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WordPub

BECE

Integrated Science

Past Questions and Answers

2010

**Junior High School
Years 1, 2 & 3**

Compiled by:



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- **Teachers, parents and educational institutions** – for your continuous patronage and tireless efforts at ensuring quality education for the 21st century child
- Junior High School **students** – you are the ultimate reason for this work.

DEDICATION

To the Lord **Jesus Christ**, our Saviour and soon-coming King

April 2010

INTEGRATED SCIENCE 1

OBJECTIVE TEST

45 minutes

1. Water that forms lather readily with soap is said to be
 - A. clean
 - B. hard
 - C. soapy
 - D. soft

2. Which of the following life activities are common to both plants and animals?
 - I. Feeding
 - II. Locomotion
 - III. Respiration
 - A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

3. A suitable instrument that could be used to measure the internal diameter of a bamboo flute is
 - A. beam balance
 - B. metre rule
 - C. surveyor's tape
 - D. vernier calipers

4. The ability of soils to supply the right amounts of essential nutrients to plants is known as
 - A. soil consistency
 - B. soil fertility
 - C. soil structure
 - D. soil texture

5. The simplest way of making well water suitable for laundry purposes is by
 - A. adding alum
 - B. boiling
 - C. chlorination
 - D. filtering

6. Washing down of soil nutrients beyond the reach of roots of plants is referred to as
 - A. aeration
 - B. infiltration
 - C. leaching
 - D. percolation

7. Which of the following statements explain(s) why an object floats in water?
A floating object
I. is less dense than water
II. is denser than water
III. has the same density as water
- A. I only
B. II only
C. III only
D. I and III only
8. An example of leafy vegetable crops is
A. cucumber
B. lettuce
C. okro
D. onion
9. The structure in the respiratory system of humans where gaseous exchange occurs is
A. alveolus
B. bronchus
C. nostril
D. trachea
10. The gas produced when glucose is oxidized during internal respiration is
A. carbon (II) oxide
B. carbon (IV) oxide
C. hydrogen
D. nitrogen
11. The farm animal which has crop as part of its digestive system is the
A. fowl
B. goat
C. pig
D. sheep
12. A beneficial effect of wind on the environment is
A. promotion of photosynthesis in green plants
B. pollination in flowering plants
C. leaching in soils
D. erosion in soils
13. The chemical solution that can be used to test for the presence of protein in food substances is
A. Benedict's solution

- B. Fehling's solution
- C. Iodine solution
- D. Million's reagent

14. Which of the following statements about bushfires is/are true?

- I. They cause air pollution
- II. They deplete vegetation cover
- III. They contribute to global warming

- A. I only
- B. II only
- C. II and III only
- D. I, II and III

15. The most effective method of controlling soil erosion on steep slopes is

- A. cover cropping
- B. mulching
- C. strip cropping
- D. terracing

16. Which of the following agencies is responsible for providing information on the weather and climatic conditions of an area?

- A. Animal Husbandry Department
- B. Extension Services Department
- C. Information Services Department
- D. Meteorological Services Department

17. The farming system which involves the growing of one type of crop on the same piece of land every season is known as

- A. mixed cropping
- B. mixed farming
- C. mono cropping
- D. monoculture

18. The fifth planet from the sun in the solar system is

- A. Jupiter
- B. Mars
- C. Neptune
- D. Venus

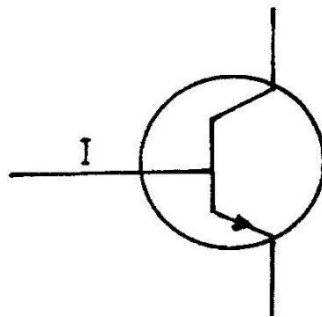
19. The process that takes place when the sperm and the egg of humans fuse together is referred to as

- A. fertilization
- B. menstruation
- C. ovulation
- D. reproduction

20. The process by which water vapour moves through the stomata of leaves into the atmosphere is known as
- A. absorption
 - B. diffusion
 - C. osmosis
 - D. transpiration

21. An example of intensive system of poultry keeping is the
- A. deep litter system
 - B. fold unit system
 - C. free range system
 - D. Free-running system

The diagram below represents a circuit symbol in an electronic device. *Study it carefully and use it to answer questions 22 and 23*



22. The symbol represents
- A. a light emitting diode
 - B. *n-p-n* transistor
 - C. light dependent resistor
 - D. *p-n-p* transistor
23. The part of the diagram labelled I has
- A. more electrons than holes
 - B. no holes
 - C. more holes than electrons
 - D. the same number of holes as electrons
24. A spot made on a white paper with a given food substance turned the spot on the paper translucent. The food substance is likely to contain
- A. glucose
 - B. oil
 - C. protein
 - D. starch
25. Which of the following sources of energy is non-renewable?
- A. Sun
 - B. Waves
 - C. Wind

D. wood

26. Which of the following farm animals is / are housed in a hutch?

- I. Goats
- II. Pigs
- III. Rabbits

- A. I only
- B. II I only
- C. I and II only
- D. II and III only

27. Which of the following blood vessels carries deoxygenated blood?

- A. Aorta
- B. Pulmonary artery
- C. Pulmonary vein
- D. Renal artery

28. The energy transformation that takes place in a car battery is

- A. electrical energy → chemical energy → light energy
- B. chemical energy → light energy → electrical energy
- C. chemical energy → electrical energy → light energy
- D. electrical energy → light energy → chemical energy

29. The type of liquid suitable to construct a thermometer to read temperatures of about 150°C is

- A. alcohol
- B. mercury
- C. turpentine
- D. water

30. Amino acids are the end-products of the digestion of

- A. carbohydrates
- B. fats
- C. oils
- D. proteins

31. The type of teeth used by mammals to cut food materials is

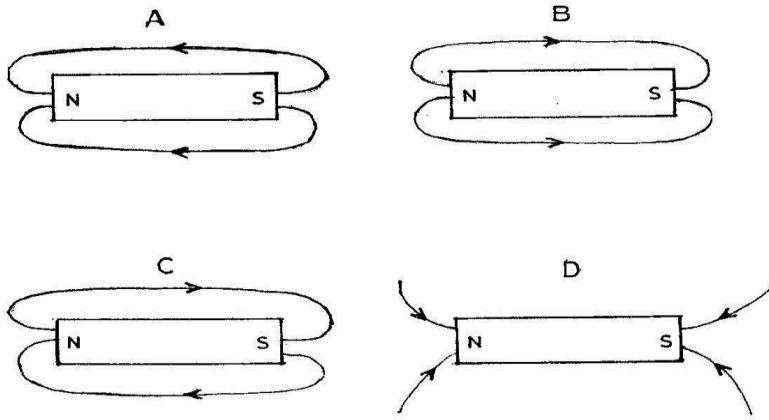
- A. canine
- B. incisor
- C. molar
- D. premolar

32. Fishponds are often stocked using

- A. anchovies
- B. fingerlings
- C. fish eggs

D. frys

33. Which of the following processes result(s) in the formation of a new substance?
- I. Burning of wood
 - II. Rusting of iron nail
 - III. Heating water into vapour
- A. I only
B. I and II only
C. II and III only
D. I, II and III
34. The use of resistant breeds of farm animals in controlling diseases is a
- A. biological control method
 - B. chemical control method
 - C. cultural control method
 - D. physical control method
35. A load of 10 N is moved through a distance of 2 m. Calculate the work done.
- A. 5 J
 - B. 10 J
 - C. 20 J
 - D. 50 J
36. Which of the following components of human blood is dissolved in the plasma?
- A. Mineral salts
 - B. Phagocytes
 - C. Platelets
 - D. Red blood cells
37. An atom of carbon is represented as ^{12}C . How many neutrons are in the nucleus of the carbon atom?
- A. 2
 - B. 4
 - C. 6
 - D. 12
38. In agribusiness, middlemen operate within the
- A. production chain
 - B. processing chain
 - C. supply chain
 - D. value chain
39. Which of the following illustrations shows the correct direction of the lines of force around a bar magnet?



40. The human sex cells are produced in the
- A. scrotum and uterus
 - B. testis and ovary
 - C. penis and vagina
 - D. scrotum and ovary

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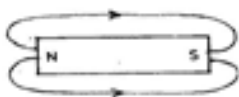
INTEGRATED SCIENCE 1

ANSWERS

OBJECTIVE TEST

1. D. soft
2. B. I and III only
3. D. vernier calipers
4. B. soil fertility
5. B. boiling
6. C. leaching
7. A. I only
8. B. lettuce
9. A. alveolus
10. B. carbon (IV) oxide
11. A. fowl
12. B. pollination in flowering plants
13. D. Million's reagent
14. D. I, II and III
15. D. terracing
16. D. Meteorological Services Department
17. D. monoculture
18. A. Jupiter
19. A. fertilization

20. D. transpiration
21. A. deep litter system
22. B. *n-p-n* transistor
23. C. more holes than electrons
24. B. oil
25. D. wood
26. B. III only
27. B. Pulmonary artery
28. C. chemical energy → electrical energy → light energy
29. B. mercury
30. D. proteins
31. B. incisor
32. B. fingerlings
33. B. I and II only
34. A. biological control method
35. C. 20 J
36. A. Mineral salts
37. C. 6
38. C. supply chain



39. B
40. B. testis and ovary

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INTEGRATED SCIENCE 2

1 ¼ hours

ESSAY

[100 marks]

This paper is in two parts, I and II

*Answer Question 1 in Part I and any other **four** questions in Part II.*

Credit will be given for clarity of expression and orderly presentation of material

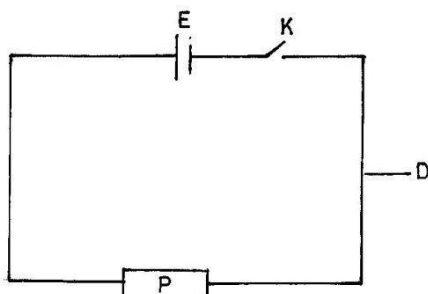
PART I

[40 marks]

*Answer **all** of Question 1*

1. (a) The diagram below is used to demonstrate an activity in the laboratory.

Study it carefully and use it to answer the questions that follow:



- (i) What does the diagram represent?
 - (ii) Identify the components labelled **D**, **E**, **K** and **P** in the diagram
 - (iii) State **one** function **each** of the parts labelled **D**, **E**, **K** and **P**.
 - (iv) Mention the energy transformation that occurs in **E** in the diagram when **K** is closed.
- [10 marks]
- (b) In an experiment, red and blue litmus papers were dipped separately into **three** test tubes each containing one of the test substances listed in the table below.

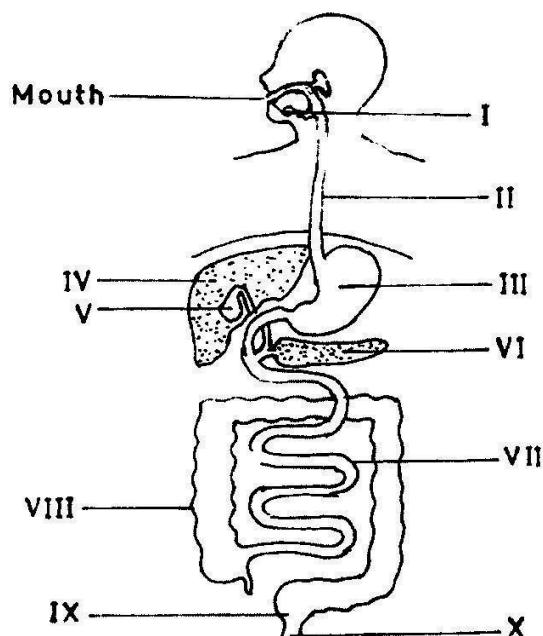
Test substances	Observations		Conclusion
	Red litmus paper	Blue litmus paper	
Lemon juice			

Calcium hydroxide solution			
Dilute hydrochloric acid			

- (i) Copy and complete the table by making the necessary **observation** and **conclusion** for **each** substance.
- (ii) Name **two** of the test substances that would react with each other to produce salt and water.
- (iii) Write down a balanced chemical equation for the reaction in (ii) above.

[10 marks]

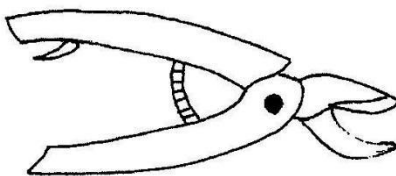
- (c) The diagram below is an illustration of the human digestive system.
Study it carefully and use it to answer the questions that follow:



- (i) Name the parts labelled **I**, **II**, **III** and **IV**
- (ii) State **one** function of **each** of the parts labelled **V** and **VI**
- (iii) Name the part where the digestion of protein starts.
- (iv) Identify the part where
- (α) absorption of end-products of digestion takes place
 - (β) re-absorption of water takes place
 - (γ) egestion takes place

[10 marks]

- (d) The diagram below is an illustration of a simple farm tool.
Study it carefully and use it to answer the questions that follow:



- (i) Identify the tool
- (ii) State **three** uses of the tool
- (iii) Mention **three** ways of maintaining the tool

[10 marks]

PART II

[60 marks]

Answer **four** questions **only** from this part.

2. (a) (i) What is *neutralization reaction*?
 (ii) Write a balanced chemical equation for the reaction between **each** of the following pairs of substances:
 (α) Sodium metal and dilute hydrochloric acid.
 (β) Sodium hydroxide and dilute hydrochloric acid
- [6 marks]
- (b) Explain *weaning* as used in animal production
- (c) (i) What is *milky way*?
 (ii) State **one** use of artificial satellites
- [2 marks]
[3 marks]
- (d) (i) What is a *habitat*?
 (ii) Give **two** examples of a habitat.
- [4 marks]
3. (a) (i) Define *pressure*.
 (ii) Explain why it is important to sharpen a knife before use
- [4 marks]
- (b) (i) State **two** differences between *metals* and *non-metals*
 (ii) What is an *alloy*?
 (iii) Mention the components of **each** of the following alloys:
 (α) steel
 (β) brass
- [6 marks]
- (c) Mention **three** conditions suitable for rearing tilapia in a fishpond
- [3 marks]
- (d) Explain how the streamlined body of a bony fish enables it to live successfully in water

- [2 marks]
4. (a) (i) What is a *disease vector*?
 (ii) Mention **two** methods of controlling **each** of the following types of pests of farm animals:
 (α) ectoparasites
 (β) endoparasites
- [6 marks]
- (b) (i) State **two** symptoms of nitrogen deficiency in a tomato plant.
 (ii) Describe *side dressing* as a method of fertilizer application.
- [5 marks]
- (c) (i) Define *power*
 (ii) State the S.I. unit of power.
- [2 marks]
- (d) Draw the electronic structure of sulphur
 {Atomic number of sulphur = 16}
- [2 marks]
5. (a) (i) What is *respiration*?
 (ii) Name the types of respiration that occur in humans
- [4 marks]
- (b) List **three** ways of maintaining soil fertility
- [3 marks]
- (c) (i) Write the systematic name of **each** of the following chemical compounds:
 (α) FeS;
 (β) SO₂
 (γ) CO₂
 (ii) Give **one** reason why copper, silver and gold are mostly used in making ornaments and jewellery.
- [4 marks]
- (d) (i) What is a *fuse*?
 (ii) Explain why a fuse is used in an electrical circuit.
- [4 marks]
6. (a) (i) What is the difference between *unicellular organism* and *multicellular organism*
 (ii) State two reasons why vegetable crops are important to humans
- [4 marks]
- (b) (i) State **two** elements of climate
 (ii) What is the difference between *climate* and *weather*?
- [4 marks]
- (c) Mention **three** advantages of staking in crop production
- [3 marks]

(d) Explain **each** of the following processes:

- (i) corrosion;
- (ii) sublimation

[4 marks]

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INTEGRATED SCIENCE 2

ANSWERS

ESSAY

1. (a) (i) An electrical circuit

(ii) **The components:**

- D - Conductor wire
- E - Cell or emf source
- K - Switch or key
- P - Resistor

(iii) **Function of**

- D - Electric current flows through it
Or it conducts electricity
- E - Provides the electromotive force (emf)
Or: provides the potential difference or voltage
Or: produces the electric current or electricity
Or: converts chemical energy to electrical energy
- K - Opens or closes the circuit
Or: stops or starts the flow of current through the circuit
- P - Opposes the flow of current through the circuit
Or: converts electrical energy to other forms

(iv) **energy transformation that occurs in E in the diagram when K**
Chemical energy → Electrical energy

(b) (i)

<i>Test substances</i>	<i>Observations</i>		<i>Conclusion</i>
	<i>Red litmus paper</i>	<i>Blue litmus paper</i>	
Lemon juice	Remains red or: no colour change	Turns red	Acidic substance or: Contains acid

Calcium hydroxide solution	Turns blue	Remains blue or: no colour change	Basic substance or: Contains base
Dilute hydrochloric acid	Remains red or: no colour change	Turns red	Acidic substance Contains acid

(ii) Reactants to form salt and water:

Calcium hydroxide solution and dilute hydrochloric acid

(iii) Balanced chemical equation:



(c) (i) The parts:

- I - salivary gland
- II - oesophagus
- III - stomach
- IV - liver **or:** gullet

(ii) Function of:

Part V - Stores bile **Or:** Concentrates bile

Part VI - Secretes juices containing enzymes into the small intestines
Or: secretes hormones such as insulin into the bloodstream

(iii) Digestion of protein starts at: Part III or The stomach

(iv) (α) absorption of end-products - Part VII - Small intestines

(β) re-absorption of water - Part VIII - Large intestines

(γ) egestion - Part X - Anus

(d) (i) The Tool - Secateurs or a pair of secateurs

(ii) Uses of the tool

- Trimming
- Cutting
- Pruning

(iii) Ways of maintaining the tool

- Oiling or greasing metal parts
- Washing and drying after use
- Tightening bolts and nuts when loose
- Sharpening cutting edges when blunt (any three)

2. (a) (i) Neutralization reaction

A chemical reaction between an acid and a base to produce salt and water

(ii) (α) Sodium metal and dilute hydrochloric acid.



(β) Sodium hydroxide and dilute hydrochloric acid



(b) Weaning

Starting to feed a young animal with food other than its mother's milk

(c) (i) Milky way

the spiral galaxy to which Earth and its solar system belong

(ii) Use of artificial satellites

- Weather studies and forecasting
- Telecommunication
- Sending and receiving TV signals
- Taking photographs from space for various purposes
- Internet networking
- Global Positioning System (GPS) - a worldwide navigation system

[any one of the above]

(d) (i) Habitat

The natural living place of a plant or animal

Or: The natural conditions and environment of an organism

(ii) Examples of habitat

Forest, desert, river or wetlands, tree, etc (any two)

3. (a) (i) **Pressure**

The force per unit area

Or: Pressure = force / area

- (ii) When a knife is sharpened, the area at the cutting edge is reduced; hence greater pressure is attained at a given applied force. Therefore it cuts easily with less applied force.

(b) (i)

METALS	NON-METALS
High melting point	Low melting point
Shiny surface	Dull surface
Malleable	Not malleable
Ductile	Not ductile
Good conductors of heat	Bad conductors of heat
Good conductors of electricity	Bad conductors of electricity

(ii) **Alloy**

A substance containing a metal and another metal or non-metal uniformly physically combined

Or: A homogeneous mixture of a metal and another metal or non-metal

(iii) (a) **Steel** - Iron and Carbon

(b) **brass** - Zinc and copper

(c) **Conditions suitable for rearing tilapia in a fishpond**

- Suitable salinity (salt concentration) of the pond
- Non-polluted water
- Favourable temperature of water
- Sufficient dissolved oxygen in the water
- Suitable pH of the water

(d) Importance of the streamlined body of a bony fish

Enables the fish to move smoothly or easily in the water

Or: it reduces the friction between the water molecules and the body of the fish.

4. (a) (i) Disease Vector

An organism that transmits disease-causing microorganisms from an infected person or animal to another

(ii) Methods of control

(α) ectoparasites

- Use of pesticides
- Dipping
- Dusting
- Handpicking
- Use of footbath
- Rotational grazing

(β) endoparasites

- Drenching
- Deworming
- Vaccination
- Regular change of feed and litter

(b) (i) Symptoms of nitrogen deficiency in a tomato plant

- Stunted growth
- Weak stem or branches
- Leaves turn yellowish
- Fruits are smaller and fewer than normal

(ii) Side dressing (fertilizer application)

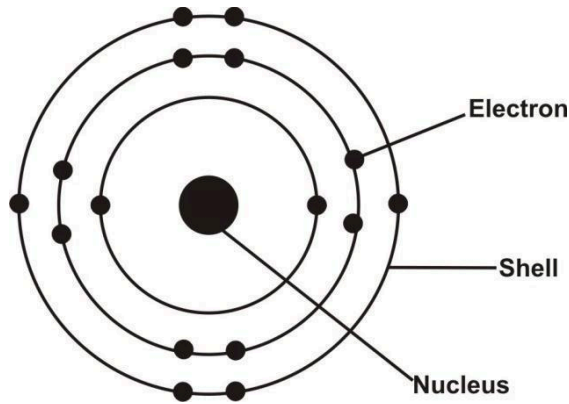
Applying the fertilizer on / in the ground at the sides of the crop

(c) (i) Power

The time rate of doing work **Or:** The work done per unit time
Or: $(\text{work done}) / (\text{time taken})$

(ii) **S.I. unit of power** = watt or W

(d) **The electronic structure of sulphur (atomic no. 16)**



5. (a) (i) **Respiration**

The breakdown of food substances in an organism to release energy, carbon dioxide, water

(ii) **Types of respiration**

External respiration and internal respiration

Or: Aerobic and anaerobic respiration

(b) **Ways of maintaining soil fertility**

- Crop rotation
- composting
- mulching
- Fertilizer application
- Bush fallowing
- Green manuring
- Planting of cover crops
- Mixed farming

(c) (i) Systematic names of:

- (α) FeS - Iron (II) sulphide
(β) SO₂ - Sulphur (IV) oxide
(γ) CO₂ - Carbon (IV) oxide

(ii) Reasons

They are very malleable, ductile, have high lustre and less reactive.

(d) (i) Fuse

An electrical safety device containing a piece of a metal that melts if the current running through it exceeds a particular level, thereby breaking the circuit.

(ii) Why fuse is used in an electrical circuit

To protect the electrical circuit from damage caused by abnormal power surges or increases

6. (a) (i)

Unicellular organism	Multicellular organism
organism is made up of only one cell	organism is made up of more than one cell

(ii) Why vegetable crops are important to humans

- Good source of vitamins
- Good source of mineral salts
- Make food tasty
- They have high fibre content

(b) (i) Elements of climate

- Rain
- Temperature
- Humidity
- Sunshine
- Atmospheric pressure
- Cloud

- Wind

(ii) Difference

Climate	Weather
atmospheric condition of a place over a long period of time	atmospheric condition of a place over a short period of time

(c) Advantages of *staking* in crop production

- Keeps fruits clean
- Enables easy weeding
- Enables easy harvesting
- Prevents early spoilage of fruits
- Keeps plant from falling during storms
- Keeps plant from falling under the weight of mature fruits

(d) (i) Corrosion explanation

A process by which a substance, especially a metal, is destroyed progressively by chemical action.

Example: the rusting of iron

(ii) Sublimation explanation

A process in which a substance is converted directly from a solid to a gas or from a gas to a solid without passing through the liquid state

Example: the conversion of naphthalene ball (camphor) from solid to gas directly

