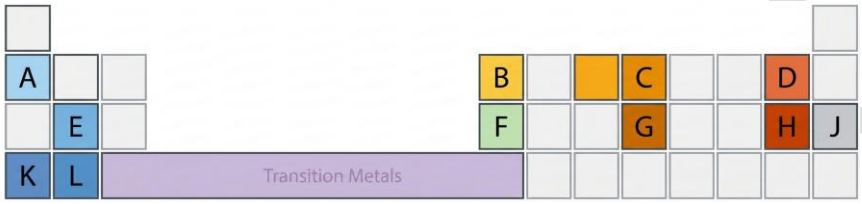

Fig 2 (d)

(i) Identify a letter that represents a noble gas on the periodic table.
(ii) Give the names and chemical symbols of the elements labelled as A, G and K.
(iii) Name the type of bond formed between the elements H and L.
(iv) Give one common characteristic of the elements labelled B and F. **[6 marks]**

3. (a) (i) Give the formula of the stable binary compound formed by the following elements:

(α) Aluminium and chlorine (β) Fluorine and potassium (γ) Nitrogen and hydrogen

(ii) Give two characteristics of chemical compounds. **[5 marks]**

(b) (i) Explain why convection cannot take place in solids.

(ii) Give two applications of convection in everyday life. **[4 marks]**

(c) (i) List three factors of soil formation.

(ii) State two differences between sedimentary rocks and igneous rocks. **[5 marks]**

(d) (i) Name one reagent used to test for each of the following food substances:

(α) Protein (β) Reducing sugar (γ) Starch

(ii) Give the colour observed to show positive test of the reagent on each of the food substances above. **[6 marks]**

4. (a) Fig. 4 (a) below shows a simple pendulum that consists of a large ball at the end of a string moving through positions A, B and C in air. Study it carefully and answer the questions that follow:

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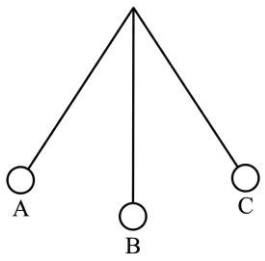

Fig. 4 (a)

(i) Give the type of energy possessed by the ball each at positions A, B and C.

(ii) State what happens to the velocity of the ball as it moves from:

(α) position B to C (β) position A to B **[5 marks]**

(b) (i) Give two examples each of mixtures of:

(α) two immiscible liquids (β) two miscible liquids

(ii) Name one apparatus used in the separation of two immiscible liquids. **[5 marks]**

(c) (i) State two common advantages of crop rotation and land rotation.

(ii) Give two reasons why planting crops in rows is advantageous. **[4 marks]**

(d) (i) Name three ways by which disease-causing organisms enter the human body.

(ii) State one way through which houseflies spread diseases to humans.

(iii) List two diseases that are spread by houseflies. **[6 marks]**

5. (a) (i) Describe how a shadow is formed. Support your answer with a labelled diagram.

(ii) Give three differences between lunar eclipse and solar eclipse. **[6 marks]**

(b) (i) Explain the term soil fertility.

(ii) Differentiate between major nutrients and minor nutrients.

(iii) Give two examples of trace elements. **[5 marks]**

(c) (i) Define nitrogen cycle?

(ii) State any two processes each that:

(α) add nitrogen to the soil (β) remove nitrogen from the soil **[5 marks]**

(d) Differentiate between solids and gases based on the following properties:

(i) Kinetic energy of particles
(ii) Compressibility
(iii) Density
(iv) Arrangement of particles **[4 marks]**

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SECTION A (OBJECTIVE TEST)

1. What is the valency of chlorine atom?

A. 3 B. 4 C. 1 D. 2

2. Which of the following organisms is a unicellular eukaryote?

A. Algae B. Amoeba C. Archaea D. Fungi

3. Which of the following is a micronutrient?

A. Magnesium B. Manganese

C. Potassium D. Sulphur

4. Tapeworm living in the small intestine of humans illustrates:

A. competition B. parasitism

C. predation D. mutualism

5. In the manufacturing of local soap, the solution obtained from the ash of burnt cocoa pod is a source of:

A. alkali B. salt C. fat D. oil

6. Which of the following processes could be used to obtain water from a salt solution?

A. Filtration B. Decantation

C. Evaporation D. Distillation

7. The processes that absorb and store carbon in various forms are termed

A. sink. B. source.

C. photosynthesis. D. dissolution.

8. Which part of the tooth is the hardest and provides protection?

A. Dentin B. Cementum

C. Enamel D. Pulp

9. Why is energy conversion important in everyday life? It

A. allows for the creation of energy.

B. reduces the need for renewable resources.

C. enables the use of energy in various forms for different applications.

D. decreases overall energy usage.

10. Which of the following is a non-renewable resource often found in waste?

A. Organic waste B. Plastic

C. Paper D. Food scraps

11. When two objects at different temperatures come into contact, what happens?

A. The hotter object becomes hotter

B. The cooler object becomes cooler

C. Heat flows from the cooler object to the hotter object

D. Heat flows from the hotter object to the cooler object

12. How does climate change potentially affect Anopheles mosquito populations? It

A. reduces their habitat.

B. shortens their lifespan.

C. expands their breeding areas.

D. makes them less active.

13. Which of the following substances can dissolve almost all solutes?

A. Kerosene B. Palm oil

C. Water D. Turpentine

14. Female mosquitoes feed on

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A. blood. B. nectar C. larva D. flowers

15. What part of the tooth anchors it to the jawbone?

A. Enamel B. Dentin C. Pulp D. Cementum

16. Which process converts solar energy into chemical energy?

A. Combustion B. Photosynthesis

C. Respiration D. Evaporation

17. The measure of how hot a substance is, is known as its

A. boiling point. B. melting point.

C. temperature. D. freezing point.

18. What happens to a substance's temperature when it absorbs heat without changing state? It

A. decreases. B. remains constant.

C. increases. D. depends on the material.

19. What is a common misconception about Anopheles mosquitoes? They

A. only bite humans.

B. can't fly in the rain.

C. are active only at night.

D. can survive without water.

20. Which practice involves turning waste into energy?

A. Landfilling B. Incineration

C. Composting D. Recycling

21. When salt is put into soup it

A. melts. B. sublimes

C. dissolves. D. evaporates.

22. How long does the Anopheles mosquito typically remain in the larval stage?

A. 1-2 days B. 4-14 days

C. 20-30 days D. Over a month

23. What part of the tooth helps resist the forces of chewing?

A. Pulp B. Enamel

C. Cementum D. Dentine

23. Which of the following sources of energy is non-renewable?

I. Coal II. Solar III. Wind IV. Uranium-236

A. I, II and III only B. II, III and IV only.

C. I and IV only D. II and III only

24. Which method is considered the least sustainable for waste disposal?

A. Composting B. Recycling

C. Landfilling D. Source reduction

25. What is a key characteristic of the Anopheles mosquito that distinguishes it from other mosquitoes?

A. It is larger than most mosquitoes

B. It feeds during the day

C. It rests at a 45-degree angle

D. It only breeds in saltwater

26. What is the primary mode of heat transfer in fluids?

A. Conduction B. Convection

C. Radiation D. Sublimation

27. Which of the following statements about the dentine of tooth is/are correct?

I. It is beneath the enamel.

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II. It occupies the largest part of the tooth.

III. It contains the crown of the tooth.

A. I only. B. I and II only

C. II and III only D. I, II and III

28. A clear solution of sugar was cooled from 100°C to 25°C. Some solid sugar was seen to have formed out of the solution after the cooling. This shows that sugar

A. does not dissolve in cold water.

B. does not dissolve in hot water.

C. dissolves more in hot water than in cold water.

D. dissolves more in cold water than in hot water.

29. Which of the following materials is least likely to be recycled?

A. Paper B. Steel C. Styrofoam D. Glass

30. How many main groups of nutrients are found in food?

A. Five B. Six C. Seven D. Ten

31. Pastoral farming is also known as?

A. Organic farming B. Crop rotation

C. Nomadic D. Land rotation

32. .....is a system which farming is done in a large area and animals are allowed to roam in an enclosed area.

A. Extensive farming B. Intensive farming

C. Land rotation D. Crop rotation

33. Biotic component of an ecosystem is the ..... in the environment.

A. Living things B. Non-living things

C. Dead D. Environment

34. Which of the following is not an aquatic habitat?

A. Lagoon B. River

C. School garden D. Sea

35. Nuclear energy is also known as....

A. Atomic energy B. Thermal energy

C. Radiation energy D. Vibration energy

36. A mirror can be used to redirect sunlight into your classroom by.....

A. Refraction B. Dispersion

C. Reflection D. Mirage

37. The following are examples of luminous bodies except.....

A. A sun B. Star C. Water D. Food

38. What form of energy is stored in fossil fuels?

A. Mechanical B. Chemical

C. Heat D. Kinetic

39. Which of the following plants produces radioactive waste?

A. Nuclear B. Solar

C. Thermal D. Potential

40. A circuit that allows continuous flow of current is called.... .....?

A. Series circuit B. Closed circuit

C. Opened circuit D. Tight circuit

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