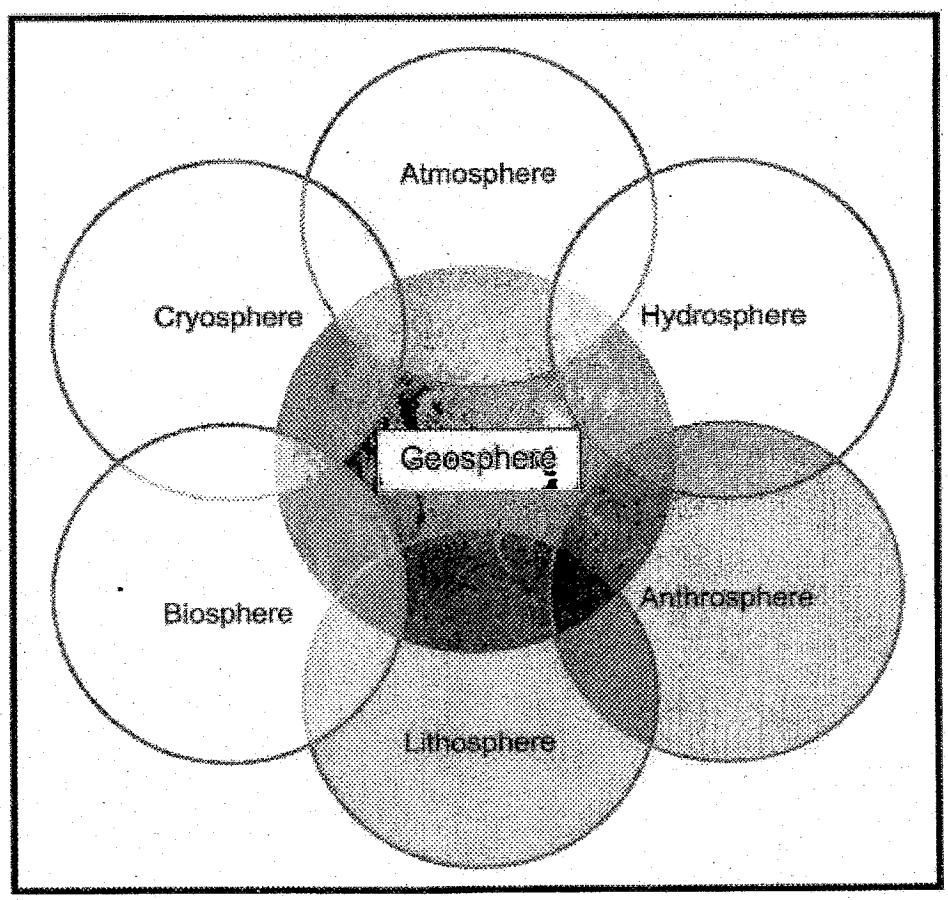
Confidential

Department of Examinations - Sri Lanka

G.C.E. (A/L) Examination - 2024

22 - Geography

Marking Scheme



This has been prepared for the use of marking examiners. Changes would be made according to the views presented at the Chief/Assistant Examiners' meeting.

Amendments to be included.

G.C.E. (A/L) Examination – 2024

22 - Geography

Marking Scheme:

Paper I

Part I	**(1- 40)**	**=**	**40 marks**
Part II		**=**	**30 marks**
Part III		**=**	**30 marks**
Total		**=**	**100 marks**

Paper II = **100 marks**

Paper I + Paper II = $\frac{100 + 100}{2}$

Final Total = **100 marks**

Common Techniques of Marking Answer Scripts.

It is compulsory to adhere to the following standard method in marking answer scripts and entering marks into the mark sheets.

1. Use a red color ballpoint pen for marking. (Only the Chief/Additional Chief Examiner may use a mauve color pen.)
2. Note down the Examiner's Code Number and initials on the front page of each answer script.
3. Write off any numerals written wrong with a clear single line and authenticate the alterations with the Examiner's initials.
4. Write down the marks of each subsection in a △ and write the final marks of each question as a rational number in a □ with the question number. Use the column assigned for Examiners to write down marks.

Example: **Question No. 03**

(i) ..... √ $\frac{4}{5}$

(ii) ..... √ $\frac{3}{5}$

(iii) ..... √ $\frac{3}{5}$

03 **1.** $\frac{4}{5}$ + (ii) $\frac{3}{5}$ + (iii) $\frac{3}{5}$ = $\frac{10}{15}$

MCQ answer scripts: (Template)

1. Marking templates for G.C.E.(A/L) and GIT examination will be provided by the Department of Examinations itself. Marking examiners bear the responsibility of using correctly prepared and certified templates.
2. Then, check the answer scripts carefully. If there are more than one or no answers Marked to a certain question write off the options with a line. Sometimes candidates may have erased an option marked previously and selected another option. In such occasions, if the erasure is not clear write off those options too.
3. Place the template on the answer script correctly. Mark the right answers with a 'V' and the wrong answers with a '0' against the options column. Write down the number of correct answers inside the cage given under each column. Then, add those numbers and write the number of correct answers in the relevant cage.

Structured essay-type and assay-type answer scripts:

1. Cross off any pages left blank by candidates. Underline wrong or unsuitable answers. Show areas where marks can be offered with check marks.

2. Use the right margin of the overland paper to write down the marks.

3. Write down the marks given for each question against the question number in the relevant cage on the front page in two digits. The selection of questions should be in accordance with the instructions given in the question paper. Mark all answers and transfer the marks to the front page, and write off answers with lower marks if extra questions have been answered against instructions.

4. Add the total carefully and write in the relevant cage on the front page. Turn pages of the answer script and add all the marks given for all answers again. Check whether that total tallies with the total marks written on the front page.

Preparation of Mark Sheets.

Except for the subjects with a single question paper, the final marks of two papers will not be calculated within the evaluation board this time. Therefore, add separate mark sheets for each question paper. Write paper 01 marks in the paper 01 columns of the mark sheet and write them in words too. Write paper II Marks in the paper II Column and wright the relevant details.

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General Certificate of Examination (Adv. Level)

Examination - 2024

Subject code 22 **Subject** Geography

Marking Scheme

Paper I

Part I

Question number	Answer number	Question number	Answer number	Question number	Answer number	Question number	Answer number
01.	3	11.	3	21.	2 & 4	31.	5
02.	2	12.	2	22.	2	32.	4
03.	3	13.	3	23.	5	33.	2
04.	4	14.	2	24.	1	34.	5
05.	5	15.	1	25.	4	35.	4
06.	1	16.	5	26.	1	36.	1
07.	2	17.	3	27.	4	37.	4
08.	5	18.	1	28.	2	38.	1
09.	1	19.	5	29.	4	39.	5
10.	4	20.	3	30.	2	40.	4

✪ **Special Instructions :**

01 mark per correct answer

Total Marks 01 × 40 = 40

General Certificate of Examination (Adv. Level)
Examination - 2024

22 - Geography

Paper I - Part II

Marking Scheme

Question 01

You are provided with a part of the 1:50000 topographic map of Matara, published by the Survey Department of Sri Lanka. The contours are shown at 100 feet interval. Answer the following questions based on the map.

(i) Name three coastal landforms marked by arrows A, B, and C of the map area. **(03 marks)**

A = Bay
B = Beach
C = Spit

(ii) Name the two administrative boundaries marked as D and E in the map area? **(02 marks)**

D = Grama Niladari Division Boundary
E = Divisional Secretariat Division Boundary

(iii) Name the feature that can be identified in pink color of the quadrilateral F, **(01 mark)**

F = Built-up Area

(iv) Calculate the area covered by quadrilateral G in square kilometers **(02 marks)**

G = 2 cm → 1 km
8 cm → 4 km
Hence, 4 x 4 = 16 km^2

$$Area = 8\ cm \times 8\ cm$$
$$= \left(\frac{1}{2} \times 8\ km\right) \times \left(\frac{1}{2} \times 8\ km\right)$$
$$= 4\ km \times 4\ km$$
$$= 16\ km^2$$

(v) Name the crop type shown in quadrilateral H **(01 mark)**

H = Other Crops

(vi) Name the physical feature shown in quadrilateral J **(01 mark)**

J = Gap

(vii) Describe in brief the distribution pattern of paddy and coconut cultivation in the map area.

(04 mark)

(02+02 = 04 marks)

Paddy cultivation

- The elevation of the map area, which is a coastal plain, is approximately 300 feet and the highlands are covered with forests and used for homestead cultivation. The lower plains are used for paddy cultivation, while the middle zone appears to be used for residential purposes and coconut cultivation.
- Paddy cultivation is scattered throughout the area and is more widespread in the north-western quarter of the map area. It can be identified that paddy is cultivated based on the natural streams in the north-western quarter.
- Paddy cultivation is spread in small narrow strips in the north-eastern quarter.
- Although paddy cultivation can be identified to a significant extent in the southern half of the map area, there is no connection with natural water resources. However, the distribution of paddy fields is a narrow streatch.
- In addition, a relationship between water supply and paddy cultivation can be seen because four tank-based paddy cultivation areas can be identified. Apart from that, it can be concluded that the other paddy cultivation areas may be rain-fed cultivation areas.
- Although paddy cultivation can be seen from about a kilometer inlandward from the coastal area, paddy cultivation can also be seen in two places near the coast.

Coconut cultivation

- There is no uniformity in the distribution of coconut cultivation, and it is scattered throughout the map area.
- It is a cultivation that does not show a strong relationship with altitude and can be seen more spread in the coastal area.
- The coconut cultivation also shows a certain relationship with the road system. It is clear from the distribution of the main road and the secondary road system spread in the map area.
- The central area of the map is used for coconut cultivation. Coconut cultivation is almost impossible to see in the north-western quarter.
- Also, there is a patch of coconut land spread from the coastal area to the center of the map area and to the northern border.
- In the southern area, coconut cultivation is spread over a relatively larger area.

(viii) Explain three geographical factors contributing to the settlement pattern in the map area.

(06 Marks)
(03x02 = 06 marks)

The settlement distribution in the map area is uneven and the settlements are spread in a relatively clustered manner. Both physical factors and human factors seem to have influenced such a distribution:

- Physical factors
  - ■ Being a relatively flat land
  - ■ Forests, scrub and reservoirs
- Human factors
  - ■ Road system
  - ■ Agriculture
  - ■ Impact of service center

■ Being a relatively flat land

The maximum elevation is about 300 feet and there is no severe slope there either. Therefore, all other areas in the area, except for the areas with an elevation above 200 feet and the forested areas, have been used for settlement.

■ Forests, scrub and reservoirs

The forest and Kekunadora reservoir in the center of the map, as well as the forest and scrub in the northeastern area, have affected the expansion of settlements.

■ Road system

The minor road network connected to the main road running parallel to the coast has been a major factor for the settlement distribution. The increase in elevation to the north of the map area and the less extensive road network are also the reasons for the decrease in settlement expansion in that stretch.

■ Agriculture

Coconut cultivation seems to be particularly important in the distribution of settlements. Most of the settlements in the southern half of the map are related to coconut cultivation. The northern half shows that the settlement has spread less, and the main reason for this is the widespread paddy cultivation and commercial coconut cultivation.

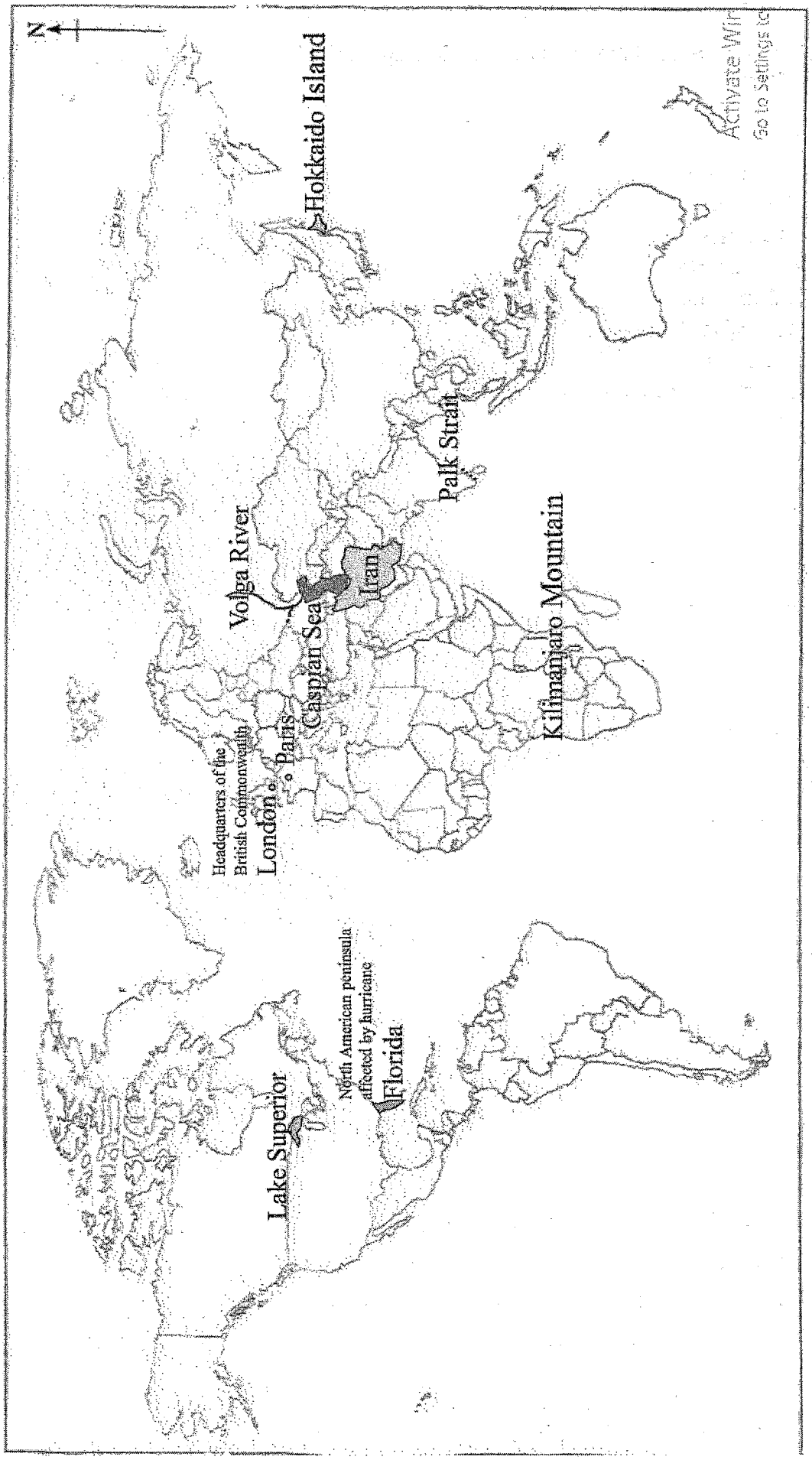
■ Impact of service center

There may also be a greater concentration of settlements in the surrounding area to obtain the services of the service center is visible in the map area.

Question 02

2. **Mark and name** the following in the world map provided using conventional symbols and colours.
   - Paris
   - Iran
   - Caspian Sea
   - Volga River
   - Palk Strait
   - Lake Superior
   - Hokkaido Island
   - Kilimanjaro Mountain
   - The city where the Headquarters of the British Commonwealth is located
   - The North American peninsula which was affected by the hurricane 'Milton' in 2024

(10 *marks*)



Part III

Question 03

(i) State what is meant by primary data and secondary data with examples **(02 marks)**

(01+01 = 02 marks)

- **Primary Data**
  Primary data refers to the data collected firsthand for a specific purpose directly from the source. This type of data is original and is gathered through methods such as surveys, observations, and measurements.
  Example: - Measuring the weight of students in a classroom.

- **Secondary Data**
  Secondary data is data that has already been collected by someone or some institutions for a different purpose and is reused for further analysis or study. Sources of secondary data include libraries, the internet, or the maps.
  Example: Published population data by the census for year 2012.

(ii) What is the difference between qualitative data and quantitative data? **(02 marks)**

(01+01 = 02 marks)

- **Quantitative Data**
  Quantitative data refers to information that can be identified, measured, or analyzed numerically using statistical methods. These types of data is often presented in tables, graphs, maps, or other visual formats to highlight trends and patterns.
- **Qualitative Data**
  Qualitative data focuses on the descriptive and non-numerical aspects of a subject. It emphasizes qualities such as color, smell, taste, appearance, beauty, or attractiveness, which cannot be measured numerically but can provide in-depth understanding and insights.

(iii) Briefly describe spatial data and temporal data with examples. **(05 marks)**

(Description = 2 + Example = ½ x 2 = 05)

- **Spatial Data**
  Spatial data refers to information that shows variations from place to place and is often tied to natural or administrative boundaries. Spatial data is essential for mapping and helps visualize patterns and relationships across locations, which can be easily understood when analyzing maps.
  For example, the distribution of population or population density across districts or divisional secretariats in Sri Lanka.

- **Temporal Data**
  Temporal data focuses on changes that occur over time. It highlights how specific variables or phenomena evolve over identifiable time periods. Such temporal variations can be effectively represented using various graphical methods, such as line graphs, bar charts, or time-series maps, to facilitate better understanding.
  For example, population data of Sri Lanka can be presented according to different census years.

(iv) Describe what is meant by ungrouped data and explain with two examples why ungrouped data are converted into grouped data **(06 marks)**

(Description 02 + Explain 04 = 06 marks)

- **Ungrouped data**

  The specialty of ungrouped data is that each person or event counted has a precise and specific value. A population census or a housing census can be cited as an example of this. The data collected in this way can also be known as ungrouped data or raw data. Therefore, ungrouprd data is data collected individually, and more meaning can be added to it by arranging this data in a certain order. The individual data collected in this way can be converted into grouped data by including it in a certain group.

- **Grouped data**

  When using grouped data, the data does not have an individual value. That is, ungrouped data is used for data representation after some grouping or division into classes.

  Example 1 - When presenting data according to the size of the lands cultivated with paddy in a country or a certain area, some kind of grouping is made and accordingly how many plots of land of each size exist It can be easily understood numerically.

  Example 2 - After a census, the data is displayed according to ethnicity, religion, age group, or certain administrative units.

  Although ungrouped data can be transformed into grouped data by being processed to make it easier to understand, it is also unique that grouped data cannot be transformed into ungrouped data.

Question 04

(i) Why the map is important in Geography? Give two reasons. **(02 marks)**

(01+01 = 02 marks)

- **Summarizing Detailed Information**

  Lengthy descriptions or information can be presented in a concise and simplified manner. This is particularly important for presenting comprehensive data clearly and efficiently.

- **Utilization to Represent Spatial and Temporal Patterns**

  Geographical information can be used to depict spatial and temporal patterns. This highlights changes or variations based on location and time.

- **Representation of the Real State of the Landscape**

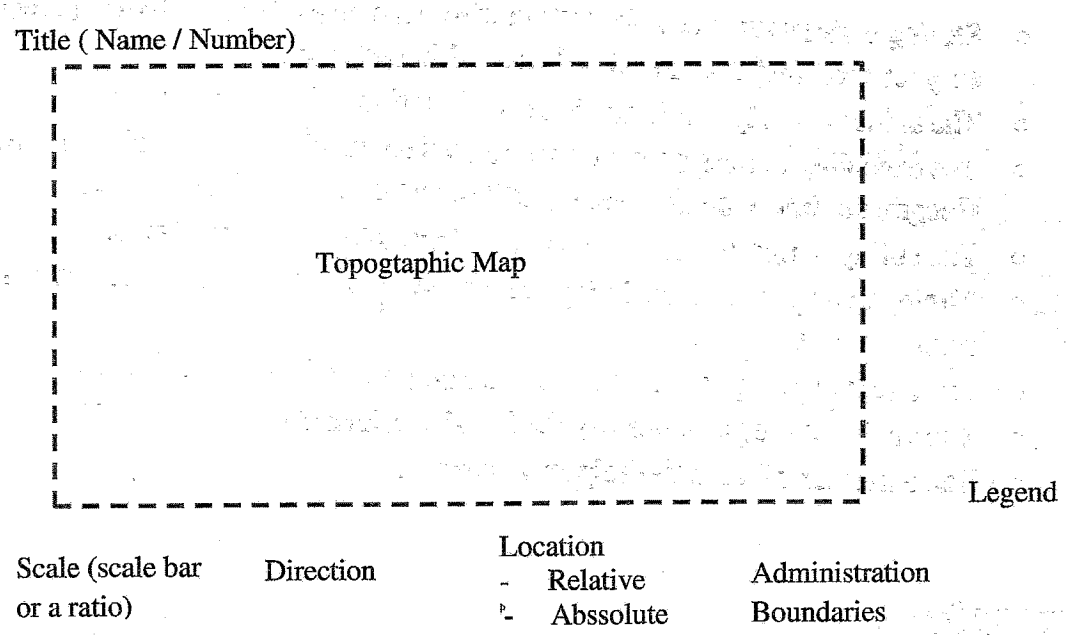
  A large volume of data and information related to the real state of the landscape can be presented using standardized symbols, colors, letters, and numbers.

- **Planning and decision-making purposes**

  Maps serve as a tool to visualise complex data, allowing planners to see patterns, relationships, and trends. By translating data into a spatial context, maps enable planners to make informed decisions.

(ii) Mark and name any three peripheral information that can be found on a topographic map with the help of a sketch. **(03 marks)**

(Marking ½ + Naming ½)



(iii) Discuss in brief any **two** modern cartographical technologies used in geography. **(04 marks)**

(2 x 02 = Marks)

Geographical Information System

The Geographical Information System (GIS) can be defined as a methodology used for inputting, storing, processing, and presenting spatial information using computer hardware and software. For this, the following five fundamental components of a GIS are essential:

1. Computer Hardware
2. Computer Software
3. Data
4. Users (People)
5. Methods

Global Positioning System

The Global Positioning System (GPS) is a system designed to accurately determine the location of any object or feature on Earth by using a constellation of satellites positioned above the Earth. It identifies the position of a specific point in coordinates with high precision. This system is also one of the data sources for Geographic Information Systems (GIS). The GPS system consists of three main components: space segment, control segment and user segment.

Remote Sensing

Remote sensing is the technology used to identify, study, interpret, and analyze objects or activities from a distance, without physically reaching them. In remote sensing processes, energy reflected or emitted from an object is captured and recorded, which is then processed and analyzed. Remote sensing helps in collecting data and information necessary for create a map,

(iv) Explain **three** practical advantages of modern cartographical methods. **(06 marks)**
(3x 02 = 06 marks)

- Storing various types of information within a map as thematic layers, allowing for easy retrieval and re-use of the data for different purposes.
- The ability to analyze information based on three-dimensional maps.
- The capability to analyze not only spatial data but also non-spatial data in a Geographic Information System (GIS) is considered a unique feature.
- The ability to update geographic data quickly in a short time frame.
- Minimizing human errors during the creation of thematic maps, resulting in more accurate maps.
- The ease of storing, manipulating, and transporting large map datasets.
- The ability to precisely identify the location relevant to a specific event.
- The existence of a multi-disciplinary approach.

Question 05

The marks scored by 30 students at a term test in Geography are given in Table 1. Using the data given in the table, answer the following questions.

Table 1 : Marks scored by 30 students at a term test in Geography

38	66	43	9	33	64	92	25	73	48
45	55	54	16	40	72	52	34	28	55
55	57	65	24	52	80	65	42	37	68

(i) Copy the Table 2 given above into your answer script and complete it with the calculated values of frequency (f), mid-point (x) and fx. **(06 marks)**

Class Interval	Frequency (*f*)	Mid-point (*x*)	*fx*
0 - 9	1	4.5	4.5
10 - 19	1	14.5	14.5
20 - 29	3	24.5	73.5
30 - 39	4	34.5	138
40 - 49	5	44.5	222.5
50 - 59	7	54.5	381.5
60 - 69	5	64.5	322.5
70 - 79	2	74.5	149
80 - 89	1	84.5	84.5
90 - 99	1	94.5	94.5
	30		1485

(i) Marks for completing the table

	Marks
Frequency (f)	02
Mid-point (*x*)	02
fx	02
Total marks	**06**

(ii) Using the data in Table 2 which you have completed, calculate the mean of the marks obtained by students. **(03 marks)**

$\sum f = 30$

$\sum fx = 1485$

$\bar{x} = \frac{\sum fx}{n}$

$\bar{x} = \frac{1485}{30} = 49.5$

(ii) Marks for $\bar{x}$:
Calculation of Mean

	Marks
Formula	01
Values of the formula	01
$\bar{x}$ (Mean)	01
Total marks	**03**

(iii) Briefly describe **three** salient features in the performance of the students in relation to the calculated mean. **(06 marks)**

(3x02 = 06 marks)

- **Majority of the students fall near the Mean**: The majority of students fall within the class intervals 40-49 and 50-59, with frequencies of 5 and 7 respectively. These intervals surround the calculated mean (49.5), indicating that most students scored around the average.
- **High performance (Above the Mean)**: 16 students have scored more than the mean of scores (49.5). It indicates more than 50% of the students are above the mean.
- **Low performance (Below the Mean)**: A small number of students (9) scored in the lower class interval between (0–39), indicating that only a few performed significantly below the average.
- **Overall performance**: This suggests that, overall, the students have achieved positive results in Geography.

Question 06

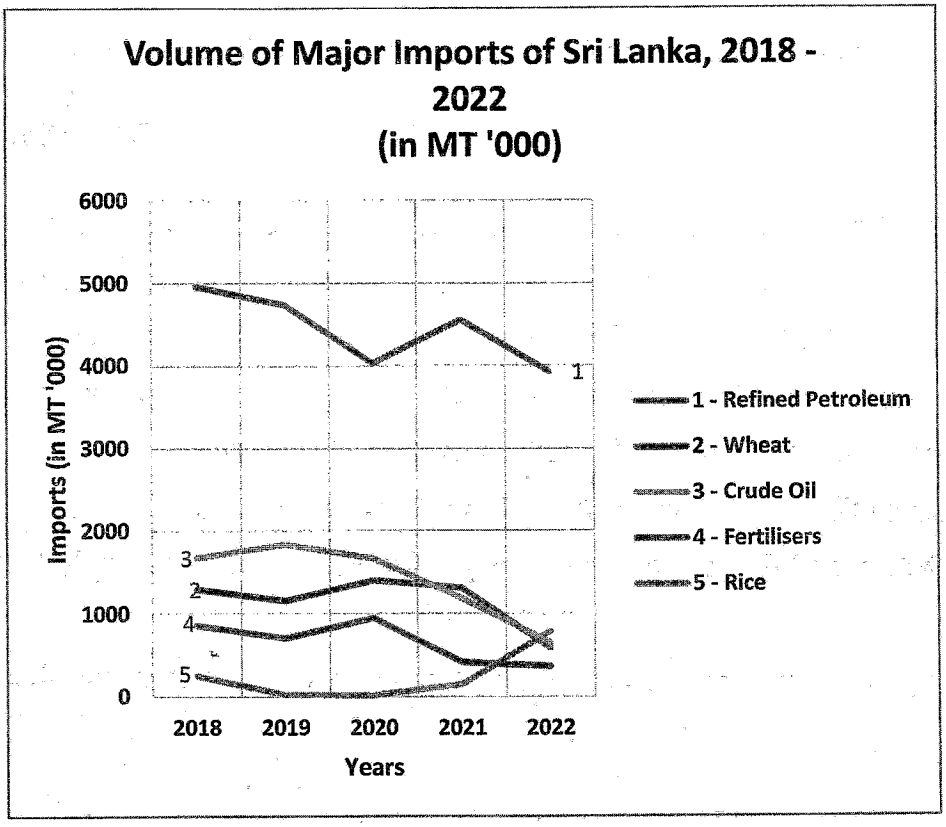
The volume of major Imports of Sri Lanka during the period 2018 – 2022 is shown below in Table 3.

Table 3: The Volume of Major Imports of Sri Lanka (in thousand metric tonnes)

Item	2018	2019	2020	2021	2022
Refined Petroleum	4959	4740	4028	4553	3927
Wheat	1297	1159	1404	1307	583
Crude Oil	1674	1842	1667	1182	649
Fertilisers	861	707	952	412	363
Rice	249	24	16	147	783

Source: Central Bank of Sri Lanka, Annual Report, 2023.

(i) Draw a Multiple Line Graph to represent the volume of major imports of Sri Lanka from 2018 to 2022 (Use a graph paper for this drawing). **(08 Marks)**



Marks allocation	
Title	½
Source	½
Vertical axis	½
Horizontal axis	½
Legend	1
Correct lines	5
Total	**8**

Source: Central Bank of Sri Lanka, Annual Report, 2023.

(ii) Based on the graph you have drawn, describe **four** salient features of the volume of major imports of Sri Lanka. **(4x01= 04 marks)**

- Rice imports increased from 16 mt in 2020 to 783 mt in 2022. Because domestic production was hampered by fertiliser shortages.
- Volume of fertilizer imports declined from 952 mt in 2020 to 363 mt in 2022 and indicated very low volume of import in 2022.

- Imports crude oil declined from 1842 mt in 2019 to 649 mt in 2022 due to the increase in average price of crude oil in 2021.
- Refined petroleum imports also indicated decrease in volume of 3927 mt in 2022 from 4553 mt in 2021.
- Wheat imports increased in 2020 (1404 mt) and decreased to 583 mt in 2022.
- The overall pattern of major imports of Sri Lanka except rice indicated declining trend after 2021 due to the impact of country's economic crisis.

(iii) Name another graphical method that can be used to present the data given in Table 3 and explain its suitability giving **two** reasons.

(Naming = 1 mark + Reasons 2 marks = 03 Marks)

Multiple Bar Graph,

Composite bar graph

Pie chart

- The differences between selected variables as well as their changes over time could be presented by this method.
- The ability to present the temporal changes of a number of variables in one graph is an advantage.
- If the data are related to spatial units, this graph could be used to present spatial changes of a particular variable over time.
- It is easy to identify the volume of distribution pattern of imports.
- Annual distribution pattern can be depicted.
- Easy to compare the variables.

22 – Geography
Paper II

Part I – Physical Geography

Question 01

1. (i) Name four major plates in the Lithosphere. **(02 marks)**
(4x0.5 = 02 marks)

- Pacific Plate
- Indo-Australian Plate
- Eurasian Plate
- African Plate
- North American Plate
- South American Plate
- Antarctic Plate

(ii) Describe in brief the **three** types of movements associated with plate tectonics. **(06 marks)**
(3x02= 06 marks)

As a result of the recurrent movement of thermal convectional currents the plates of the lithosphere begin to move. Movements of plates take place in three ways:
(i) Divergent movements, (ii) Convergent movements, and (iii) Transform movements.

Divergent movements:

When two plates move away from each other the process is called a divergent movement. In the process, magma comes to the surfae from the upper region of the mantle thereby paving way to create a new ocean floor. E,g. mid oceanic ridges. A divergent boundary is a fault where the two plates are moving away from each other. Volcanic activity is common in these areas.

Convergent movements:

A convergent movement is a boundary where two separate plates are pushing into each other, where two plates collide the weaker plate is destroyed and the land between the two plate undergo numerous changes. As such, convergent plate boundaries are destructive.
In the collision, one plate submerges under the other and the pressure generated in the process results in fold mountains. e.g. the Himalayas. When an oceanic plate submerges under a continental plate deeps/ trenches are created. E.g. Mariana Trench. When an oceanic

plate is pushed up to the mantle the rocks will be melted and volcanic island arcs will be formed. E.g. Havaii Islands.

Transform movements:

Transform movements are formed where two tectonic plates slide past each other horizontally and cause the rock to fracture. When two plates move parallel to each other, faults occur at plate boundaries. One of the most well-known transform boundaries is the San Andreas fault in California.

(iii) Discuss in brief, **two** types of folds associated with compressional movements in the lithosphere with suitable diagrams. **(06 marks)**

(Discussion 2 + Diagram 1 = 03 x 2 = 06 marks)

Compressional movements is when rocks push into each other, causing them to fold or fracture. Compression is a common type of stress at convergent plate boundaries. Different types of folds are associated with compressional movements. They are:

Symmetrical folds:

A fold in which the two limbs are essentially mirror images of each other. In a symmetrical fold, the limbs slope at approximately the same angle on either side of the axial surface. Symmetrical folds are typically formed under compressional forces and indicate a balanced distribution of stress during their formation. They are often seen in mountainous regions undergoing tectonic activity.

Asymmetrical folds:

A fold in which one limb dips more steeply than the other. Folds with different angles where the limbs slope at different angles on either side of the axial surface. The angle of the fold's centre axis determines if it is symmetrical or asymmetrical. In an asymmetrical fold, the limbs of the fold are roughly unequal in length.

Monoclinal folds:

Most monoclines are classified as drape folds, because the sedimentary rocks are draped as a result of movement along the underlying faults. Monoclines are often caused by localized deformation in horizontal rock layers. Monoclines are step-like folds in rock layers. They typically have a zone with more steeply dipping rocks, gently-dipping, or even horizontal rock layers. Example for monoclinal folds: Colorado Plateau of the southwestern United States.

Isoclinal folds:

An Isoclinal fold is a tight fold in geology where the limbs are nearly parallel to each other. Fold can be any size, from very small to tens of kilometers in wavelength. Isoclinal folds can develop in shear zones. Isoclinal folds are similar to symmetrical folds, these folds both have the same angle and are parallel to each other.

Recumbent folds:

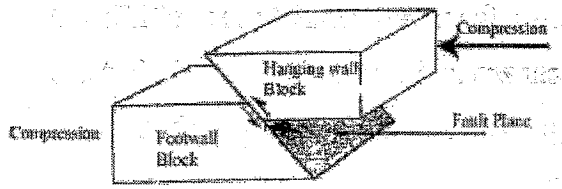
Recumbent folds are geological structures that are partially overturned and have a nearly horizontal axial plane. Recumbent folds are usually asymmetrical and can occur in a variety of geological settings including orogenic belts. They can also develop in areas with local extensional deformation.

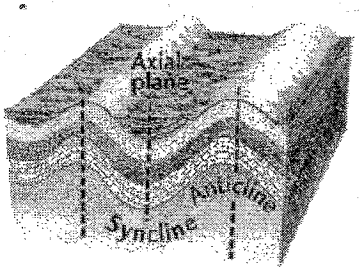
Overturned folds:

A type of fold in rock, which is created where compressional forces are asymmetrical, so that one limb of the fold is pushed over the other limb and overrides it.

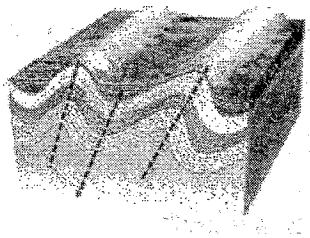
Anticlinorium and Synclinorium:

A fold with an arch-like shape in which the limbs dip away from the axis. After erosion, the oldest rocks are exposed in the central core of the fold. In a trough-shaped syncline fold the limbs dip toward the axis. After erosion, the youngest beds are exposed in the central core of the fold.

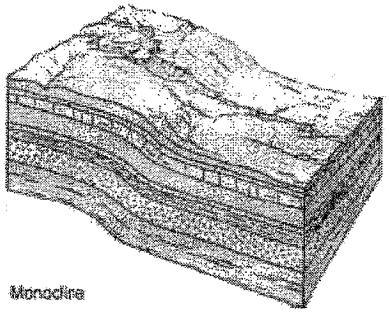




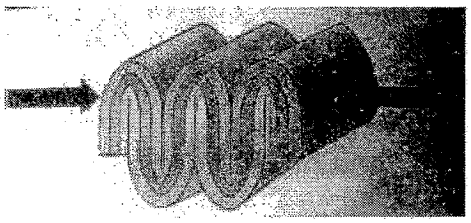
Symmetrical Folds



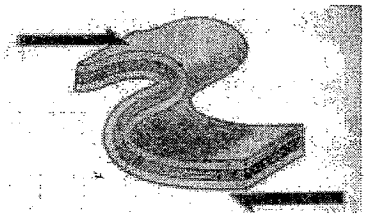
Asymmetrical Folds



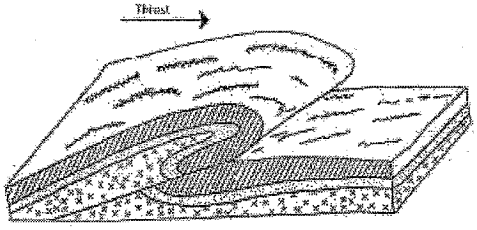
Monocline Folds



Isoclinal Folds



Recumbant Folds



Thrust Fold

(iv) Discuss in brief **two** types of faults created by tensional movements in the lithosphere with suitable diagrams. **(06 marks)**

(Discussion 2 + Diagram 1 = 03 x 2 = 06 marks)

A fault is a fracture or discontinuity in rock that occurs when rock masses move, causing significant displacement. Faults can range in length from millimeters to thousands of kilometers and can be found all over the world. The following landforms are associated with tensional movements. They are:

Normal fault: Normal faults are also known as dip-slip faults, tensional faults, or gravity faults. They are most common type of fault and are caused by tensional forces. Normal faults are often found along divergent plate boundaries. The San Andreas fault in California is an example of normal faults.

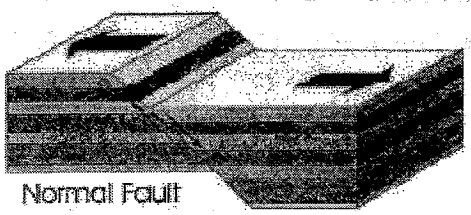
Step fault: The term step fault is applied to that parallel fault where downthrown of all is in the same direction and it gives a step-like arrangement.

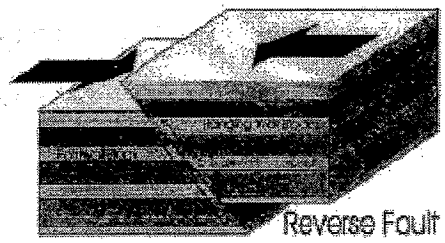
Horst: A horst is a block of the Earth's crust that has been raised relative to the land on either side, usually by two steep-angled faults. Horsts are typically long compared to their width, and are characterized by a linear up-land bounded by faults. A horst is a heap of land that rises above its surroundings. Horsts are often together with grabens which are down-dropped blocks of the Earth's crust that result from the pulling apart of the crust. The French Vosges Mountains and the black forest in Germany are examples of large horsts.

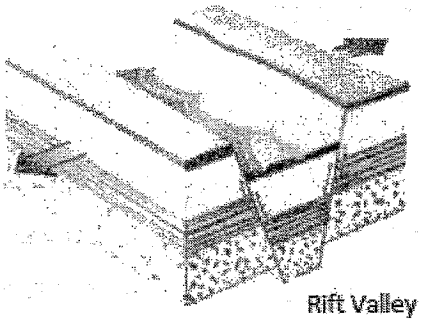
Block fault: A type of normal faulting in which segments of the crust are broken and displaced to different elevations and orientations. Tectonic and localized stresses in the Earth's crust break up large areas of bedrock into blocks.

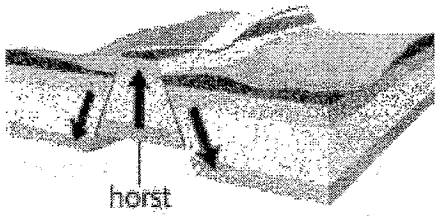
Thrust fault: Thrust faults are characterized by horizontal compression rather than by vertical displacement. In geography a thrust fault is a type of reverse fault that occurs when one section of land slips over another at a low angle, usually less than 45 degrees. Thrust faults are a result of compressed land, and they typically don't show on the surface of the earth.

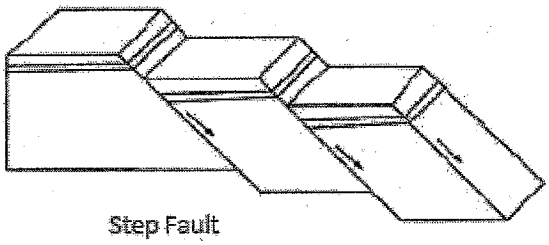
Rift valley: A valley is formed by block faulting in which tensional stresses tend to pull the crust apart. Synonymous with graben. The process that creates a rift valley is called extensional tectonics.

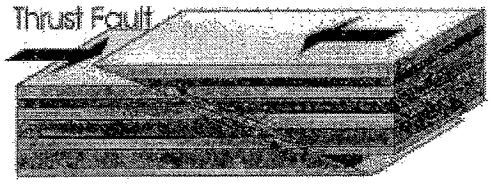

Normal Fault


Reverse Fault


Rift Valley


horst


Step Fault


Thrust Fault

Question 02

(i) Name **four** districts in Sri Lanka where landslides occur frequently. **(02 marks)**
(4 x 0.5 = 02 marks)

- Nuwara Eliya
- Badulla
- Kandy
- Kegalle
- Ratnapura
- Galle
- Kalutara
- Matara

(ii) Describe **two** types of landslides that are identified in Sri Lanka with suitable diagrams **(06 marks)**
(Description 2 + Diagram 1 = 3 x 2 = 06 marks)

Landslides occur when the force of gravity acting down a slope is greater than the strength of the slope's materials. Sri Lanka is prone to landslides, especially in the central highlands and southern hills. There are five types of landslides can be identified in Sri Lanka. They are:

Creep:

The slowest and least perceptible form of mass wasting, which consists of a very gradual downhill movement of soil and regolith.

Debris Fall:

A fall is the rapid downslope movement of dislodged rocks by falling, rolling, bouncing, or sliding.The main difference between a debris flow and a fall is the composition of the material and the type of movement.

Slumb:

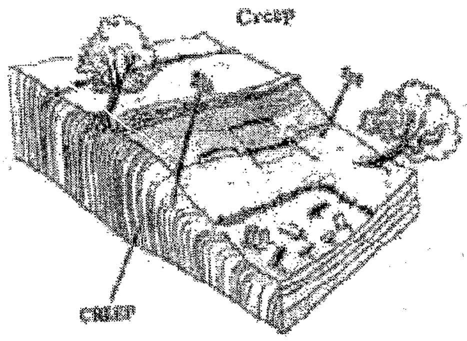
An extremely common form of mass wasting is a slump which is considered to be in the slide category. Slumping involves slope collapse with a backward rotation.

Rock slide:

A rock slide is a type of mass wasting that occurs when a mass of rock moves quickly down a slope. Rock slides can occur in mountainous regions, coastal cliffs or under water. They can also happen in areas where artificial excavation takes place, such as mines and quarries. During a rock slide, the rocks tumble downhill, loosening other rocks and smashing everything in their path.

Debris flow:

Stream like flow of muddy water heavily laden with sediments of various sizes. It is a fast-moving, destructive landslide that's a combination of mud, water, soil, rocks, boulders, and sometimes trees, homes or vehicles. Debris flows are also known as mudflows. Debris flows can be triggered by high volume, high intensity rainfall.



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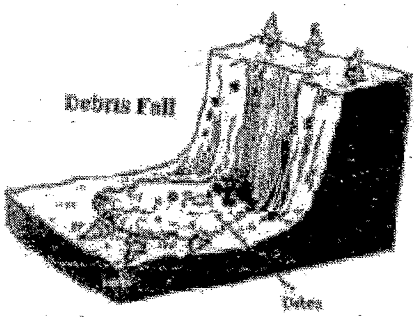

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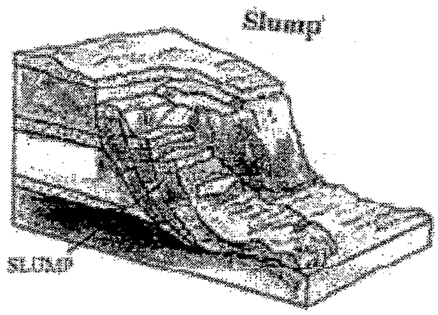

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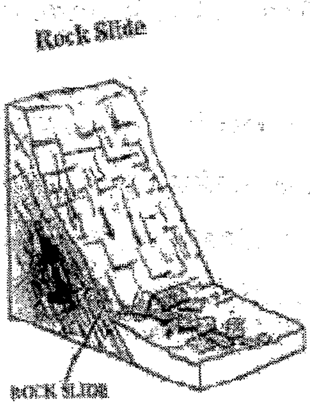

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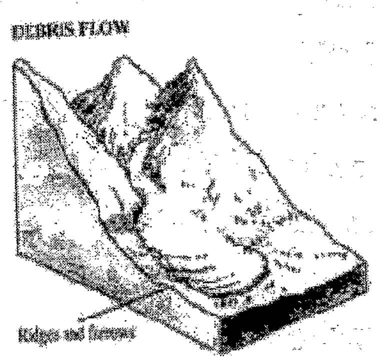

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(iii) Explain **two** major physical factors that caused landslides in different areas of Sri Lanka with examples. **(2 x 3 = 06 marks)**

(Explain 2 + Example 1 = 3 x 2 = 06 marks)

Intensity of rainfall: Heavy rainfall can saturate the soil and cause it to become unstable, leading to landslides. This is particularly common in areas with poor drainage systems.

Nature of slope: Nature of a slope can contribute to Landslides in several ways including steepness, type of material, water infiltration and unstable ground.

Geological structure: Geological factors such as steep slopes, unstable rock formations, and weak soil sructures can also contribute to landslides.

Rock weathering: Weathering is an important factor in landslides. Heavily weathered landscapes are much more likely to be eroded. Heat, cold, water and oxygen are all common forces of weathering.

Ground water: Several factors can increase a slope's susceptability to a landslide event. Adding water to the material on a slope makes a landslide more likely to happen. This is because wateradds weight, lowers the stregth of the material and reduces friction, making it easier for material to move down slope.

(iv) Discuss **three** measures that could be adopted to minimize the occurrence of landslides in Sri Lanka. **(06 marks)**

(3 x 02 = 06 marks)

- Reforestation – Replanting with trees in the slope areas.
- Construction of roads, houses and dams in vulnerable areas should be avoided.
- Implementing community-based awareness programs.
- Introducing appropriate land use practices.
- Installing slope movement monitoring instruments in hilly areas.
- Implementing a non-structural mitigation measures to reduce the landslide risk by introducing appropriate land use practices.
- Apply structural methods such as construction of retaining structures, construction of surface drainage etc.
- Monitoring of the site should be carried out continuously for any possible slope movements.

- Mapping vulnerable landslide areas. (NBRO)
- Management practices need to be followed to prevent water infiltration in to the soil layers.
- Implement laws very strictly to control intensive agriculture in hilly areas.
- To reduce landslids in hilly areas using Sloping Agricultural Land Technology (SALT) method.

Question 03

(i) Name **four** (04) major areas of the World where the Grasslands and Savanna are found. **(02 marks)**

(4 x 0.5 = 02 marks)

Temperate Zone Grasslands:

- Steppes in Russia,
- Prairies in North America,
- Pampas in Argentina,
- Downs in Australia,
- Velde in South Africa.

Tropical Grasslands:

- Savanna in Africa,
- Campos in Brazil,
- Lanos in Colombia and Venezuela.

(ii) Describe in brief **three** (03) salient features of Grasslands and Savanna. **(06 marks)**

(3 x 2 = 06 marks)

Climate

- In temperate zone grasslands a long dry season and a short rainy season could be seen.
- Annual rainfall which is between 250-750mm, is not sufficient for growth of a forest.
- Humidity is low.
- The highest temperature in the coldest month is about 180C – 200C.
- Annual rainfall in tropical grassland regions is about 1016 – 1500mm.
- Strong dry winds.

Vegetation

- Tall trees and scrubs could be seen.
- Grass varieties could also be found in abundance.

Plant species

- In temperate zone grasslands, various grass varieties and trees like Oak and Willow are found.
- In tropical savanna regions tall trees like Acacia and Biobab and scrubs are widely distributed.

Animal varieties

- In temperate zone grasslands animals like birds, Brown bear, Elk, and fox are found.
- In tropical grassland regions, animals such as lions, Zebras, Elephants, Giraffes, Bysons, and Ostriches could be seen.

(iii) Discuss in brief **three** major problems faced by Grasslands and Savanna lands of the World at present? **(06 marks)**

(3 x 2 = 06 marks)

The Problems faced by Grasslands and Savanna at Present are twofold:

- Problems due to human activities
- Problems caused by natural disasters

Human activities

Overgrazing:

Animal husbandry and unsustainable agricultural practices, and deforestation contribute significantly to soil degradation and desertification in grasslands and savannas. This leads to a loss of vegetation, reduced soil fertility, and increased vulnerability to erosion, which disrupts ecosystems and reduces agricultural productivity.

Desertification:

In some areas desertification has occurred due to the expansion in cultivated area. This occurs in grassland areas. e.g. Regions South of Sahara desert in Africa.

Loss of biodiversity:

Due to overgrazing, unsustainable agricultural practices and Deforestation.

Habitat Loss and Fragmentation:

Expanding agriculture, urbanization, and infrastructure development fragment grassland and savanna habitats, isolating plant and animal populations. This fragmentation affects biodiversity, disrupts wildlife migration patterns, and limits the natural regeneration of ecosystems, further threatening species that rely on these unique habitats.

Natural Disasters

Climate Change:

Rising temperatures, altered rainfall patterns, and increased frequency of droughts impact these ecosystems, altering vegetation patterns, biodiversity, and water availability. Climate change intensifies the risk of wildfires and can shift savanna and grassland ecosystems into shrublands or even deserts, threatening the native flora and fauna.

Climate Change-Driven Natural Disasters:

The increasing intensity and frequency of natural disasters, such as hurricanes, wildfires, and droughts, are intensified by climate change. These events disrupt ecosystems, devastate human communities, and threaten biodiversity. Rising temperatures and unpredictable weather patterns intensify these disasters.

(iv) Examine **three** major threats faced by the Pathana grasslands in Sri Lanka. **(06 marks)**

(3 x 2 = 06 marks)

On the basis of relief and climate, four major grassland systems could be seen.

Wet Patana Grasslands:

Horton Plains, Seetha Eliya, Sandatenna, Agarapatana, Ambewela, and Kandapola

Dry Patana Grasslands:

Rakwana area close to Sinharaja, Bandarawela and Welimada mountain.

Damana Grasslands (talawa):

Distributes in lowland dry zone areas such as Gal oya, Polonnaruwa, Maduru Oya etc. Mana (tall-grass) and Iluk are dominant grass varieties.

Villu:

Could be seen in water-logged lowland areas during the rainy season. Distributed in in areas such as Somawathi, Manampitiya, Wilpattu National Park etc.

Problems faced by Pathana grasslands of Sri Lanka

Deforestation:

In the year 1900 the Sri Lanka's forest cover was 70%. By 1920 it declined to 49% and in 2005 it was as low as 20%.

Human activities:

(Agricultural Expansion and Land Conversion) Conversion of Pathana grasslands into agricultural lands, especially for tea and vegetable cultivation, has significantly reduced grassland areas.

Land Encroachment:

Landlessness and fragmentation of land contribute to land encroachment, which can lead to the destruction of grasslands.

Invasive Species:

The spread of invasive plant species, such as Lantana camara and Clidemia hirta, has disrupted the native biodiversity in Pathana grasslands. These invasive species outcompete native grasses and shrubs, altering soil composition, depleting resources essential for indigenous flora and fauna, and reducing the grasslands' overall resilience.

Village expansion:

The expansion of villages and towns has taken place.

Illicit logging:

Land has been severely eroded.

Establishment of new settlements.

Climate Change and Altered Rainfall Patterns:

Changing climate patterns and erratic rainfall have impacted the hydrology of Pathana grasslands, leading to prolonged dry periods and increased risk of wildfires. These conditions alter the natural vegetation cycle, stress native plant species, and reduce the grasslands' capacity to support grazing wildlife, affecting the ecological balance and sustainability of these habitats.

Question 04

(i) Name any **two** main methods by which Sri Lanka receives rainfall? **(02 marks)**

(01+01 = 02 marks)

Main rainfall receiving methods

1. Monsoons (Southwest and Northeast)
2. Convection (Inter-monsoon)
3. Cyclones (Inter-monsoon)

(ii) Selecting one of the methods you have mentioned in above (i), describe in brief **three** salient features of it. **(06 marks)**

(3 x 2 = 06 marks)

Monsoon rains

Sri Lanka receives rainfall from two monsoons. They are named according to the direction from which they blow.

I Southwest Monsoon winds

II Northeast Monsoon winds

I Southwest Monsoon winds

- From May to September
- Due to the oscillation of ITCZ to the north of Sri Lanka winds blow from the southwest.
- Winds blowing over the Indian Ocean carry a large amount of water vapor.
- Owing to the relief features western slopes of the central highlands receive a large amount of rainfall. Eastern side of the mountains gets less rainfall.
- Floods and landslides are frequent.

II Northeast Monsoon winds

- From December to February
- Due to the oscillation of ITCZ to the south of Sri Lanka between south latitudes 50 – 100 winds blow from the north east.
- Winds blowing over a huge land mass carry a less amount of water vapor.
- Low rainfall.
- Northern and Eastern parts of the island receive rainfall; northeastern regions of the mountains receive high rainfall (e.g. Knuckles region).

Convectional rains

- A large amount of water vapor owing to its location in proximity to the equator and to a huge ocean surface brings year round convectional rains to Sri Lanka.
- The effects of convectional rains are submerged during the monsoons and cyclones, but in the months of March and April the effects are clearly seen.
- Clear skies in the mornings, cloudy afternoons and storms and lightning in the evenings are main characteristics.
- At night sky is clear
- Mountain slopes receive high rainfall; coastal areas receive less rainfall.

Cyclone rains

- Effects of cyclones is much higher in the months of November and December.
- Low depressions can develop into cyclones.
- Low depressions originate in the Bay of Bengal blow across the island in the Northwest direction.
- North and Eastern regions of the island are mostly affected.
- Rains could be disastrous as cyclone gets stronger. Disasters like floods, Landslides, damages to properties could occur.

(iii). "Based on the distribution of rainfall and temperature, Sri Lanka is divided into five climatic zones". Select one of the climatic zones and describe **three** major characteristics of that zone.

(06 marks)

(3 x 2 = 06 marks)

Sri Lanka could be divided into five climatic zones based on temperature and rainfall.

1. Lowland Wet Zone
2. Lowland Dry Zone
3. Highland Wet Zone
4. Highland Dry Zone
5. Semi-Arid Zone

Lowland Wet Zone

- Average annual temperature is around 270 C
- Year-round bright sun shine
- Average annual rainfall is over 2000 mm
- Heavy rainfalls during the Southwest Monsoon
- Availability of a rainfall surplus
- Rainfall is spread year round
- Favorable climatic conditions for plant growth

Lowland Dry Zone

- Average annual temperature is around 300 C. However, North and Eastern regions experience higher temperatures.
- Bright sun shine
- Average annual rainfall is between 125- - 2000 mm.
- Northeast Monsoon and cyclones bring rains
- May to September is a dry season

- Trees able to resist dry season
- From the earliest times large reservoirs have been built to store water

Highland Wet Zone

- Low temperatures than in the lowlands
- E.g.; Kandy: just over 200 C
- Hatton: less than 200C
- Nuwara Eliya: around 15.90 C
- Rainfall is spread year round
- Average annual rainfall is around 3000 mm
- Southwest Monsoons and Convections bring heavy rainfall
- Evergreen rain forests can be seen e.g. Sinharaja forest
- Area is vulnerable to floods and landslides

Highland Dry Zone

- Due to altitude temperatures are less than in the lowland dry zone regions
- Average annual rainfall is between 1500 – 2000 mm. In the highlands like the Knuckles rainfall is around 3000mm.
- More rainfall is received during the Northeast monsoon.
- Dry weather prevails during much of the year due to its leeward location

Semi-Arid Zone

- Average annual rainfall is less than 1250 mm.
- Temperature is slightly higher than in other areas of the island.
- A longer drought period prevails.
- Aridity occurs due to high temperatures and cloudless skies.

(iv) Discuss in brief **three** unique characteristics of Sri Lanka's climate. **(06 marks)**

(3 x 2 = 06 marks)

Unique characteristics of Sri Lanka's climate

Tropical Monsoon Climate:

Sri Lanka experiences a tropical monsoon climate, characterized by two distinct monsoon seasons: the Southwest Monsoon (May–September) and the Northeast Monsoon (December–February). These monsoons bring seasonal rainfall, with the southwest providing heavy rains to the wet zone and the northeast to the dry zone.

Spatial variations in climate :

In spite of the small size of the country. Existence of wet, dry, temperate semi-arid climates, absence of extreme climatic conditions

The absence of extreme climatic conditions:

Therefore, no extra cost has to be borne due to extreme climatic conditions.

Microclimatic Variations:

Despite its small size, Sri Lanka exhibits significant microclimatic variations due to its topography. The central highlands influence rainfall, temperature, and wind patterns, resulting in diverse climatic zones such as the wet zone, dry zone, and intermediate zone within short distances.

Favorable climate for life:

To sustain life of people, animals and plants.

Diversity in human activities based on climate:

According to climatic conditions

Agricultural Seasons Based on Rainfall:

Sri Lanka's agriculture is influenced by two distinct monsoon seasons: the Southwest Monsoon and the Northeast Monsoon, which bring seasonal rainfall. The agricultural seasons aligned with these monsoons are known as the Yala season and the Maha season.

Part II – Human Geography

Question 05

5. Table 1 shows the Crude Birth Rate of the world and its major regions during the period from 1950-1955 to 2015-2020. Answer the questions using the information given in the table.

Table 1: The Crude Birth Rate of the world and its major regions
1950-1955 – 2015-2020

Region	1950-1955	1970-1975	1990-1995	2010-2015	2015-2020
Africa	47.9	46.0	40.5	35.9	33.5
Asia	42.0	34.9	24.2	17.6	16.4
Europe	21.5	15.6	11.5	10.9	10.4
Latin America And the Caribbean	42.5	35.0	25.7	17.7	16.5
North America	24.4	15.6	15.3	12.4	11.8
Oceania	27.8	23.9	19.8	17.4	16.7
World	36.9	31.5	24.2	19.5	18.5

Source: Statista.com/statistics/805069/Birth'rate-worldwide

(i) What is meant by Crude Birth Rate? **(02 marks)**

The crude birth rate indicates the number of live births per 1000 population in a given year. The population in a given year is the mid-year population in that year.

$$\frac{\text{Number of live births in a year}}{\text{Mid Year Population}} \times 1000$$

(ii) Describe in brief the geographical pattern in the crude birth rate among the major regions of the world with **three** examples. **(06 marks)**

(3 x 2 = 06 marks)

- During the period 2015-2020, the lowest crude death rate in the World was in Europe.
- During the same period, the highest crude death rate in the World was in Africa.
- When compared with the World's average, the crude birth rates in Asia, Latin America and the Caribbean, and Oceania were close to the World's average.
- Only a little gap in CBR between Europe and North America is seen.
- When compared with other regions, Africa is distinctive in terms of CBR.

(iii) Describe in brief **three** trends in the crude birth rate in the major regions of the world during the relevant period citing examples **(06 marks)**
(3 x 2 = 06 marks)

- During the period from 1950-55 to 2015-2020, the crude death rate in all the regions has declined clearly.
- However, when compared to the World's average the respective standings of the regions have not changed during the said period.
- During the period 1950-55, Africa had the highest crude birth rate and it remained so even during the period 2015-2020.
- During the period, the lowest crude birth rate was recorded from Europe and it was the same in the period 2015-2020, too.
- Also, the declines in the crude Birth rate in the regions have occurred unevenly.
- The lowest percentage decline has occurred in Africa (29.8%).
- In Asia and Latin America and the Caribbean the highest percentage decline in crude birth rate has occurred (61%).

(iv) Examine **three** major problems faced by a country with a high birth rate. **(06 marks)**
(3 x 2 = 06 marks)

- The child dependency ratio increases due to the high birth rate.
- Due to the increase in child population, the expenditure on education and health will increase.
- In developing countries, the expenditure on health, sanitation, and nutrition programmes will increase.
- In the near future the expenditure on the creation of job opportunities will increase.
- The increasing population will be a burden to the labour force.
- In some instances, the death rate of the population might increase due to poor health and sanitation.
- This would result in the shortening of the life span of the people.

Question 06

(i) What is a multi-national company? (02 marks)

- Multinational company (MNC), any corporation that is registered and operates in more than one country at a time.
- Generally, the company has its headquarters in one country. Most frequently a rich country.

(ii) Describe in brief **three** factors which contributed to the distribution of multi - national companies over the world. **(06 marks)**

(3 x 2 = 06 marks)

Multinational companies (MNCs) spread across the world for a number of factors, including:

Economies of scale

MNCs can produce goods and services in larger quantities, which lowers production costs and allows for more competitive pricing.

Access to new markets

MNCs can identify potential markets and sell there.

Risk management

MNCs can diversify their operations across different industries and regions, avoiding their risks.

Tax incentives

MNCs can set up in countries with low corporation tax rates, or countries that offer tax breaks.

Labor costs

MNCs can locate production facilities in countries where labor costs are low.

Low transportation costs

MNCs can set up facilities closer to their customers, which reduces transportation costs.

Technological advances

Technological advances can enable management of faraway regions.

Development in communication

Due to the development in communication technologies, possibility to comprehend swiftly new business opportunities.

(iii) Discuss **three** problems encountered by multi-national companies at present.

(06 marks)

(3 x 2 = 06 marks)

Multinational companies (MNCs) face many problems, including:

Cultural differences:

MNCs must navigate cultural differences barriers when managing a diverse workforce.

Regulatory compliance:

MNCs must comply with different financial regulations, tax laws, consumer protection, copyright, and data privacy issues in different countries.

Talent management:

MNCs must attract, retain, and develop top talented people across different markets, industries, and regions.

Supply chain disruptions:

MNCs face challenges with long supply chains.

Currency fluctuations:

MNCs face challenges with currency fluctuations.

Competition:

MNCs face competition in the global market.

Organizational complications:

MNCs are prone to organizational complications arising from their scale, size, and geographical spread.

Internationalization risks:

MNCs may face internationalization risks, such as a fear of an unknown culture and market.

(iv) Examine how multi-national companies contribute to the economic progress of the developing countries with **three** examples.

(06 marks)

(3 x 2 = 06 marks)

Multinational corporations (MNCs) can contribute to the development of developing countries in several ways, including:

Employment

MNCs create jobs and can increase the standard of living for workers. They may also pay higher wages than local firms.

Technology

MNCs can introduce new technologies, production methods, and managerial practices to local industries. They can also facilitate technological transfer to developing nations.

Exports

MNCs can support exports of developing countries and lessen import dependence.

Research and development

MNCs can benefit from huge research and development funds that go towards technological advancements.

Economic growth

MNCs bring much-needed money into a developing nation.

Question 07

(i) What is meant by subsistence agriculture. **(02 marks)**

- Subsistence agriculture is practiced mainly for local or family consumption.
- A system of farming that provides mainly for the consumption of the farm family usually without any significant surplus for sale.

(ii) Describe in brief **three** characteristics of the subsistence agriculture in Sri Lanka. **(06 marks)**

(3 x 2 = 06 marks)

Characteristics of the subsistence agriculture in Sri Lanka.

Cultivation of food crops:

Paddy, vegetables, and other food crops (cereals such as green gram, cowpea, maize and onions, and other root crops in Sri Lanka).

Cultivation in small and medium-sized land units:

Smallholdings in Sri Lanka consist of small scale and subsitence operations.

The research has identified the the average size of smallholding in agriculture is between ha. 1 to 0.5.

Labour intensiveness:

The practice of using a lot of labor to cultivate a small plot of land.

Mixed farming:

Mixed farming in Sri Lanka is an agricultural practice that combines growing crops and raising livestock on the same farm. It can provide economic and environmental benefits.

Utilization of both family labour and animal labor:

About 30% of women employed in Sri Lanka work in the subsistence agriculture. Also use of animal labour is very common.

It requires little capital:

The low productivity of subsistence agriculture is partly due to the low investment by the farmers as they expect only a production sufficient for the needs of family.

Farmers use traditional tools:

The farmers in subsistence agriculture in Sri Lanka use various traditional tools. For example "Nagula" is used to plough the land before cultivation. "Vee Bissa" is used for storing the production. "Kevita" and "Viyagasa" are used for the use of bulls in cultivation.

Use of traditional practices:

The farmers involved in subsistence farming apply various traditional practices from from cleaning the land and canals to ploughing the field getting the labour and to stroring the harvest.

(iii) Discuss **two** traditional irrigation methods practiced in the agriculture in Sri Lanka.

(06 marks)

(2 x 3 = 06 marks)

Sri Lanka practices two traditional irrigation methods with a long history of irrigation technology.

Gravity Irrigation

- Gravity irrigation in Sri Lanka is a system of tanks and reservoirs that store rainwater and surface runoff to irrigate paddy fields through several irrigations canals. This system is called the tank cascade system.
- Sri Lanka has thousands of tanks with a wide range of sizes extending from gigantic tanks (Parakrama Samudraya in Polonnaruwa) to tanks with very small areas (Hurulu Wewa in Puttalam).
- The system originated before 1st BCE. The first tank in Sri Lanka was Basawakkulama, built by King Pandukabaya.
- This system made agriculture possible in the dry zone in Sri Lanka.
- This system has fallen into disuse due to poor maintenance.
- Efforts have been made to restore the system since independence.
- The restoration of this system is necessary as part of the climate change preparedness.

Lift Irrigation

- This method is used for supplying water to highland areas. The water is drawn through agricultural wells and Artesian wells.
- To lift water, sheaves, Andiya method, water wheels and various pumps are used and various methods are used to provide water for crop lands.
- Rajangana, located in the northwestern province has the unique feature of lift irrigation.

- Iranamadu Lift Irrigation System is in the northern province. It's the largest irrigation system in the province.
- Least successful irrigation method when compared with the gravity irrigation system in Sri Lanka.

(iv) Examine **three** challenges faced by agriculture in Sri Lanka **(06 marks)**

(3 x 2 = 06 marks)

Agriculture in Sri Lanka faces various challenges.

Loss of agricultural land and degradation

Although paddy lands and homesteads were expanded in the Dry Zone due to the Mahaweli Development Programme, in the Wet Zone paddy lands are being used for other purposes. Also, coconut land is being used for building construction and other development activities in urban areas.

Import of food products

The reduction or removal of import duties in certain periods have affected the local agriculture adversely. e.g. Potato and Big onion cultivation

Unfavorable weather conditions

Harvests have been destroyed due to drought, high rainfall, soil erosion, landslides, siltation of waterways.

Backward technology and techniques

Yields have declined and wasted due to the non-development of technologies appropriate to local agriculture, soil conditions and environmental factors. It is important to introduce new technology to prevent the effects of the labor shortage created by the withdrawal of youth from agriculture.

Increase in the cost of production

In recent times the cost of production has increased. The increase in the cost of imported inputs has been a reason; cost of chemical fertilizers, insecticides, and agricultural implements have increased.

Marketing problems

Marketing problems in agricultural products are mostly seen in respect of vegetables, fruits and grains. - In the commercial agriculture, too, marketing problems can be seen. - These problems could be seen within the country as well in international markets. - If the producer fails to get a reasonable price for his product a problem arises. It is also a problem when consumers fail to purchase goods at reasonable prices. In such situations it is the middle-men who reap the benefits.

Wild life

Wildlife has a significant impact on agriculture in Sri Lanka, causing crop damage, land damage and threatening the safety of farmers: The most threatening animals are: Toque macaques, Wild boars, Elephants, Peafowls, Giant squirrels, and Porcupines.

Question 08

Table 2 shows the coal reserves (2020) and coal production (2021) of the world by countries. Based on the data in the table answer the following questions.

Table 2: World reserves of coal (2020) and production (2021) by countries.

Country	Reserves Million metric tons (2020)	Percent of world total reserve (%) (2020)	Production Million metric tons (2021)	Percent of world total production (%) (2021)
USA	248 941	23.2	528	6.6
Russia	162 166	15.1	435	5.4
Australia	150 227	14.0	467	5.7
China	143 197	13.3	4 126	51.2
India	111 052	10.3	762	9.5
Germany	35 900	3.3	126	1.6
Indonesia	34 869	3.3	614	7.6
Ukraine	34 375	3.2	25	0.3
Poland	28 395	2.6	107	1.3
Kazakhstan	25 605	2.4	89	1.1
Other countries	99 381	9.3	788	9.7
World	1 074 108	100.0	8 067	100.0

Sources: BP Statistical Review of World Energy, 2021

(i) Briefly state how coal is formed. **(02 marks)**

- Coal is a fossil fuel. It contains energy stored by plants and remnants of animals.
- It is formed by the decay of plant and animal matter that lived hundreds of millions of years ago in swampy forests.
- When the decayed plant matter lays in between rock layers for over millions of years, thick layers of carbon are formed. The resulting pressure and heat turned the plants into the substance we call coal.
- Geologists think that coal was formed during the Carboniferous era about 300 million years ago.

(ii) Describe in brief **three** salient features in the distribution of the coal reserves in the world shown in Table 2. **(06 marks)**

(3 x 2 = 06 marks)

- Coal exists in almost every region of the world.
- Large countries have a higher possibility of inheriting coal reserves.
- Over 75% of coal reserves are in five large countries namely USA, Russia, Australia, China and India.

- 10 countries have more than 90% of coal reserves.
- USA and Russia dominate in the coal reserves.
- Middle east countries where petroleum exists don't inherit coal reserves.

(iii) Briefly discuss **three** salient features in production of coal in the world shown in Table 2. **(06 marks)**

(3 x 2 = 06 marks)

- China dominates in the production of coal in 2021, with more than 50% of total world coal production.
- USA, Russia, Australia and India make a lower contribution to total world coal production, though they have high coal reserves.
- Apart from China, India and Indonesia are the large producers of coal in the year 2021.
- The coal production in 2021 was less than 1 percent of proven reserves in the World. Accordingly, coal reserves can be used for about 100 years.
- The highest producer of coal in the year 2021 was China. It may generate unfavourable results.

(iv) Discuss **three** problems associated with coal as a mining industry. **(06 marks)**

(3 x 2 = 06 marks)

- Coal mining activities are risky, and the coal mining industry is related to disasters.
- Coal mines and coal plants have caused destruction on the climate and related environment.
- Coal use is associated with different types of air pollution.
- Environmental problems include land subsidence and damage to the water bodies.
- The mining and utilization of coal have given rise to public health risks.
- Increasing depth of mines.
- Increasing number of accidents associated with coal mines.
- Decreasing demand for human labor in coal mining activities.
- Increasing production costs.
- Conflicts between states as well as companies and local people.

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