

BEST BRAIN EXAMINATIONS KONSORTIUM
SPECIAL PRIVATE MOCK FOR BECE CANDIDATES – SEPTEMBER 2021
MARKING SCHEME – INTEGRATED SCIENCE

PAPER TWO

SECTION A [40 Marks]

QUESTION ONE**(a) (i) WHAT HAPPENS IN THE TEST TUBE**

Sodium Chloride dissolves in the water.

[2 marks]

(ii) DESCRIPTION OF SODIUM CHLORIDE IN THE DIAGRAMNaCl is soluble in water **OR:**NaCl dissolves in water

[2 marks]

(iii) WAYS OF INCREASING THE REACTION IN TEST TUBE

- By stirring
- By heating
- By breaking down the sodium chloride into smaller particles

[2 marks @ 1 mark each]

(iv) WHAT WILL HAPPEN IF MORE NaCl IS ADDED TO TEST TUBE

A Saturated Solution is formed/ it no more dissolves

OR: It does not dissolve any longer

[2 marks]

(v) DESCRIPTION OF HOW TO SEPARATE COMPONENTS OF THE SET-UP

Through evaporation, by heating the solution, water is separated from the mixture in the form of vapor leaving behind sodium chloride crystals.

[2 marks]

SUB-TOTAL = 10 MARKS

(b) (i) IDENTIFICATION OF TYPE OF CROP AND THE CLASS IT BELONGS.**NAME OF CROP:**

Beans / Cowpea

[1 mark]

CLASS IT BELONGS

Legume/ leguminous crop

[1 mark]

(ii) HOW CROP IS CULTIVATED

The crop is cultivated by sowing its Seeds.

[2 marks]

(iii) REASONS CROP IS IMPORTANT TO FARM SOIL

- It adds nitrogen to the soil.
- It helps control soil erosion.
- It helps improve soil structure.
- Retains soil water content of the soil
- Etc.

[3 marks @ 1 mark each]

(iv) NUTRITIONAL BENEFITS OF THE CRO

- Protein,
- Fiber,
- Folate,
- Iron
- Magnesium.

[3 marks @ 1 mark each]

SUB-TOTAL = 10 MARKS

- (c) (i) **THE MAGNETIC FORCE THAT WOULD EXIST BETWEEN THE TWO BARS**
Force of repulsion/Repulsive force. [2 marks]
- (ii) **WHY THE MAGNETIC FORCE WILL EXIST**
This is because like poles of magnets repel when brought near each other. [4 marks]
- (iii) **THE NAME OF THE POINT X**
Neutral point. [2 marks]
- (iv) **DESCRIBING A MAGNETIC FIELD**
Magnetic field is the area around a magnet where magnetic force or magnetic influence can be felt. [2 marks]

SUB-TOTAL = 10 MARKS

- (d) (i) **IDENTIFICATION OF CYCLES**
A - Life cycle of a flowering plant
B - Carbon cycle [2 marks]
- (ii) **IDENTIFICATION OF STAGES LABELED IN A**
I - Maturation
II - Fertilization
III - Seed/ fruit formation and maturation
IV - Dispersal of fruits and seeds [2 marks @ ½ mark each]
- (iii) **DESCRIPTION OF WHAT WOULD OCCUR AT EACH STAGE**
I - **Maturation:** This is the growth stage of flowering plants.
II - **Fertilization:** It is stage at which fusion of the female gamete, the ovum or egg and the male gamete produced in the pollen tube occurs.
III - **Seed/ fruit formation and maturation:** the stage at which ovules develop into seeds and ovaries develop into fruits.
IV - **Dispersal of fruits and seeds:** at this stage, several agents of fruits and seed dispersion helps to move fruits and seeds to new locations or areas. [2 marks @ ½ mark each]
- (iv) **IDENTIFICATION OF PROCESSES IN B**
V → Photosynthesis
VI → Respiration
VII → Respiration
VIII → Decomposition [2 marks @ ½ mark each]
- (v) **WAYS TO MAINTAIN THE CARBON CYCLE**
- Use of alternative fuels apart from fossil fuels.
- Planting more trees.
- Implementing sustainable greenhouse gas emission policies.
- Avoid burning of bushes. [2 marks @ 1 mark each]

SUB-TOTAL = 10 MARKS

TOTAL FOR SECTION A = 40 MARKS

QUESTION TWO

(a) (i)

FUNCTIONS OF THE STOMACH AS A DIGESTIVE ORGAN

- Stores food for further digestion
- Destroys microorganisms in food
- Produces digestive enzyme
- Produces hydrochloric acid to help in food digestion
- Churns/mixes food for proper digestion

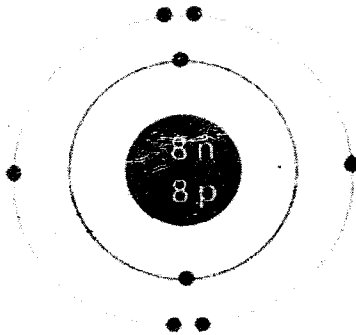
[2 marks @ ½ mark each]

(ii)

WAYS OF KEEPING THE STOMACH HEALTHY

- Eat food rich in fibre
- Eat on time
- Reduce alcohol intake
- Avoid taking too hot foods
- Avoid overeating
- Regular exercise
- Drinking adequate amounts of water
- Etc.

[2 marks @ 1 mark each]

(b) **ATOMIC STRUCTURE OF OXYGEN**

[4 marks]

(c) **WHY EGG SINKS IN WATER BUT FLOATS IN SALT SOLUTION**

Egg sinks in water because the density of egg is greater than the density of water. But the density of egg is less than density of salt solution which makes it possible to float in salt solution.

[3 marks]

(d) **DIFFERENCES BETWEEN CLAY AND SAND**

Clay soil	Sandy soil
The proportion of fine particle is higher.	The proportion of large particles is higher.
Particles are packed tightly.	Particles are loosely packed.
It can hold good amount of water.	Its ability to retain water is low.
Water cannot drain quickly.	Water can drain quickly.
It is rich in humus.	It is not rich in humus.

[4 marks @ 1 mark each]

TOTAL = 15 MARKS

QUESTION THREE**(a) IMPORTANCE OF THE FOLLOWING IN HOUSEHOLD WIRING.**

- (i) **FUSE:** It is a form of wire which cut off or break off when the current is excessively high and thus prevents damage to the electrical appliances. [2 marks]
- (ii) **EARTHING:** This is a wire provided so that in the event of electrical leakage in metal the leakage is directed into the ground. [2 marks]

(b) DESCRIPTION OF POLLINATION IN AN INSECT-POLLINATED FLOWER

- An insect lands on the petals of the flower and its weight presses them.
- The tip of the (keel) petal open exposing the anther with the pollen grains oozing out.
- In the act of sucking nectar from the base of the (standard) petal with its long proboscis, the body of the insect touches the anthers and picks up some pollen grains.
- The insect then flies away with the body dusted with pollen grains.
- When the insect visits another flower with mature stigma, the pollen grains on its body are brushed off onto the stigma.

[3 marks]

(c) (i) USES OF THE HOE AS A FARMING TOOL

- Weeding
- Preparing mounds
- Preparing beds
- Uprooting stumps
- Digging the ground

[2 marks @ 1 mark each]

(ii) COMMON FARMING TOOLS

- Cutlass
- Hand trowel
- Pickaxe
- Watering can
- Secateurs
- Digging mattock
- Sickie
- Digging fork
- Rake
- Pruning saw
- Shears
- Hand fork
- etc.

[2 marks @ 1 mark each]

(d) (i) DIFFERENCES BETWEEN CONDENSATION AND SUBLIMATION

Condensation	Sublimation
Vapour changes to liquid	Solid changes into gas or vice-versa
Liquid state involve.	Liquid state not involved

[2 marks @ 1 mark each]

(ii) FACTORS WHICH AFFECT THE RATE OF EVAPORATION OF A LIQUID

- Atmospheric pressure
- Surface area
- Temperature
- Density of liquid
- Speed of wind
- Humidity
- Etc.

[2 marks @ 1 mark each]

TOTAL = 15 MARKS

QUESTION FOUR

(a) (i) **BASE:** It is any substance that gives hydroxide ions (OH^-) when dissolved in water.

[2 marks]

(ii) **PROPERTIES OF BASES**

- Bitter taste
- Change red litmus paper to blue
- Corrosive when concentrated
- PH is greater than 7
- Feel slippery or soapy
- React with acids to produce salt and water

[2 marks @ 1 mark each]

(b) **USES OF PROTEIN IN THE HUMAN BODY**

- Repair and maintenance of body tissues
- May be used to generate energy
- Creation of hormones
- Making enzymes
- Transportation of important molecules
- Used as antibodies to fight infections

[3 marks @ 1 mark each]

(c) **INDUSTRIAL PRODUCTS OF THESE AGRICULTURAL RAW MATERIALS**

(i) Cocoa beans: Cocoa butter, Chocolate

1 each x 2 = 2 marks

(ii) Palm oil: Margarine, Ice cream, Peanut butter, Snacks and Cookies

1 each x 2 = 2 marks

(d) (i) **PROPERTIES OF MAGNETS**

- Aligns to the earth's magnetic north and south pole when suspended
- Have two poles namely north and south poles
- Opposite poles attract while like poles repel
- They attract magnetic materials

[1 each x 2 = 2 marks]

(ii) **WAYS OF DEMAGNETIZING ANY OF THE MAGNETS**

- Heating it into red hot and allowing it to cool while lying in an east-west direction.
- Hammering it
- Dropping it repeatedly
- Placing it in a solenoid and allowing alternating current (a. c) to flow through.

[1 each x 2 = 2 marks]

TOTAL = 15 MARKS**QUESTION FIVE**(a) **METHODS OF CONTROLLING MOSQUITOES**(i) **PUPAL STAGE**

- Introducing predators or fishes into stagnant or pond water
- Use of biological methods or control
- Pouring of oil or kerosene on surface of the water
- Draining of stagnant water
- Etc.

[1 each x 2 = 2 marks]

(ii) **ADULT MOSQUITOES**

- Spray with or use of insecticides to kill adult mosquito
- Use of mosquito coil
- Clearing of weeds or bushes around houses
- Use of special electric bulbs
- Use of special paints or Inesfly
- Use of treated mosquito net.
- Etc.

[1 each x 2 = 2 marks]

(b) (i) **EXPLAINING A P-N JUNCTION DIODE**

A device which offers low resistance to electric current in one direction and a very high resistance in the opposite direction. It is formed by combining N – type and P – type semiconductor. The region where they meet is the p – n junction.

[2 marks]

(ii) **EXPLANATION OF FORWARD BIAS AND REVERSE BIAS*****Forward Bias***

Forward bias occurs when the p – type side of a p – n junction diode is connected to the positive terminal of a battery and the n – type to the negative terminal of a battery.

Reverse Bias

When the negative terminal of the battery is connected to the p – type side of junction and positive terminal to the n – type side of the junction.

[1 each x 2 = 2 marks]

(c) (i) **HARMFUL EFFECTS OF WEEVILS**

- It destroys grains
- It destroys beans
- It brings about shortage of grains for the next planting season
- It causes low yield.
- It leads to losses to the farmer.

[2 marks @ 1 mark each]

(ii) **METHODS OF CONTROLLING WEEVILS**

- Spraying with chemicals such as pesticide on harvested crops
- Hand picking
- Cultural control that has to do with sanitation

[2 marks @ 1 mark each]

(d) (i) **SATURATED SOLUTION**

A saturated solution contains as much of the solute as is possible under a particular temperature.
OR: A solution that cannot take any more of the solute at that temperature.

[1 mark]

(ii) **HOW SATURATED SALT SOLUTION IS PREPARED**

- Measure a quantity of liquid / water
- Add small quantity of salt
- Stir till salt dissolves
- Repeat adding and stirring till no more salt can dissolve

[2 marks]

QUESTION SIX(a) (i) **ORGANISMS WHICH CAUSE CROP DISEASES**

- Fungi or correctly named fungus
- Bacteria
- Viruses
- Nematodes

[2 marks @ 1 mark each]

(ii) **METHODS OF TRANSMISSION OF CROP DISEASES**

- Wind
- Water
- Physical contact
- Planting materials
- Soil insect or birds or animals
- Farm tools or equipment
- Farm workers
- Etc.

[1 each x 2 = 2 marks]

(b) **HARMFUL EFFECTS SMOKING ON HUMANS**

- Narrowing of the blood vessels which leads to heart attack
- Lung cancer
- Miscarriage in pregnant women
- Raise blood pressure
- Catarrh
- Stroke
- Stained teeth
- Madness
- Heart diseases
- Bad breath
- Bronchitis

[3 marks @ 1 mark each]

(c) **HARMFUL EFFECTS OF AIR POLLUTANTS**

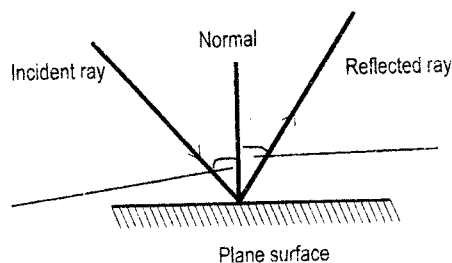
- It causes acidic rain which causes corrosion, kills plants and aquatic organisms.
- Inhaling of smoke and dust may cause respiratory diseases such as catarrh, lung cancer, asthma, etc.
- Smoke from forest fires affects visibility and may cause road accidents.
- It causes rise in temperature of the atmosphere leading to climate change.
- Dust particles settle on leaves of plants and cut off light supply – this prevents photosynthesis and kills plants.
- Some air pollutants are poisonous to plants and animals.
- Acid rain causes leaching of soil nutrients.
- Etc.

[3 marks @ 1 mark each]

(d) (i) **LAWS OF REFLECTION**

- The incident ray, the reflected ray and the normal at the point of incidence all lie in the same plane
- The angle of incidence is equal to the angle of reflection

[1 each x 2 = 2 marks]

(ii) **DIAGRAM TO SHOW REFLECTION OF LIGHT IN A PLANE MIRROR**

Correct drawing = 2 marks
 2 or more labels correct $\frac{1}{2} \times 2 = 1$ marks

TOTAL FOR PART II = 60 MARKS

THUS TOTAL FOR PAPER 2 = (PART I + PART II) = 100 MARKS

PAPER I [40 MARKS]

1. C	11. C	21. C	31. C
2. B	12. B	22. C	32. D
3. B	13. A	23. B	33. B
4. C	14. B	24. B	34. B
5. C	15. D	25. A	35. C
6. C	16. C	26. B	36. D
7. A	17. C	27. A	37. D
8. D	18. C	28. A	38. B
9. B	19. A	29. C	39. D
10. C	20. D	30. A	40. D

GRAND TOTAL = PAPER 1 (40) + PAPER 2 (100) = 140 MARKS

OVERALL SCORE = $\frac{\text{TOTAL SCORE}}{140} \times 100$

140