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Analysis of Pupil Performance

ENVIRONMENTAL SCIENCE



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This document of the Analysis of Pupils' Performance at the ISC Year 12 and ICSE Year 10 Examination is one of its kind. It has grown and evolved over the years to provide feedback to schools in terms of the strengths and weaknesses of the candidates in handling the examinations.

We commend the work of Mrs. Shilpi Gupta (Deputy Head) and the Research Development and Consultancy Division (RDCD) of the Council who have painstakingly prepared this analysis. We are grateful to the examiners who have contributed through their comments on the performance of the candidates under examination as well as for their suggestions to teachers and students for the effective transaction of the syllabus.

We hope the schools will find this document useful. We invite comments from schools on its utility and quality.

November 2020

**Gerry Arathoon
Chief Executive & Secretary**

The CISCE has been involved in the preparation of the ICSE and ISC Analysis of Pupil Performance documents since the year 1994. Over these years, these documents have facilitated the teaching-learning process by providing subject/ paper wise feedback to teachers regarding performance of students at the ICSE and ISC Examinations. With the aim of ensuring wider accessibility to all stakeholders, from the year 2014, the ICSE and the ISC documents have been made available on the CISCE website www.cisce.org.

The documents for the ICSE and ISC Examination Year 2020 include a detailed qualitative analysis of the performance of students in different subjects. The purpose of this analysis is to provide insights into how candidates have performed in individual questions set in the question paper. This section is based on inputs provided by examiners from examination centers across the country. It comprises of question wise feedback on the performance of candidates in the form of *Comments of Examiners* on the common errors made by candidates along with *Suggestions for Teachers* to rectify/ reduce these errors. The *Marking Scheme* for each question has also been provided to help teachers understand the criteria used for marking. Topics in the question paper that were generally found to be difficult or confusing by candidates, have also been listed down, along with general suggestions for candidates on how to prepare for the examination/ perform better in the examination.

The Analysis of Pupil Performance document for ICSE for the Examination Year 2020 covers the following subjects/papers: English (English Language, Literature in English), History and Civics, Mathematics, Physics, Chemistry, Commercial Studies and Environmental Science.

Subjects covered in the ISC Analysis of Pupil Performance document for the Year 2020 include English (English Language and Literature in English), Hindi, Physics, Chemistry, Mathematics, Computer Science, History, Political Science, Economics, Commerce, Accounts, and Environmental Science.

I would like to acknowledge the contribution of all the ICSE and the ISC examiners who have been an integral part of this exercise, whose valuable inputs have helped put this document together.

I would also like to thank the RDCD team of Dr. M.K. Gandhi, Dr. Manika Sharma, Mrs. Roshni George and Ms. Mansi Guleria, who have done a commendable job in preparing this document.

We hope that this document will enable teachers to guide their students more effectively and comprehensively so that students prepare for the ICSE/ ISC Examinations, with a better understanding of what is required from them.

November 2020

Shilpi Gupta
Deputy Head - RDCD

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SECTION A (40 Marks)

Attempt all questions from this Section

Question 1

- (a) What are bio pesticides? Give one example of a bio pesticide. [2]
- (b) What are biosphere reserves? [2]
- (c) List any two problems that waste can cause to our environment. [2]
- (d) Explain the working of Remote Sensing Satellites. [2]
- (e) What is the impact of increasing population on the land? [2]

Comments of Examiners

- (a) Many candidates answered the first part of the question correctly but did not give an example of a bio-pesticide or gave an incorrect example. Some also wrote examples of bio-fertilizers instead of bio pesticides.
- (b) Many candidates did not write the meaning of the term correctly. Most of the candidates gave an explanation which was incomplete. In some cases, examples were given without proper definition or explanation.
- (c) Most candidates answered this question correctly but some of the points were not specific. A few candidates wrote the methods of disposal of waste.
- (d) Most of the candidates did not answer this subpart correctly. They wrote about its uses instead of the working. Some candidates wrote what a remote sensing satellite is.
- (e) Most candidates answered this question correctly though some examples were irrelevant. Some candidates wrote about different types of pollution such as air, water, and soil, instead of the impact of increasing population on the land.

Suggestions for Teachers

- *Emphasise the difference between pesticide and fertilizer with examples of each.*
- *Explain in comparative format the difference between bio pesticide and bio fertilizers.*
- *Teach the concept of biosphere reserves with relevant examples.*
- *Ask students to list the different types of waste generated in their house and find a solution to dispose of the waste without causing any problem to the environment.*
- *Advise students to read and understand the question before attempting to write the answer.*
- *Explain in detail the definition, working, advantages and application of remote sensing satellites.*
- *Reinforce learning by frequently questioning students in different ways on the concepts taught.*
- *Develop reasoning skills of students to enable them to answer application-based questions.*

MARKING SCHEME

Question 1

(a)	Bio pesticides are biological agents used for control of weeds, insects and pathogens. Example: Bacillus thuringiensis, spider, frog, snake, ducks, etc.
(b)	Biosphere reserves are protected areas of land or coastal environment that aims at in-situ conservation of ecosystems and genetic resources. Land use is permitted by designating various zones, they are the core zone of no human activity, buffer zone of limited human activities and transition zone of active cooperation between management and local people.
(c)	Two problems that waste can cause in our environment are: <ul style="list-style-type: none">- Responsible for spoiling landscape- Creates water, soil, and air pollution- Breeding ground for disease- Home for insects and rodents- Accumulated junk and garbage is prone to catch fire. <p style="text-align: right;"><i>(Any two points)</i></p>
(d)	Remote Sensing Satellites have sensors that give two-dimensional information that is either a photographic image or an array of digital data of the earth.
(e)	Impact of increasing population on the land: <ul style="list-style-type: none">- Forests and grasslands are cleared.- Poor land management often leads to degradation of land.- Clearing of forests and grassland leads to loss of habitat for wildlife and loss of biodiversity.- Ecological imbalance in nature- Leads to soil erosion, pollution of air, water, and land. <p style="text-align: right;"><i>(Any two points)</i></p>

Question 2

- (a) List two aims of MNC's. [2]
- (b) How has LPG benefitted the rural areas of India? [2]
- (c) What are organic fertilizers? Give any one disadvantage of organic fertilizers. [2]
- (d) Name any two clean fuels. [2]
- (e) How can the government encourage child education? [2]

Comments of Examiners	Suggestions for Teachers
<p>(a) Most of the candidates did not mention the aims of MNC's and wrote about the benefits of MNC's for the host country or defined MNC's. Some gave only one aim instead of two, as required.</p> <p>(b) Majority of the candidates attempted this question correctly. Some candidates wrote about the general benefits of LPG but not its specific benefits in rural areas. A few were confused between <i>rural</i> and <i>urban</i> areas.</p> <p>(c) Many candidates were unable to define organic fertilizers satisfactorily. Some candidates gave the advantages of organic fertilizers instead of their disadvantages. Many gave the definition of <i>pesticides</i> instead of <i>fertilizers</i>.</p> <p>(d) Many candidates wrote 'Petrol' as a clean fuel, which was not accepted. Some children were confused between clean fuels and polluting fuels.</p> <p>(e) The question was attempted by almost all the candidates on a generalised basis. Most of the candidates wrote only about awareness spread by the government but not specific points like <i>setting schools, supplying books, etc.</i> Some of the candidates misunderstood this question and wrote on providing education to the girl child. A few candidates wrote that the government must make education compulsory.</p>	<ul style="list-style-type: none"> ▪ <i>Clarify to the students the aims of MNC's in point format.</i> ▪ <i>Discuss in detail the energy resources that benefit the rural and urban areas.</i> ▪ <i>Teach students about clean fuels along with the advantages and disadvantages.</i> ▪ <i>Stress upon the difference between pesticide and fertilizer. Give written assignments to students on any one topic where they mention the definition, advantages, and disadvantages.</i> ▪ <i>Explain the difference between fossil fuels, alternate fuels and clean fuels and give examples for each. Discuss about different clean fuels available in rural and urban areas.</i> ▪ <i>Familiarise students with government initiatives to encourage education for children in detail.</i>

MARKING SCHEME

Question 2

(a)	<p>The primary objectives of the MNC's are:</p> <ul style="list-style-type: none"> - To maximize profits by exploiting the resources and pay very little attention to the environment. - Expand the business to multiple countries. - Minimise the cost of production, especially labour cost. - To capture the lucrative foreign market against international competition.
(b)	<p>LPG has helped the rural areas of India:</p> <ul style="list-style-type: none"> - Available at an affordable price

	<ul style="list-style-type: none"> - Good substitute for polluting fuels e.g. Fuel wood - LPG is a clean fuel - Saves cooking time - They do not have to collect and accumulate firewood - It can be easily transported to rural areas.
(c)	<p>Organic fertilizers are derived from animal matter, excreta, human excreta and vegetable matter. It includes animal waste from meat processing, peat, manure, slurry etc.</p> <p>One disadvantage of organic manure is:</p> <ul style="list-style-type: none"> - More labour is required. - They are voluminous and bulky. - Their storage and transportation is difficult. - Supplies only a limited amount of nutrients.
(d)	<p>Two clean fuels are:</p> <p>CNG, Biodiesel, Hydrogen, Methanol, alcohol and ethanol. <i>(Any two)</i></p>
(e)	<p>The government can help to encourage education for children in the following ways:</p> <ul style="list-style-type: none"> - Set up schools near villages. - Appoint trained teachers and supporting staff. - Supply free books, uniforms and basic school requirements. - Have a mid-day meal program. - Give incentives to both staff and students for regular attendance. - Organise free pick up system for children who stay at a distance. <i>(Any two points)</i>

Question 3

- (a) State any two reasons for fossil fuel depletion. [2]
- (b) Why is it important for hospitals to reduce their solid waste? [2]
- (c) What do you understand by the term ‘debt trap’? [2]
- (d) What is the need for biotechnology in agriculture? [2]
- (e) Define reforestation. [2]

Comments of Examiners

- (a) Most candidates stated the two reasons for fossil fuel depletion correctly. Some candidates, however, wrote about the disadvantages of fossil

Suggestions for Teachers

- Discuss thoroughly the renewable and non-renewable energy resources with examples of each.

- fuel. A few gave examples of fossil fuels instead of reasons for their depletion.
- (b) Many candidates wrote about reducing waste with reference to 'Urbanization' rather than writing with regards to 'Waste Management'. Majority of the candidates wrote about the problems related to general waste but did not give specific answers, with respect to hospital waste. Some candidates were confused with this question. Instead of giving the importance of reducing solid waste the candidates gave methods of reducing hospital waste or different types of solid waste produced by hospitals.
 - (c) The meaning of the term 'Debt Trap' was not well written by many candidates.
 - (d) Some candidates wrote the definition of *biotechnology* instead of writing the need for biotechnology in agriculture. Several candidates, wrote about organic farming / the importance of fertilizers in agriculture / the names of modern agricultural practices.
 - (e) Many candidates did not mention the affix 're'-restoring, regrowing / regenerating of trees on lands where the trees were there before but were cut. They simply wrote growing of trees which did not convey the meaning of 'Reforestation". Most candidates incorrectly wrote *afforestation* instead of *reforestation*.
- *Develop reasoning skills of students to enable them to answer application-based questions.*
 - *Explain giving examples from daily life activities, the reasons for depletion of fuels. Also discuss the solutions.*
 - *Reinforce the learning by frequently questioning students in different ways on the concepts taught.*
 - *Show a video clipping of a hospital and then ask students to list down the waste generated there. Discuss ways to dispose the waste generated.*
 - *Discuss the effect of accumulation of hospital waste and how harmful it is.*
 - *Clarify the concept of 'debt trap' with the help of examples.*
 - *Explain thoroughly the definition and importance of biotechnology, its need in agriculture with advantages and disadvantages in agriculture.*
 - *Point out the difference between the terms Afforestation, Reforestation and Deforestation.*

MARKING SCHEME

Question 3

(a)	<p>Two reasons for fossil fuel depletion:</p> <ul style="list-style-type: none"> - Due to population growth, more demand for fossil fuel - It is a non-renewable resource - Once depleted it takes years to form - For many decades it is used to generate electricity - Increase in the number of vehicles - Industrial revolution <p style="text-align: right;"><i>(Any two points)</i></p>
(b)	<p>Hospitals need to reduce their solid waste:</p> <ul style="list-style-type: none"> - They generate the maximum amount of solid waste.

	<ul style="list-style-type: none"> - They are mostly single use products. - It can spread disease. - It can impact the water supply, wildlife, and the reputation of the hospital. - Creates a worker safe and environmentally safe workplace. (Any two points)
(c)	Debt trap is a situation where a new debt is added in order to pay an existing debt. This is an incentive structure that lures individuals into accepting long term debt obligations under conditions that strongly favour the lender. Developing countries are often caught in a debt trap. To repay their debts they are fast depleting their natural resources.
(d)	<p>Biotechnology in agriculture is a collection of scientific techniques used to improve plants.</p> <ul style="list-style-type: none"> - To increase agricultural productivity, it helps farmers to increase their farm yield - Lower production cost - It is safe and contributes both to environment and economic growth - To enhance product quality - To increase salt tolerance in plants. (Any two points)
(e)	<p>The term reforestation is a process of restoring and regenerating areas of woodland or forest that may have existed long ago but were deforested or otherwise removed at some point in the past.</p> <p>OR</p> <p>The process of replanting an area with trees.</p>

Question 4

- (a) State the difference of a core and buffer zone in a tiger reserved area. [2]
- (b) What is the link between growing population and environment degradation? [2]
- (c) What are bunds? How do they reduce soil erosion? [2]
- (d) How has construction work contributed to degradation of the environment? [2]
- (e) Mention any two ways by which industrial pollution can be controlled. [2]

Comments of Examiners

- (a) Majority of the candidates did not differentiate between core zones and buffer zones in a tiger reserve area. A few candidates wrote incompatible points of differentiation. Many candidates just wrote the definitions of *core zone* and *buffer zone*.

Suggestions for Teachers

- Clarify the differences between core zone and buffer zone in tiger reserves.
- Discuss various environmental issues and their relation with population growth, in detail.

- (b) Majority of the candidates answered this part correctly. Some candidates wrote about environmental degradation instead of its link to population growth.
- (c) Most candidates were unable to give the definition of 'bunds'. In a few cases, the term '**bunds**' was mistaken as *earthen dam*. Many candidates were able to explain how bunds help to reduce soil erosion. Some candidates repeated that bunds reduce soil erosion which was simply rewriting the question.
- (d) The question was well attempted by almost all candidates.
- (e) The question was answered correctly by most candidates. Some candidates made spelling mistakes in naming the devices used to control pollution in industries. A few candidates wrote about control measures to be taken for *vehicular pollution* instead of *industrial pollution*.
- *Explain different methods to control soil erosion by showing PowerPoint presentations and video clippings.*
 - *Teach students the definition of bunds and explain how bunds help reduce soil erosion.*
 - *Show students a video of construction sites for better understanding. Discuss how these degrade the environment.*
 - *Emphasise the advantages and disadvantages of construction activities. Make students aware of the impact of various man-made activities on the environment.*
 - *Advise students to read the questions carefully and answer specifically with reference to what has been asked.*
 - *Teach students about industrial pollution and different methods to control it.*
 - *Conduct a field study where students can observe different pollution controlling devices.*

MARKING SCHEME

Question 4

(a)	In a Tiger Reserve, the core zone is a legally protected central zone which remains undisturbed by any kind of human activity. The buffer zone which lies outside the core zone is used for education and research activities.
(b)	When human population increases beyond certain limits it is disadvantageous. The demand for all resources is increasing There is a loss of biodiversity, air and water pollution and increased pressure on arable land.
(c)	Bunds are earthen barriers with slopes in agricultural lands, made of stone or soil or even crop remains. They reduce soil erosion by: <ul style="list-style-type: none"> - Reducing runoff along contour lines. - Increasing water infiltration.
(d)	Construction work has contributed to the degradation of the environment <ul style="list-style-type: none"> - It has caused physical disruption

	<ul style="list-style-type: none"> - Loss of forest wood - Loss of agricultural land - Loss of fossil fuels - Pollution (Air, noise) - Depletion of renewable resources - Excessive consumption of energy - Increase in travel time <p style="text-align: right;"><i>(Any two points)</i></p>
(e)	<p>Two ways to control industrial pollution:</p> <ul style="list-style-type: none"> - Construction of very tall chimneys - Efficient devices and clean technology - Use of alternative fuels - Zoning - Use of pollution control devices - Planting trees - Meteorological control <p style="text-align: right;"><i>(Any two points)</i></p>

SECTION B (40 Marks)

Answer any four questions from this Section

Question 5

- (a) Define soil erosion. Explain any two man made and any two natural causes for soil erosion. [5]
- (b) What is biodiversity? Explain four reasons for loss of it in recent times. [5]

Comments of Examiners	Suggestions for Teachers
<p>(a) Most of the candidates attempted this question well. In the definition of soil erosion, many candidates did not mention <i>topsoil</i> or <i>agents of erosion</i>. Some candidates were able to write man made activities but under natural activities, they did not give relevant points. Many just listed the causes for soil erosion without explanation.</p> <p>(b) While many candidates did not write the correct definition of <i>Biodiversity</i>, the four reasons cited were correct. Several candidates listed the</p>	<ul style="list-style-type: none"> ▪ Give a clear understanding of terms such as, soil erosion and biodiversity. ▪ Explain the man made and natural causes for soil erosion in detail. ▪ Discuss in detail the concept of Biodiversity, why it is essential for the environment, threats to

reasons for the loss of biodiversity without any explanation.

Biodiversity and conservation strategies to maintain biodiversity.

- *Advise students to list the reasons for loss of biodiversity with explanation of each.*

MARKING SCHEME

Question 5

- | | |
|-----|--|
| (a) | <p>Soil erosion is the removal of the top fertile soil due to agents like rain, wind, and human activities.</p> <p>Manmade causes are:</p> <ul style="list-style-type: none">- Deforestation- Overgrazing- Wrong agricultural practices- Overuse of land for growing crops- Use of chemical fertilizers and pesticides- Mining activities <p>Natural causes are:</p> <ul style="list-style-type: none">- Gully erosion movement of snow and glaciers- Movement of rivers along the banks- Runoff of rainwater on hill slopes- Movement of wind- Floods <p style="text-align: right;"><i>(Any two)</i></p> |
| (b) | <p>The term biodiversity is the variety of flora and fauna giving rise to the large qualitative and quantitative differences in living organisms.</p> <p>Three reasons for loss of biodiversity in recent times:</p> <ul style="list-style-type: none">- Over population- Over use of resources- Loss of habitat- Hunting and poaching- Pollution- Demand of land use increasing- Climate change- Man, as a super consumer <p style="text-align: right;"><i>(Any four)</i></p> |

Question 6

- (a) Define incineration. Write any two advantages and any two disadvantages of incineration. [5]
- (b) What do you understand by international trade? [5]
List four benefits from international trade.

Comments of Examiners	Suggestions for Teachers
<p>(a) Majority of the candidates did not define <i>incineration</i> correctly. Only a few candidates included the term 'at a very high temperature' in the definition. A large number of candidates wrote the advantages and disadvantages correctly.</p> <p>(b) A few candidates did not understand the term <i>international trade</i> as they confused it with <i>national trade</i>. Some candidates only wrote about exchange of <i>goods</i>, they did not mention <i>services</i> or <i>capital</i>. Many candidates were unable to write four different points of benefits of international trade.</p>	<ul style="list-style-type: none"> ▪ Advise students to comprehend the definitions / technical terms and then learn. ▪ Stress on key words being included in the definition. Discuss in detail the advantages and disadvantages of the waste disposal methods. ▪ Explain 'incineration' with the help of video clippings to clear the concept. ▪ Discuss the concept of international trade and its benefits with examples. ▪ Ensure that the scope of the syllabus is referred to for all the topics mentioned therein while explaining to students.

MARKING SCHEME

Question 6

- (a) Incinerators are specially constructed, closed furnaces in which waste is burnt at very high temperatures so that complete combustion of waste is possible. This process is called incineration.
- Advantages of incineration:
- Saves a lot of money on transport
 - Reduces volumes of solid waste at one time
 - Burnt waste can generate energy (Any two)
- Disadvantages of incineration:
- Cost of the plant is expensive
 - Causes environmental pollution
 - Destroys recyclable material (Any two)

(b)	<p>International Trade is the exchange of goods, services and capital between countries and regions.</p> <p>Benefits:</p> <ul style="list-style-type: none"> - Trade may encourage production activities to shift from places where the environment is less sustainable. - Raises the living standards of people. Trade affects world production and consumption. - Trade influences the process of economic development, creating fresh opportunities for the profitable use of productive resources. - Promotes information exchange which leads to better cultural understanding of different people. - Trade helps in forming a more united world, countries no longer operate in isolation. - Trade raises the purchasing power of some nations. (Any four points)
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Question 7

- (a) What is urbanization? How can the government help to facilitate a better lifestyle to urban areas? [5]
- (b) Mention any two threats faced by Taj Mahal monument. State any three steps that can be taken to reduce its degradation. [5]

Comments of Examiners	Suggestions for Teachers
<p>(a) Majority of the candidates expressed a general view; they did not mention <i>migration</i> or <i>better standard of life</i> while defining urbanization. They also had difficulty in giving four points on how the government could help to facilitate a better lifestyle in urban areas.</p> <p>(b) Majority of the candidates, instead of writing the threats faced by the Taj Mahal monument, emphasised on the control measures. In response to the second part of the question, some candidates gave three steps to reduce degradation of the Taj Mahal, instead of two as asked in the question.</p>	<ul style="list-style-type: none"> ▪ <i>Spend sufficient time to explain all the things that can be done by the government to facilitate a better lifestyle in urban areas. Include points from different categories such as, shelter, sanitation, transport, etc.</i> ▪ <i>Discuss the term, 'urbanization', then ask simple questions related to the problems, positive and negative impacts of urbanization, etc.</i> ▪ <i>Involve students in brief interactive discussions on ways to reduce negative impacts of urbanization.</i> ▪ <i>Discuss reasons for protecting our heritage sites.</i> ▪ <i>Conduct comparative study on The Taj Mahal - Then and Now, giving application-based questions in the class on a regular basis.</i>

MARKING SCHEME

Question 7

- (a) The migration of people from rural areas to urban areas in search of jobs and better living standards resulting in concentration of population in cities is known as urbanization.

The government must help to facilitate:

- A better lifestyle
- Build houses at low rates
- Use the land efficiently
- It must supply sufficient energy to urban areas
- Well developed public transport system
- Proper water supply
- Education facilities
- Job opportunities

(Any four points)

- (b) **The threats faced by the Taj Mahal Monument are:**

- It is surrounded by 512 industries that give out gaseous pollutants that is affecting the Taj Mahal
- The Mathura oil refinery located close to Agra is a major source of SO₂ affecting the marble of the Taj Mahal
- The refinery, foundries and pit furnaces are all found to be major sources of pollution.

Steps that can be taken to reduce its degradation are:

- Use of low sulphur fuel oils in its furnaces and boilers
- To relocate the industries
- Creation of a green belt area around the Taj Mahal
- Install instruments for emission control and monitoring device.

Question 8

- (a) Write a note on women centered human development as a strategy for controlling the population growth. [5]
- (b) When and where was the UN's International conference on Population and Development held? Explain any three objectives. [5]

Comments of Examiners	Suggestions for Teachers
<p>(a) Majority of the candidates were unable to establish the problems related to women and how they could be addressed. Many candidates could not give all the points about women-centric programs to help in population control. They did not highlight the contribution of women in human development and population control.</p> <p>(b) Some candidates attempted this question, but they did not know the 'When' and 'Where' part of this question. Several candidates mentioned an incorrect date. The objectives were also not clearly mentioned.</p>	<ul style="list-style-type: none"> ▪ <i>Explain women empowerment giving examples for better understanding. Encourage students to elaborate on points while answering subjective questions.</i> ▪ <i>Advise students to be specific in mentioning 'when' and 'where' conferences were held and explain all objectives well. Revise frequently the highlights on 'year' and 'place' of events.</i>

MARKING SCHEME

Question 8

(a)	<p>Women centred human development:</p> <ul style="list-style-type: none"> - Women need to be counselled on the reproductive processes and the pros and cons of various contraceptive techniques to avoid unwanted pregnancies. - Education of girls is important as it removes age old superstitions. - It gives them an understanding of childcare. - Education also opens opportunities for them to work and follow their goals. - This leaves little scope for bearing and rearing of children. - They marry late have fewer healthy children. - This automatically drops the fertility rate.
(b)	<p>The UN's International Conference on Population and Development was held in Cairo, Egypt in September 1994.</p> <p>Its objectives were:</p> <ul style="list-style-type: none"> - Universal education: Primary education in all countries by 2015. To provide greater access to women for secondary and higher education as well as vocational and technical training. - Reduction in infant and child mortality: Countries should strive to reduce mortality rates by one third by the year 2000 and by 2015, the target rate should be below 35 per 1000 infants and below 45 per 1000 for children under 5 years. - Reduction in maternal mortality: Disparities in maternal mortality within countries and between geographical regions, socio economic and ethnic groups should be narrowed. - Access to reproductive and sexual health services including family planning: Family planning counselling, safe delivery, treatment for infertility, etc. must be made available.

Question 9

- (a) What is Agro forestry? Discuss any four objectives of Agro forestry. [5]
- (b) What is sustainable agriculture? Explain any four regenerative farming techniques. [5]

Comments of Examiners	Suggestions for Teachers
<p>(a) Majority of the candidates related the question with Geography and answered it correctly. Some candidates made mistake in writing the definition of agroforestry. They did not mention <i>agriculture or crop, animal husbandry with forestry</i>. A few candidates misinterpreted <i>objectives</i> of agroforestry as <i>advantages</i> and hence, wrote incorrect explanations.</p> <p>(b) Many candidates were confused between <i>sustainable development</i> and <i>sustainable agriculture</i>. They wrote the definition of sustainable development. In the definition of sustainable agriculture, many did not write points like, <i>eco-friendly</i> or <i>profitable</i>. In the second part of this question, some candidates wrote about different soil erosion controlling techniques instead of regenerative farming techniques.</p>	<ul style="list-style-type: none"> ▪ Advise students to comprehend the definitions / technical terms first and then learn. ▪ Discuss the important definitions and terms like Agroforestry / sustainable agriculture thoroughly. ▪ Give a clear understanding of the objectives of Agroforestry and regenerative farming practices.

MARKING SCHEME

Question 9

(a)	<p>Agroforestry is a farming system that integrates cropland or livestock with trees and shrubs.</p> <p>Objectives:</p> <ul style="list-style-type: none"> – To reduce pressure on natural forests for obtaining timber as well as non-timber produce. – To check soil erosion and to maintain the natural fertility of the soil. – To maintain ecological balance along with proper utilization of farm resources. – To make best use of all the available resources like land, manpower, livestock, ecological factors, etc. to obtain a variety of forest products such as food, fuel, fodder, livestock, recreation, etc.
(b)	<p>Sustainable agriculture can be defined in many ways as a farming practice and method that is profitable, environmentally friendly, and good for the community. It harnesses new technology and renews the best practices of the past.</p>

The four regenerative farming techniques are:

- Inter cropping in which two or more crops are grown together, each must have adequate space to maximise cooperation and minimise competition.
- Crop rotation is the practice of growing a series of dissimilar crops in the same area in sequential seasons.
- Agroforestry is planting trees along agricultural fields to increase tree cover.
- Polyculture is the practice of growing multiple crops on one piece of land.

Question 10

- (a) Define Trickle Drip Irrigation. State any two merits and two demerits of it. [5]
- (b) What are the conservation strategies for wildlife at national and international levels? Explain any one in detail. [5]

Comments of Examiners

- (a) Majority of the candidates attempted this question well. However, merits and demerits were not written correctly by some candidates.
- (b) Many candidates listed a few strategies correctly. A number of candidates did not give the strategies at the national and international levels as was asked in the question. Some could not classify the conservation strategies for wildlife at national and international levels and wrote the answer in an essay form. A few candidates wrote about the *ex situ* and *in situ* methods, which included the development of biospheres, national parks, etc. Several candidates were unable to explain any one strategy in detail.

Suggestions for Teachers

- Teach, 'trickle drip irrigation', with special emphasis on its importance, operation, and disadvantages.
- Create visualization and understanding in students' minds through illustrations and practical applications.
- Arrange a visit to clarify the concept of trickle drip irrigation and its merits and demerits.
- Show a video to explain the trickle drip irrigation.
- Clarify wildlife conservation strategies at national and international levels.
- Revise various concepts like types of conservation, strategies for conservation, related Laws and Acts frequently.

MARKING SCHEME

Question 10

- (a) Trickle drip irrigation is a process of supplying adequate amount of water to the plants slowly and directly to the soil.

Merits of trickle drip irrigation are:

- Suitable for all row crops
- 50% to 70% of water can be saved
- Crop yield is more
- Used in areas where well irrigation is common

Demerits of trickle irrigation are:

- Installations and maintenance are costly
- Not practical for most farming techniques
- The pipes get blocked and damaged easily
- Farm does not get irrigated uniformly

- (b) **The conserving strategies at national and international levels are:**

- Wildlife Protection Act, 1972
- Project Tiger
- IUCN
- Ramsar Convention
- CITES
- Convention on Biodiversity

(Any one of the above to be explained in detail.)

GENERAL COMMENTS

**Topics
found
difficult/
confusing by
candidates**

- LPG in rural and urban areas
- Disadvantages of Organic Fertilizers
- Role of Biotechnology in Agriculture
- Child education and girl child education
- Women centred development for controlling population growth
- Remote sensing satellite
- Reforestation
- Bio pesticide and bio fertilizer
- Biosphere reserves, core, and buffer zone
- Incineration

- International trade
- Trickle drip irrigation.
- Impact of Waste on Environment and Impact of increasing Population on land
- Sustainable agriculture and sustainable development
- Soil conservation methods and regenerative farming techniques
- Conservation Strategies for wildlife at national and international levels



Suggestions for Students

- Study the entire syllabus, avoid selective study.
- Read the scope of the syllabus prescribed for ICSE Environmental Science. Study every topic with sub-headings, to achieve clarity.
- Be attentive in the classroom when explanations and discussions are in progress.
- Try to comprehend the topic instead of just learning it.
- Master the technique of taking note of key words.
- Do ample written practice of questions, keeping in mind the format of the question paper.
- Prepare a list of abbreviations and revise repeatedly.
- Learn definitions containing all key words.
- Relate the topics with different examples taken from different sources.
- Understand the concepts first and then learn the definitions.
- Study each phenomenon / process keeping its advantages and disadvantages in mind.
- Use the 15 minutes reading time judiciously to make a proper choice of questions by reading the requirements of the questions carefully. Choose the questions in which you are sure of answering all the parts.
- Read the instructions given on the question paper attentively.
- Do not answer extra questions unnecessarily. Concentrate on the questions you need to attempt.
- Answer the questions in points.
- Be brief and to the point.
- Present answers neatly in legible handwriting.
- Read through the paper on completion to avoid mistakes.
- Give importance to the facts of the answer, rather than on its length.
- Read books, newspapers, and periodicals regularly.
- Solve past years' ICSE question papers.