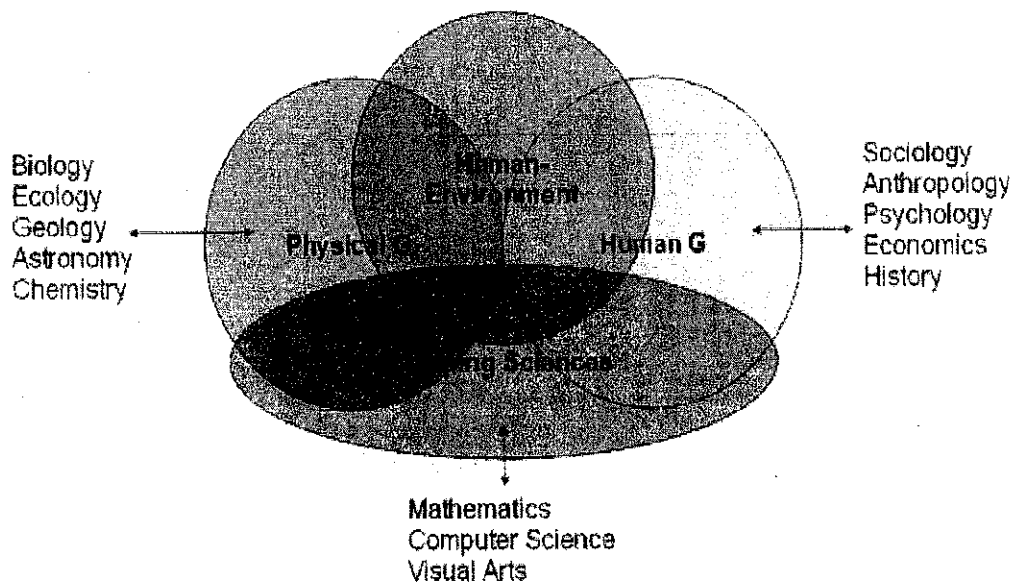




Department of Examinations - Sri Lanka  
G.C.E. (A/L) Examination - 2018

## 22 - Geography

### Marking Scheme



This document has been prepared for the use of Marking Examiners. Some changes would be made according to the views presented at the Chief Examiners' meeting.

Amendments to be included



## උත්තරපත්‍ර ලකුණු කිරීමේ පොදු ශිල්පීය ක්‍රම

උත්තරපත්‍ර ලකුණු කිරීමේ හා ලකුණු ලැයිස්තුවල ලකුණු සටහන් කිරීමේ සම්මත ක්‍රමය අනුගමනය කිරීම අනිවාර්යයෙන් ම කළ යුතුවේ. ඒ සඳහා පහත පරිදි කටයුතු කරන්න.

1. උත්තරපත්‍ර ලකුණු කිරීමට රතුපාට බෝල් පොයින්ට් පෑනක් පාවිච්චි කරන්න.
2. සෑම උත්තරපත්‍රයකම මුල් පිටුවේ සහකාර පරීක්ෂක සංකේත අංකය සටහන් කරන්න.

ඉලක්කම් ලිවීමේදී පැහැදිලි ඉලක්කමෙන් ලියන්න.

3. ඉලක්කම් ලිවීමේදී වැරදුණු අවස්ථාවක් වේ නම් එය පැහැදිලිව තනි ඉරකින් කපා හැර නැවත ලියා කෙටි අත්සන යොදන්න.
4. එක් එක් ප්‍රශ්නයේ අනු කොටස්වල පිළිතුරු සඳහා හිමි ලකුණු ඒ ඒ කොටස අවසානයේ  $\Delta$  ක් තුළ ලියා දක්වන්න. අවසාන ලකුණු ප්‍රශ්න අංකයත් සමඟ  $\square$  ක් තුළ, භාග සංඛ්‍යාවක් ලෙස ඇතුළත් කරන්න. ලකුණු සටහන් කිරීම සඳහා පරීක්ෂකවරයාගේ ප්‍රයෝජනය සඳහා ඇති කීරුව භාවිත කරන්න.

උදාහරණ : ප්‍රශ්න අංක 03

|       |  |   |                         |
|-------|--|---|-------------------------|
| (i)   |  | ✓ | $\triangle \frac{4}{5}$ |
|       |  |   |                         |
|       |  |   |                         |
| (ii)  |  | ✓ | $\triangle \frac{3}{5}$ |
|       |  |   |                         |
|       |  |   |                         |
| (iii) |  | ✓ | $\triangle \frac{3}{5}$ |
|       |  |   |                         |
|       |  |   |                         |

03

(i)

$\frac{4}{5}$

+

(ii)

$\frac{3}{5}$

+

(iii)

$\frac{3}{5}$

=

$\frac{10}{15}$

### බහුවරණ උත්තරපත්‍ර : (කවුළු පත්‍රය)

1. අ.පො.ස. (උ.පෙළ) හා තොරතුරු තාක්ෂණ විභාගය සඳහා කවුළු පත්‍ර දෙපාර්තමේන්තුව මගින් සකසනු ලැබේ. නිවැරදි වරණ කපා ඉවත් කළ සහතික කරන ලද කවුළුපතක් ඔබ වෙත සපයනු ලැබේ. සහතික කළ කවුළු පත්‍රයක් භාවිත කිරීම පරීක්ෂකගේ වගකීම වේ.
2. අනතුරුව උත්තරපත්‍ර හොඳින් පරීක්ෂා කර බලන්න. කිසියම් ප්‍රශ්නයකට එක් පිළිතුරකට වඩා ලකුණු කර ඇත්නම් හෝ එකම පිළිතුරක්වත් ලකුණු කර නැත්නම් හෝ වරණ කැපී යන පරිදි ඉරක් අඳින්න. ඇතැම් විට අයදුම්කරුවන් විසින් මුලින් ලකුණු කර ඇති පිළිතුරක් මකා වෙනත් පිළිතුරක් ලකුණු කර තිබෙන්නට පුළුවන. එසේ මකන ලද අවස්ථාවකදී පැහැදිලිව මකා නොමැති නම් මකන ලද වරණය මත ද ඉරක් අඳින්න.
3. කවුළු පත්‍රය උත්තරපත්‍රය මත නිවැරදිව තබන්න. නිවැරදි පිළිතුර ✓ ලකුණකින් ද, වැරදි පිළිතුර 0 ලකුණකින් ද වරණ මත ලකුණු කරන්න. නිවැරදි පිළිතුරු සංඛ්‍යාව ඒ ඒ වරණ තීරයට පහළින් ලියා දක්වන්න. අනතුරුව එම සංඛ්‍යා එකතු කර මුළු නිවැරදි පිළිතුරු සංඛ්‍යාව අදාළ කොටුව තුළ ලියන්න.

**ව්‍යුහගත රචනා හා රචනා උත්තරපත්‍ර :**

1. අයදුම්කරුවන් විසින් උත්තරපත්‍රයේ හිස්ව තබා ඇති පිටු හරහා රේඛාවක් ඇඳ කපා හරින්න. වැරදි හෝ නුසුදුසු පිළිතුරු යටින් ඉරි අඳින්න. ලකුණු දිය හැකි ස්ථානවල හරි ලකුණු යෙදීමෙන් එය පෙන්වන්න.
2. ලකුණු සටහන් කිරීමේදී ඔවර්ලන්ඩ් කඩදාසියේ දකුණු පස තීරය යොදා ගත යුතු වේ.
3. සෑම ප්‍රශ්නයකටම දෙන මුළු ලකුණු උත්තරපත්‍රයේ මුල් පිටුවේ ඇති අදාළ කොටුව තුළ ප්‍රශ්න අංකය ඉදිරියෙන් අංක දෙකකින් ලියා දක්වන්න. ප්‍රශ්න පත්‍රයේ දී ඇති උපදෙස් අනුව ප්‍රශ්න තෝරා ගැනීම කළ යුතුවේ. සියලු ම උත්තර ලකුණු කර ලකුණු මුල් පිටුවේ සටහන් කරන්න. ප්‍රශ්න පත්‍රයේ දී ඇති උපදෙස්වලට පටහැනිව වැඩි ප්‍රශ්න ගණනකට පිළිතුරු ලියා ඇත්නම් අඩු ලකුණු සහිත පිළිතුරු කපා ඉවත් කරන්න.
4. පරීක්ෂාකාරීව මුළු ලකුණු ගණන එකතු කොට මුල් පිටුවේ නියමිත ස්ථානයේ ලියන්න. උත්තරපත්‍රයේ සෑම උත්තරයකටම දී ඇති ලකුණු ගණන උත්තරපත්‍රයේ පිටු පෙරළමින් නැවත එකතු කරන්න. එම ලකුණු ඔබ විසින් මුල් පිටුවේ එකතුව ලෙස සටහන් කර ඇති මුළු ලකුණට සමාන දැයි නැවත පරීක්ෂා කර බලන්න.

**ලකුණු ලැයිස්තු සකස් කිරීම :**

මෙවර සියලු ම විෂයන්හි අවසාන ලකුණු ඇගයීම් මණ්ඩලය තුළදී ගණනය කරනු නොලැබේ. එබැවින් එක් එක් පත්‍රයට අදාළ අවසාන ලකුණු වෙන වෙනම ලකුණු ලැයිස්තුවලට ඇතුළත් කළ යුතු ය. I පත්‍රයට අදාළ ලකුණු ලකුණු ලැයිස්තුවේ "I වන පත්‍රය" තීරුවේ ඇතුළත් කර අකුරෙන් ද ලියන්න. අදාළ විස්තර ලකුණු ඇතුළත් කර "II වන පත්‍රය" තීරුවේ II පත්‍රයේ අවසාන ලකුණු ඇතුළත් කරන්න. 51 විත්‍ර විෂයයේ I, II හා III පත්‍රවලට අදාළ ලකුණු වෙන වෙනම ලකුණු ලැයිස්තුවල ඇතුළත් කර අකුරෙන් ද ලිවිය යුතු වේ.

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සියලු ම හිමිකම් ඇවිරිණි / முழுப் பதிப்புரிமையுடையது / All Rights Reserved

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව  
இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம்  
Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාග, 2018 අගෝස්තු  
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர) பரீட்சை, 2018 ஓகஸ்ட்  
General Certificate of Education (Adv. Level) Examination, August 2018

29.08.2018 / 1300 – 1500

භූගෝල විද්‍යාව I  
புவியியல் I  
Geography I

22 E I

පැය දෙකයි  
இரண்டு மணித்தியாலம்  
Two hours

Index No. : .....

#### Instructions:

- \* This paper consists of two parts.
- \* Part I consists of 30 multiple choice questions. Answers to Part I should be written on this paper itself.
- \* Answer scripts of both Part I and Part II, should be attached together and handed over.

For Examiner's use only.

|         | Question No. | Marks |                           | Signature | Code Number |
|---------|--------------|-------|---------------------------|-----------|-------------|
| Part I  | 1 - 30       |       | 1 <sup>st</sup> Examiner  |           |             |
| Part II | 1            |       | 2 <sup>nd</sup> Examiner  |           |             |
|         | 2            |       | Additional Chief Examiner |           |             |
|         | 3            |       | Chief Examiner            |           |             |
| Total   |              |       | Arithmetic Checker        |           |             |

#### Part I

- Select the option that contains the correct answer for each question and write its number on the dotted line.
- Two physical features that can be shown in a topographic map are  
 (1) river meander and escarpment. (2) rainfall and paddy land.  
 (3) main roads and slopes. (4) scrubs and ruins.  
 (5) swamps and railways. (.....)
  - Two geographical features that can be represented by broken lines in a topographic map are  
 (1) stream and minor road. (2) footpath and local authority boundary.  
 (3) built-up area and watershed. (4) tunnel and cart track.  
 (5) ferry and irrigation canal. (.....)
  - Three sources of secondary data are  
 (1) satellite image, news papers and census reports.  
 (2) diaries, aerial photographs and observations.  
 (3) television programmes, weather reports and questionnaire surveys.  
 (4) annual reports, labour force surveys and interviews.  
 (5) soil map, weather reports and group discussions. (.....)
  - Which one of the following items is most suitable to be represented by a flow map?  
 (1) Population density (2) Passenger transport  
 (3) Rainfall variation (4) Paddy yield  
 (5) Location of towns (.....)

5. The vector data model in Geographic Information System (GIS) is based on  
 (1) pixels. (2) lines. (3) points.  
 (4) polygons. (5) coordinates. (.....)
6. What are the two main types of data in a Geographic Information System?  
 (1) Vector and Raster (2) Spatial and Attributes  
 (3) Continuous and Discrete (4) Locational and Discrete  
 (5) Attributes and Raster (.....)
7. The main spatial data capturing methods in Geographic Information System are  
 (1) screen digitising, Global Positioning System and satellite data.  
 (2) Google data, Global Positioning System and secondary data.  
 (3) Global Positioning System, secondary data and satellite data.  
 (4) screen digitising, secondary data and Google data.  
 (5) satellite data, Google data and secondary data. (.....)
8. Which of the following is an example for spatial data?  
 (1) Total population in a city  
 (2) Time of a particular event  
 (3) Contour lines  
 (4) Quality of water of agro-wells in a region  
 (5) Daily rainfall and temperature data in a city (.....)
9. What are the two main branches of statistics?  
 (1) Descriptive statistics and Inferential statistics  
 (2) Central tendency and Dispersion  
 (3) Sample and Population  
 (4) Histogram and Frequency polygon  
 (5) Range and Inter Quartile Range (.....)
10. Which of the following options represents qualitative data?  
 (1) Height of a group of students (2) Public opinions on private education  
 (3) Results of a competition (4) Spot heights  
 (5) Mobile phone numbers (.....)
11. What is the option that shows three metamorphic rocks?  
 (1) Quartzite, Marble, Schist (2) Quartzite, Schist, Basalt  
 (3) Marble, Schist, Basalt (4) Olivine, Marble, Granite  
 (5) Granite, Quartzite, Gneiss (.....)
12. Three topographical features found in a river valley are  
 (1) floodplain, delta and ox-bow lakes.  
 (2) alluvial fans, delta and pot holes.  
 (3) levees, ox-bow lakes and yardang.  
 (4) braided stream, floodplain and inselberg.  
 (5) meanders, ox-bow lakes and bahadas. (.....)
13. Three topographical landforms created by waves are  
 (1) headland, sea stacks and cliff. (2) sea stacks, kames and levee.  
 (3) cliff, pothole and delta. (4) arches, cliff and wadis.  
 (5) cliff, headland and sheet erosion. (.....)
14. What is the salient feature of Low country wet-zone in Sri Lanka?  
 (1) Annual rainfall is more than 2000 mm  
 (2) Average annual temperature is 20 °C  
 (3) Receives rainfall from cyclones  
 (4) Cloudless clear sky  
 (5) Long dry season (.....)

15. One of the major characteristics of tropical rainforests in Sri Lanka is  
(1) closely grown tall trees.  
(2) leaves at the ground level being small.  
(3) not having several vegetation strata.  
(4) low floral diversity.  
(5) May - September being the drought season. (.....)
16. Which of the following options correctly indicates the vertical change in temperature in the mesosphere?  
(1) Increases (2) Decreases  
(3) No change (4) Become zero  
(5) Fluctuates (.....)
17. Which of the following answers shows the correct order of organizational levels in the biosphere?  
(1) Species, community, population, ecosystems, biomes  
(2) Species, population, community, ecosystems, biomes  
(3) Species, population, community, biomes, ecosystems  
(4) Species, community, ecosystems, biomes, population  
(5) Species, ecosystems, community, population, biomes (.....)
18. Three major processes of river erosion are  
(1) corrosion, saltation, hydraulic action.  
(2) corrosion, transportation, hydraulic action.  
(3) corrosion, abrasion, hydraulic action.  
(4) corrosion, sliding, hydraulic action.  
(5) abrasion, saltation, hydraulic action. (.....)
19. The El Niño phenomenon begins in the  
(1) Eastern part of the Pacific Ocean.  
(2) Western part of the Pacific Ocean.  
(3) Eastern part of the Indian Ocean.  
(4) Western part of the Indian Ocean.  
(5) Southern part of the Indian Ocean. (.....)
20. The Coriolis force is caused by the  
(1) inclination of the earth.  
(2) rotation of the earth.  
(3) oscillation of the Inter Tropical Convergence Zone.  
(4) La-niña phenomena  
(5) changes in temperature in land and ocean surface. (.....)
21. The two most important factors that determine the location of handicraft industries in Sri Lanka are  
(1) land and raw-materials. (2) labour and raw-materials.  
(3) energy and capital. (4) capital and transportation.  
(5) capital and market. (.....)
22. Which of the following options shows three salient features of an expansive population pyramid?  
(1) Convex shape, narrow bottom, expanded top  
(2) Dome shape, expanded bottom, narrow top  
(3) Concave shape, expanded bottom, narrow top  
(4) Lean shape, narrow bottom, narrow top  
(5) Oval shape, narrow bottom, expanded top (.....)

23. Three tourist locations in the east coast region of Sri Lanka are  
 (1) Nilaveli, Pasikuda and Casuarina beach.  
 (2) Nilaveli, Pasikuda and Arugam Bay.  
 (3) Casuarina beach, Arugam Bay and Nilaveli.  
 (4) Dambakolapatuna, Casuarina beach and Nilaveli.  
 (5) Nilaveli, Pasikuda and Dambakolapatuna. (.....)
24. A recent trend in urban settlements in Sri Lanka is  
 (1) high rate of urban growth.  
 (2) high urban growth in district capitals.  
 (3) de-industrialization in Colombo suburbs.  
 (4) development of Colombo as a metropolis.  
 (5) less migration to Greater Colombo Metropolitan Region. (.....)
25. Three main characteristics of tribal groups are  
 (1) speak same language, have common habits and living in a small area.  
 (2) speak different languages, have common habits and living in a small area.  
 (3) speak same language, have various habits and living in a small area.  
 (4) speak different languages, have various habits and living in different areas.  
 (5) speak different languages, having common habits and living in different areas. (.....)
26. Which of the following answers correctly shows, in descending order, four crops in Sri Lanka in terms of land area cultivated?  
 (1) Tea, Rubber, Paddy, Coconut (2) Coconut, Tea, Paddy, Rubber  
 (3) Paddy, Tea, Coconut, Rubber (4) Tea, Paddy, Rubber, Coconut  
 (5) Paddy, Coconut, Tea, Rubber (.....)
27. By 2050, the most urbanized continent in the world will be  
 (1) Africa. (2) Asia. (3) Europe.  
 (4) North America. (5) Latin America. (.....)
28. The general fertility rate is the number of live births  
 (1) per 100 females in the age group 15 – 50 in a given year.  
 (2) per 1000 females in the age group 15 – 49 in a given year.  
 (3) per 100 females in the age group 14 – 50 in a given year.  
 (4) per 1000 females in the age group 18 – 49 in a given year.  
 (5) per 100 females in the age group 18 – 50 in a given year. (.....)
29. Which of the following options correctly indicates the two townships that belong to the Mahavali settlement systems 'H' and 'G' respectively?  
 (1) Thambuttegama and Dehiattakandiya  
 (2) Girandurukotte and Bakamuna  
 (3) Galnewa and Bakamuna  
 (4) Eppawala and Aralanganwila  
 (5) Nochchiyagama and Dehiattakandiya (.....)
30. At present the leading buyer of Graphite from Sri Lanka is  
 (1) Canada. (2) India. (3) Japan.  
 (4) United Kingdom. (5) Australia. (.....)

\* \*

**ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව**  
**இலங்கைப் பரீட்சைத் திணைக்களம்**  
**අ.පො.ස. (උ.පෙළ) විභාගය/ க.பொ.த. (உயர் தர)ப் பரீட்சை - 2018**

විෂය අංකය  
පාල. இலக்கம்

22

විෂය  
පාලම

Geography

**ලකුණු දීමේ පටිපාටිය/புள்ளி வழங்கும் திட்டம்**  
**I පත්‍රය/பத்திரம் I**

| ප්‍රශ්න අංකය<br>வினா இல. | පිළිතුරු අංකය<br>விடை இல. | ප්‍රශ්න අංකය<br>வினா இல. | පිළිතුරු අංකය<br>விடை இல. | ප්‍රශ්න අංකය<br>வினா இல. | පිළිතුරු අංකය<br>விடை இல. |
|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|
| 01.                      | 1                         | 11.                      | 1                         | 21.                      | 2                         |
| 02.                      | 2                         | 12.                      | 1                         | 22.                      | 3                         |
| 03.                      | 1                         | 13.                      | 1                         | 23.                      | 2                         |
| 04.                      | 2                         | 14.                      | 1                         | 24.                      | 4                         |
| 05.                      | 5                         | 15.                      | 1                         | 25.                      | 1                         |
| 06.                      | 2                         | 16.                      | 2                         | 26.                      | 5                         |
| 07.                      | 1                         | 17.                      | 2                         | 27.                      | 4                         |
| 08.                      | 3                         | 18.                      | 3                         | 28.                      | 2                         |
| 09.                      | 1                         | 19.                      | 2                         | 29.                      | 3                         |
| 10.                      | 2                         | 20.                      | 2                         | 30.                      | 3                         |

❖ විශේෂ උපදෙස්/ விசேட அறிவுறுத்தல் :

එක් පිළිතුරකට/ ஒரு சரியான விடைக்கு 02 ලකුණු බැගින්/புள்ளி வீதம்  
 இரண்டு ලකුණු/மொத்தப் புள்ளிகள் 2 × 30 = 60

# Geography I

## Part II

### Physical Geography

1. You are provided with a part of the 1 : 50,000 topographic map of Hanguranketa, published by the Survey Department of Sri Lanka. The contours are shown at 20 metre interval. Answer the following questions based on the map.

**N.B.**

- \* **Answers should not be written on the map.**
- \* You should clearly state the relevant **question number** and its **subsection** in the answer script.
- \* Do **not** attach the provided map to your answer script.

- (i) Name the **two** drainage features shown in quadrilaterals **A** and **B** in the map. (02 marks)
- (ii) Name the **two** topographic features shown in quadrilaterals **C** and **D**. (02 marks)
- (iii) Discuss briefly, the salient features of topography and drainage in the map area. (04 marks)
- (iv) Name **four** public services available in the area within the quadrilateral **E**. (04 marks)
- (v) Comment on the distribution pattern of human settlements in the map area. (04 marks)
- (vi) Discuss in brief the geographical factors that affect the land use pattern in the map area. (04 marks)

**Q. 1.**

- (i) A – Braided river    B - Radial drainage pattern  
(02 Marks)

- (ii) C – Rock outcrop    D – Escarpment  
(02 Marks)

**(iii) Salient Features of Topography and Drainage in the Map Area**

**Topography**

- The map shows mainly a hilly area at higher elevation.
- In the southeast corner, there are places 1000m above mean sea level. The narrow valleys are found below 160m.
- The ridges extend in north-south direction. Steep slopes and escarpments can be seen.
- The main ridge in the middle of the map area is divided by a river valley.
- In the eastern part of the northeast quarter of the map area a lowland area can be seen.
- In the western part of the area, there is a varying topography with steep slopes, narrow and wide valleys.
- There are some rock outcrops in the north-north-western part.

**Drainage**

- Map area is well drained
  - The main river flows northward through middle of the area
  - Another river enters at the eastern boundary and flows northward
  - Adapting to the topography of the area, these two rivers flow creating meanders.
  - The main river is braided
  - The branches of the main river, flow short distance in narrow valleys
  - Dendritic and radial drainage patterns are seen in the area.
  - The main river flows in a narrow valley at the center of the map area. The river valley in the east is wide.
- ( 2+2 = 04marks)

**iv) Public services available in the area within quadrilateral E**

School  
Police Station  
Hospital  
Assistant Government Agents Office/Divisional Secretariat  
Buddhist Temple

**(1x4 = 04 Marks)****(v) Distribution Pattern of Human Settlements in the Map Area**

- Human settlements are located as clusters in several places of the map area.
- More settlements are located in the area adjacent to crops cultivated lands in the eastern part of the map area.
- Two clusters of settlements are located along the main road of the map area.
- The settlements are rare in the highlands in the middle of the map area.
- The linear settlements are found along the river valleys and minor roads at the western part of the area.

**(2+2 = 04 marks)****(vi) The Geographical factors that affect the Land Use Pattern of the Map Area**

- Rugged topography, slopes and high elevations have affected the land use in the area.
- Main land uses in the area include paddy cultivation, homesteads, tea cultivation, roads and location of services.
- Utilized lands are mainly in the low lands and valleys.
- Paddy cultivation is distributed along river valleys.
- Home gardens distributed in a very limited area.
- In the eastern part of the map area there are irrigated paddy lands.

- In general, the geographical factors that affect the land use in the map area are: drainage pattern, limited availability of low lands and valleys, high elevation and slopes, distribution of roads and location of junctions.

(2+2 = 04 marks)

2. (i) Define 'Global Positioning System' (GPS). (02 marks)
- (ii) Briefly explain the main segments of a Global Positioning System. (04 marks)
- (iii) Describe **three** factors which can affect the accuracy of Global Positioning System data. (06 marks)
- (iv) Explain **four** advantages of Global Positioning System based on their application. (08 marks)

**Q. 2.**

- I. Define GPS 2 Marks
- II. Briefly explain the main segments of a GPS? 4 Marks
- III. Describe three factors which can be badly influenced for the accuracy of GPS data 6 Marks
- IV. Explain four advantages of GPS based on their applications 8 Marks

**(i) Define GPS**

GPS is a navigation system which allows users to find the, exact location of any object/feature. The GPS constellation consists of minimum 24 earth orbit satellites that transmit radio signals and allow GPS receivers to determine current location. These satellites are high orbit, circulating at 14,000km/hr and 20,200km above the earth's surface. GPS works in any weather condition, anywhere in the world, 24 hours a day, and users do not have to pay subscription fees or setup charges.

**(ii) Briefly explain the main segments of a GPS?**

There are three main segments of GPS

- Space Segment
- Control Segment
- User Segment

**Space Segment**

The Space Segment of the system consists of GPS satellites and they are called man-made stars. The Space Segment - consists of a group of minimum 24 Satellites, each on its own orbit, approximately about 20,200 km, and send radio signals from space, which allow users to determine location. The satellite orbits repeat almost the same ground track twice each day.

There are six orbital planes equally spaced (4 satellites per orbit), and inclined at about  $55^\circ$  with respect to the equatorial plane.

### **Control Segment**

The Control Segment (also referred to as Operational Control System) is responsible for the proper operation of the GPS system and it is controlled by the United States Army. The GPS Control Segment is composed by a Master Control Station (MCS), a Monitor Station (MS) and Ground Antennas.

### **User Segment**

The GPS user segment consists of GPS receivers and the user community. GPS receivers are used for navigation, positioning, time dissemination and other research. Navigation in three dimensions is the primary function of GPS. Navigation receivers are made for aircraft, ships, and ground vehicles and for hand carrying by individuals. However, the accuracy of GPS depends on the quality of the GPS receiver. It is common today to have positions indicated on GPS receiver with 1cm to few meter position accuracy

### **(iii) Describe three factors what affect the accuracy of GPS data**

#### **Atmospheric Effects**

Atmospheric conditions affect the speed of the GPS signals as they pass through the Earth's Atmosphere, especially the ionosphere (the uppermost part of the atmosphere). These effects can change due to the density of the atmosphere. Also, signal propagation delay errors caused by weather conditions in the lower atmosphere.

#### **Multipath Transmission Errors**

GPS signal does not pierce through the solid walls or structures. Moreover it is affected by large buildings or structures. Due to this, user will not be able to utilize GPS service indoors or under water or in dense tree regions or in underground stores. .

#### **Receiver clock**

GPS receivers are equipped with quartz crystal clocks that are less stable than the atomic clocks used in satellites. Receiver clock error can be eliminated, however, by comparing times of arrival of signals from two satellites.

### Number of satellites visible

Obviously the more satellites that can be seen and can be used to provide readings, the more triangulation points are obtained and the greater the level of certainty and accuracy. Minimum 4 GPS satellites are needed for determination of ground location with the GPS Receiver.

### Operator knowledge and awareness.

An awareness of the limitations in the design, controls, displays and software logic of GPS units can avoid potentially dangerous errors

- incorrect data entries
- incorrect interpretation of data
- inadequate cross-checking from alternative sources
- inappropriate decisions based on GPS output

#### (iv) Explain four advantages of GPS based on their applications

- i. Transport – Navigation, Find the destination/route, shortest path, Provide information about an approaching point of interest. With the help of GPS roads or paths available, traffic congestion and alternative routes, roads or paths that might be taken to get to the destination. If some roads are busy the best route to take, The location of food, banks, hotels, fuel, airports or other places of interests, the shortest route between the two locations, the different options to drive on highway or back roads.
  - ii. Service Management – Find the customer location (Pickme, Uber, Taxiya)
  - iii. Fisheries – Navigation, locate the fishing/harvesting sites,
  - iv. Tourism – Find the routes,
  - v. Utility Management – pipeline locations, Man hole locations,
  - vi. Tracking – Protecting VPIs
  - vii. Remote sensing - Ground Control Points
  - viii. Surveying – Land boundary Management (Bimsaviya)
1. The GPS system gets calibrated by its own and hence it is easy to be used by anyone
  2. It provides user with location based information
  3. The GPS signal is available anywhere on the globe. Hence user will not deprive of GPS facility anywhere.
  4. There is no charge for utilization GPS service. It is maintained and upgraded by US Department of Defense. It is cheaper compare to other navigational systems.

3. **Table 1** shows the average yield of paddy (kg per hectare) by districts in Sri Lanka for Maha Season in 2015. Answer the following questions based on the table.

**Table 1**

| Serial No. | District     | 2015 Maha | Serial No. | District     | 2015 Maha |
|------------|--------------|-----------|------------|--------------|-----------|
| 1          | Colombo      | 3,431     | 14         | Monaragala   | 3,993     |
| 2          | Gampaha      | 3,594     | 15         | Jaffna       | 3,096     |
| 3          | Kalutara     | 3,644     | 16         | Killinochchi | 3,689     |
| 4          | Galle        | 3,738     | 17         | Vavuniya     | 4,816     |
| 5          | Matara       | 4,266     | 18         | Mullativu    | 3,330     |
| 6          | Ratnapura    | 3,924     | 19         | Mannar       | 5,489     |
| 7          | Kegalle      | 3,857     | 20         | Anuradhapura | 4,802     |
| 8          | Kurunegala   | 3,609     | 21         | Polonnaruwa  | 5,306     |
| 9          | Puttalam     | 4,028     | 22         | Trincomalee  | 4,473     |
| 10         | Kandy        | 4,203     | 23         | Batticaloa   | 2,686     |
| 11         | Matale       | 4,602     | 24         | Ampara       | 4,078     |
| 12         | Nuwara Eliya | 3,717     | 25         | Hambantota   | 6,134     |
| 13         | Badulla      | 4,761     |            |              |           |

Source: Department of Census and Statistics Colombo Sri Lanka, 2015

- Prepare a frequency distribution table using above data. Limit the number of classes to five (5). (06 marks)
- Calculate the mean paddy yield in Maha season, 2015 using the frequency distribution table prepared in (i) above. (05 marks)
- Construct a histogram and frequency polygon using the frequency distribution prepared in (i) above. (05 marks)
- Based on the exercises done in (ii) and (iii) above, briefly describe **two** major characteristics of the average paddy yields in the Maha season of 2015 in the districts of Sri Lanka. (04 marks)

**Q. 3.**

Table 01 shows the paddy average (kg/hectare) by Districts in Sri Lanka in 2015

**Table 01:**

| Serial No. | District     | 2015 Maha | Serial No | District     | 2015 Maha |
|------------|--------------|-----------|-----------|--------------|-----------|
| 1          | Colombo      | 3,431     | 14        | Monaragala   | 3,993     |
| 2          | Gampaha      | 3,594     | 15        | Jaffna       | 3,096     |
| 3          | Kalutara     | 3,644     | 16        | Killinochchi | 3,689     |
| 4          | Galle        | 3,738     | 17        | Vavuniya     | 4,816     |
| 5          | Matara       | 4,266     | 18        | Mullativu    | 3,330     |
| 6          | Ratnapura    | 3,924     | 19        | Mannar       | 5,489     |
| 7          | Kegalle      | 3,857     | 20        | Anuradhapura | 4,802     |
| 8          | Kurunegala   | 3,609     | 21        | Polonnaruwa  | 5,306     |
| 9          | Puttalam     | 4,028     | 22        | Trincomalee  | 4,473     |
| 10         | Kandy        | 4,203     | 23        | Batticaloa   | 2,686     |
| 11         | Matale       | 4,602     | 24        | Ampara       | 4,078     |
| 12         | Nuwara eliya | 3,717     | 25        | Hambantota   | 6,134     |
| 13         | Badulla      | 4,761     |           |              |           |

Source: Agriculture and Environmental Statistical Division, Department of Census and Statistics, Colombo, Sri Lanka, 2015

- I. Prepare a frequency distribution table using equal interval method. Limit the number of classes to 5. (6 Marks)
- II. Calculate the mean yield using of the frequency distribution table prepared in I above (5 Marks)
- III. Construct a Histogram and Frequency Polygon (5 Marks)
- IV. Interpret the results (4 Marks)

03. In the allocation of marks following steps should be considered

(i)

Six steps are:

LV – 2686

HV – 6134

Range –  $6134 - 2686 = 3448$

Number of classes – 5

Interval -  $3448/5 = 689.6 \text{ ---- } 690$

1 mark

No marks are allocated

1 mark

| Class Interval | Tally                | Frequency |
|----------------|----------------------|-----------|
| 2686 - 3376    | ///                  | 03        |
| 3376 - 4066    | /// <del>///</del> / | 11        |
| 4066 - 4756    | ///                  | 05        |
| 4756 - 5446    | ////                 | 04        |
| 5446 - 6136    | ///                  | 02        |
| Total = N      |                      | 25        |

4 Marks

(ii)

| Class Interval | Frequency (f) | x    | f(x)   |
|----------------|---------------|------|--------|
| 2686 - 3376    | 03            | 3031 | 9093   |
| 3376 - 4066    | 11            | 3721 | 40931  |
| 4066 - 4756    | 05            | 4411 | 22055  |
| 4756 - 5446    | 04            | 5101 | 20404  |
| 5446 - 6136    | 02            | 5791 | 11582  |
| N              | 25            |      | 104065 |

X field – 1.5 marks

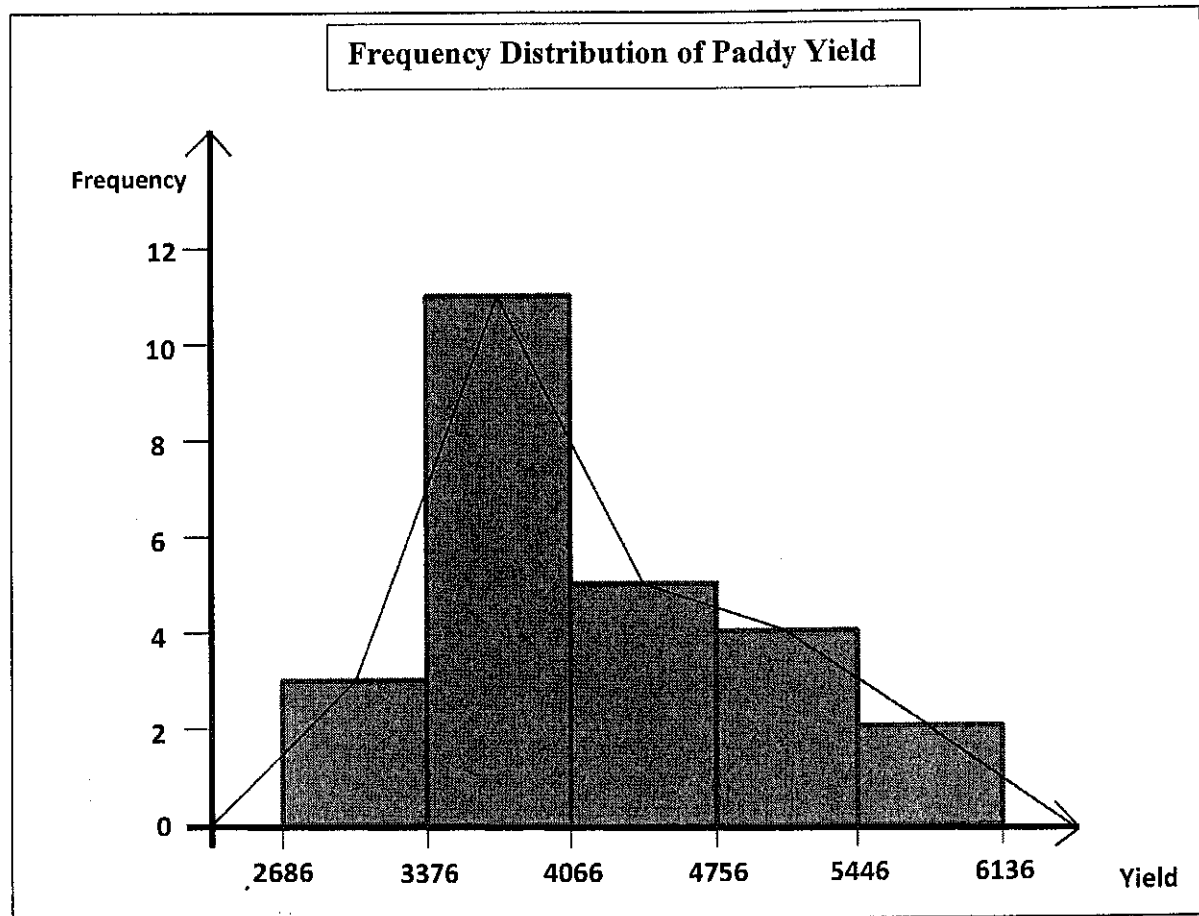
Fx – 1.5 marks

$$\text{Mean Yield} = \bar{x} = \frac{\sum fx}{\sum f} = \frac{104065}{25} = 4162.6kg$$

2 Marks

- (iii) Histogram – 4 Marks (2 marks for both axes, 2 marks for construction of bars – No gaps between bars, half a width of bar in both sides of graph)

Frequency Polygon – 1 Mark (Strait line connecting mid points of bars and ending up in the either corners of the graph)



## Geography II - Part I

### Physical Geography

1. (i) Name **four** major factors that affect the climate of Sri Lanka. (02 marks)
- (ii) Select any **two** from the factors you have mentioned in (i) above and explain how they affect the climate of Sri Lanka. (06 marks)
- (iii) Describe **three** main characteristics of the climate in the low country wet zone of Sri Lanka. (06 marks)
- (iv) Discuss **three** physical processes that induce climate change. (06 marks)

**1. (i) Name four major factors that affect the climate of Sri Lanka**

1. Sri Lanka is located within the Inter Tropical Convergence Zone (ITCZ)
2. location in the low pressure trough
3. Ocean currents
4. Located close to the Indian continent
5. The influence of the Indian Ocean
6. Location as an island
7. Presence of local changes according to topographical features, water and soil conditions

(0.5 x 4 = 02 Marks)

- (ii) Select any two from the factors you have mentioned in (i) above and explain how they affect the climate of Sri Lanka**

**1. Sri Lanka lies on the path of north and south movement of the Inter Tropical Convergence Zone (ITCZ)**

- The ITCZ which is located between 5° – 10° latitudes make a movement over Sri Lanka to the Asian continent in June and in January moves to about 10° south in the Indian Ocean
- Due to the movement in the ITCZ there is a variation in the mean pressure in the Island. (When the ITCZ moves southward pressure decreases from north to south in Sri Lanka in Jaffna it is 1012 milibars while in Galle it is 1011 milibars)

**2. location in the low pressure trough**

- There is an influence on the climate when winds blow from outside under low pressure condition in Sri Lanka
- The impact of the equatorial and sub-tropical jet stream
- That there are two air masses of high velocity which influence the south Asian zone

**3. Ocean currents**

- The influences of the North Equatorial current which flows corresponding to the trade winds from the Pacific Ocean to the Indian Ocean

**4. Located closed to the Indian sub-continent**

- The location of Sri Lanka in the Asiatic landmass including the Indian continent in the north
- Coming under the influence of winds that blow from the high pressure centers that from periodically in the Indian Thar desert and Central Asia
- Due to the relief features in India, the strength of the Trade winds that blow from north to south is reduced.

**5. The influence of the Indian Ocean**

- The influence of the moisture bearing winds
- Location of Sri Lanka relatively to Bay of Bengal
- Formation of low pressure centers very often on the surface of the Ocean

**6. Location as an Island**

- Coastal influences
- Having relief features with the height of land increasing gradually from the coast to the central parts and the presence of a Central Hill Country (Changes in temperature with increasing elevation, the Location of central hills influences rainfall)

**7. Presence of local changes according to topographical features, water and soil condition**

The influences of soil types, topographical features and drainage on local temperature variation in Sri Lanka (Sandy soil absorb much heat and releases excess heat, forest absorb more heat and release less heat, lowering of temperature by the cooling of air through evaporation in areas with an expanse of water) **(3x2 = 6 Marks)**

**(iii) Describe three main characteristics of the climate in the low country wet zone in Sri Lanka.**

- Annual rainfall is more than 2000 mm
- Rainfall is distributed throughout the year but February and August are relatively dry month with low rainfall
- Get rainfall from the south west monsoon and conventional rainfall
- Bright sunlight prevails throughout the year
- Average annual temperature is 27°C
- Plant grow well due to heavy rain and high temperature

**(3x2 = 6 Marks)**

**(iv) Discuss three physical processes that induce climate change**

- Greenhouse effect
- Temperature changes in the ocean surface
- El-Nino phenomenon
- La-Nino phenomenon
- Sun Spot Cycles
- Volcanoes

**(3x2 – Marks)**

2. (i) What is meant by landslide? (02 marks)
- (ii) Explain **three** natural factors affecting landslides. (06 marks)
- (iii) Explain **three** major impacts of landslides on the physical environment. (06 marks)
- (iv) Explain **three** measures that have been taken by the government of Sri Lanka to minimize the damage caused by landslides. (06 marks)

**(2) (i) What is meant by Landslide?****(02 Marks)**

The downward movement of rocks and other material along mountain slopes and steep slopes with loose soil due to gravity.

The intensity of this process is aggravated by human activities.

Intensity of rainfall, high level of weathering, lightening, earthquakes, relief of the land as well as human activities are the factors that cause landslides.

**(ii) Explain three (3) natural factors affecting landslides. (06 Marks)**

- **High rainfall.** Mass movements due to concentration of large volume of water on the surface with high rainfall during long periods of storm.
- **Higher rainfall intensity:** A large volume of water falling within a short period of time loosening the soil layer resulting in slow movement.
- Changing slopes of land due to geological events, glacier, running water etc.
- Loss of equilibrium of the top layer of the soil due to high weathering of rocks.
- Changes in the geological structure due to earthquakes
- Changes in the flowing pattern of ground water
- Snow melting. When snow is melted a large volume of water drains with the top layer of soil.

**(iii) Explain three (3) major impacts of landslides on the physical environment.**

- Soil degradation.
- Sedimentation of rivers.
- Sedimentation of reservoirs.
- Destruction of vegetation, forests cover of the earth's surface.
- Destruction of habitats of natural wildlife and animal species

**(2 x3 = 6 Marks)**

(iv) Explain three (3) measures that have been taken by the government of Sri Lanka to minimize the damage caused by landslides.

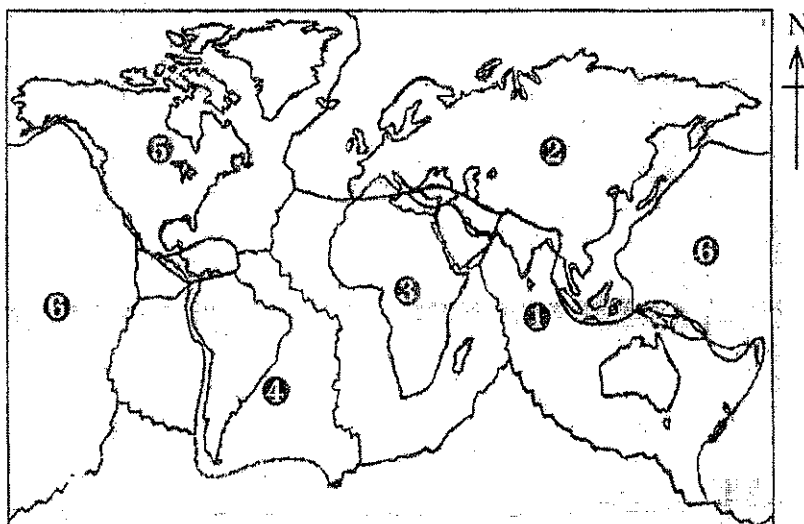
- Afforestation should be promoted and intensive grazing by domestic animals should be avoided.
- Construction of roads and dams should be restricted to fragile areas.
- People should be aware of the cause of the landslide.
- Terrace farming on the hills slows down the rate of landslides.

(2x3 = Marks)

3. (i) The world map given below shows six geo-tectonic plates numbered 1-6.

Name the six geo-tectonic plates correctly.

(03 marks)



(ii) Explain three processes taking place in the plate boundaries with suitable diagrams. (06 marks)

(iii) Name one landform type each associated with compressional and tensional forces and describe their formation process. (06 marks)

(iv) Explain two main disasters occurring on the earth surface due to plate movements. (05 marks)

(3) (i) The world map given below shows six geo-tectonic plates numbered 1 to 6. Name the six geo-tectonic plates correctly.

- (1) Indo-Australian Plate
- (2) Eurasian Plate
- (3) African Plate
- (4) South American Plate
- (5) North American Plate
- (6) Pacific Plate

(ii) Explain three processes taking place in the plate boundaries with suitable diagrams. (06 Marks)

Three kinds of plate boundaries are recognized. These define three fundamental kinds of deformation and geologic activity.

- **Divergent movements**

Divergent plate boundaries are zones of tension, where plates split and spread apart. When two plates move away from each other, the process is called a divergent movement. In the process, magma comes to the surface from the upper region of the mantle, thereby paving way to create a new ocean floor. Ex.: Mid-Oceanic Ridges.

Divergent plate boundaries are thus characterized by tensional stresses that produce block faulting, fractures, and open fissures along the margins of the separating plates.

Divergent plate boundaries are some of the most active volcanic areas on the earth.

- **Convergent movements**

Convergent plate boundaries, also called subduction zones, are zones where plates collide and one plate moves down into the mantle. Two plates move toward each other. When two plates collide the weaker plate is destroyed or land between the two plates undergoes numerous changes. As such, convergent plate boundaries are destructive. When the collision one plate submerges under the other and the pressure generated in the process results in fold mountains. Ex.: the Himalayas.

The West Coast of South America is a convergent boundary between the Nazca Plate and the South American Plate. The collision of this oceanic and continental plate was how the Andes Mountains were formed. Convergent boundaries can also form islands.

- **Transform movements**

Two plates moving parallel to each other. Transform boundaries are places where plates slide sideways past each other. At transform boundaries lithosphere is neither created nor destroyed. Many transform boundaries are found on the sea floor, where they connect segments of diverging mid-ocean ridges. California's San Andreas Fault is a transform boundary.

(iii) Name one Landform type each associated with compressional and tensional forces, and describe their formation process. (06 Marks)

- The geo-thermal convectional currents in the earth's interior emitted by the radioactive minerals result in earth movements. They are of two types: (i) Vertical movements (Epeirogenic) (ii) Horizontal (Orogenic) movements.
  - The horizontal movements are divided into two types according to the nature of their movement as follows: (1) Compressional movements. (2) tensional movements.
- (1) **Compressional force** is the thrust that occurs due to the converging forces. Compression results in folds, faults and ripples in the rock layers. Ex.: Himalayas, Rockies, Alps, Andes. Different types of folds are associated with compressional movements.

**Symmetrical fold:** A fold in which the two limbs are essentially mirror images of each other.

**Asymmetrical fold:** A fold (anticline or syncline) in which one limb dips more steeply than the other.

**Monoclinial fold:**

**Isoclinal fold:**

**Recumbent fold:**

**Overtured fold:** a fold in which at least one limb has been rotated through an angle greater than 90 degrees. This overtured fold is a huge anticlinal structure with numerous minor anticlines and synclines.

**Anticlinorium and Synclinorium:**

- (2) **Tensional force:** The landforms associated with tensional movements are as follows:

**Thrust fault:** A low-angle fault (45degrees or less) in which the hanging wall has moved upward in relation to the footwall. Thrust faults are characterized by horizontal compression rather than by vertical displacement.

**Rift valley:**

Normal fault

Step fault

Horst

Block fault

Reversed fault

Block fault

- (iv) Explain two main disasters occurring on the earth surface due to plate movements.  
(05 Marks)

- **Earthquakes:**

Earthquakes often cause dramatic changes at Earth's surface. In addition to the ground movements, other surface effects include changes in the flow of groundwater, landslides, and mudflows. Earthquakes can do significant damage to buildings, bridges, pipelines, railways, embankments, dams, and other structures

They occur mostly at plate boundaries/margins.

- Tsunami
- Landslides may occur on hill slopes
- Avalanches
- Shattering of the crust/ formation of cracks and fissures on the ground.
- Change in the nature of the water resources
- River courses may change and floods may result over a large areas.
- Loss of life/ property
- Fires, diseases and devastation of cities.
- Destruction of infrastructure facilities/ collapsing buildings and bridges.

- **Volcanic eruptions**

The sudden violence of volcanic eruptions causes catastrophe and devastation. Various eruptions of volcanoes in the past, such as Mt. Pelee, Tampora, Krakatau and Pinatubo have demonstrated the devastating impact on environment. Lava can travel very far and burn, bury, or damage anything in its path, including people, houses, and trees. The large amount of dust and ash can cause roofs to fall, makes it hard to breathe, and is normally very smelly.

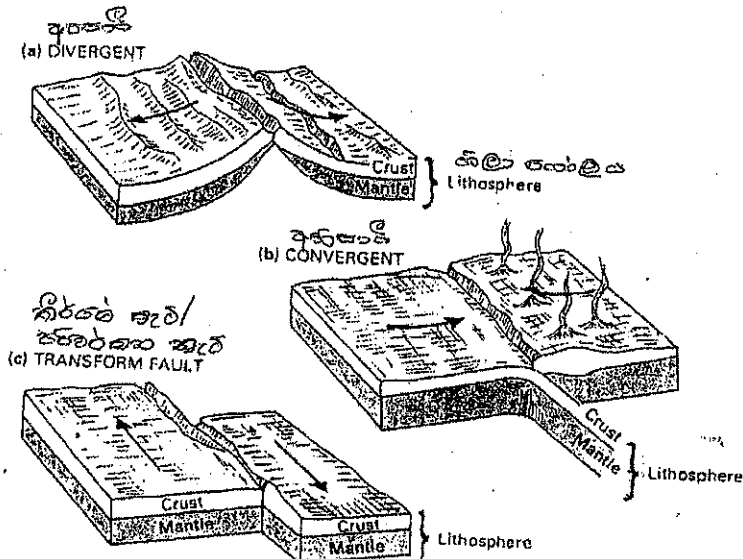
Volcanic mud flows, flooding, volcanic landslides, climate change, forest fires, destruction of farm lands, volcanic gases and ashes are the major impact of volcanic disaster. Aquatic life can be affected by an increase in acidity and turbidity, change in temperature and change in food supply.

- **Tsunami**

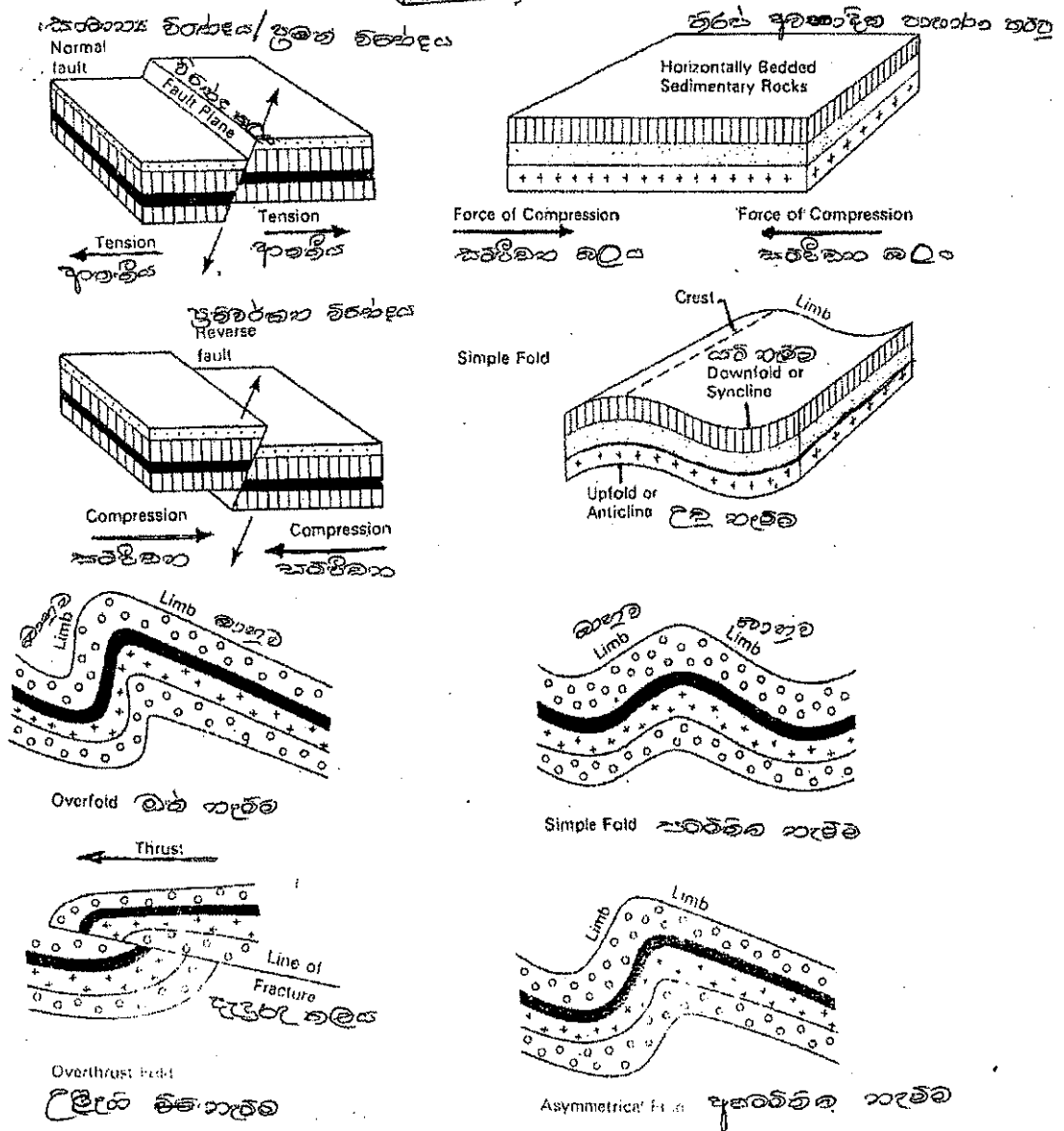
A tsunami is a series of waves or surges most commonly caused by an earthquake beneath the sea floor. Tsunamis can cause great loss of life and property damage in coastal areas. Very large tsunamis can cause damage to coastal regions thousands of miles away from the earthquake that caused them.

- Coastal areas will be affected.
- Waves destruction- buildings, properties, uprooting trees.
- Destroying transport system along the coastal areas.
- Destruction to the agricultural lands along the coastal belt.
- Displacing people and relocate their dwellings.

3(ii)



3(iii)



4. (i) Name the **two** main components of an ecosystem. (02 marks)
- (ii) Explain briefly **three** major types of natural ecosystems in Sri Lanka. (06 marks)
- (iii) Name **four** types of wildlife reserves in Sri Lanka and explain **two** major threats faced by them. (06 marks)
- (iv) Discuss **three** legal measures adopted by the government of Sri Lanka to minimize the threats faced by the wildlife reserves. (06 marks)

4. (i) **Name the two main components of an ecosystem**

- Biotic component
- Abiotic component

(ii) **Explain briefly three major types of natural ecosystems in Sri Lanka**

- Wetland ecosystems (Flood plains, Swamps, Streams and rivers, Reservoirs and ponds, - Wet Villu grasslands, Wet montane grasslands, wet patanas)
- Forest land and wildlife reserves (Tropical wet evergreen forest, lowland rain forest, Tropical moist evergreen forest, Tropical dry mixed evergreen forest, Riverine forest, Tropical sub montane forest, Tropical montane forest, Dry montane grasslands.
- Coastal and marine ecosystems (Mangroves, Salt marshes, Sand dunes and beaches, Mudflats, Sea grass beds, Lagoons and estuaries, Coral reefs)
- Lake ecosystems (Reservoirs and ponds)

(iii) **Name four types of wildlife reserves in Sri Lanka and explain two major threats face by them**

1. Strict nature reserves (Haggala, Ritigala)
2. Nature Reserves (Minneriya, Giritale)
3. National Park (Yala, Wilpattu, Udawalawa)
4. Sanctuaries (VRR Sanctuaries)

**Major Threatens to wildlife reserves**

- Deforestation
- Major Development Project
- Non timber forest product gathering
- Timber extraction and logging
- Accumulation of waste
- Poaching
- Agricultural activities
- Land encroachment
- Resettlement

**(iv) Discuss the three legal measures adopted by government of Sri Lanka to minimized the threatening issues face by the wildlife reserves**

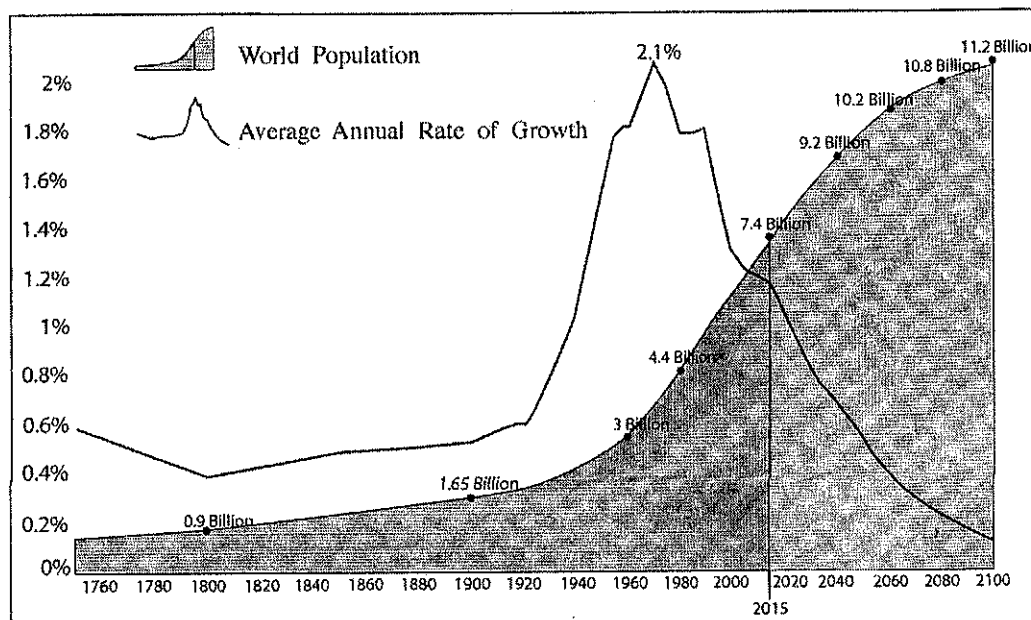
- *National Heritage Wilderness Areas Act*
  1. This is the National heritage Wilderness Area Act. No 3 of 1988
  2. The relevant Minister has the power to declare any area of state land and which in his opinion has ecological value
  3. No person shall enter in to national heritage wilderness area without permission
  4. Any act harmful to the environment of National Heritage Wilderness area is strictly prohibited
  5. Any person who acts in contravention of any provisions of the act is punished by the law
  6. Any land, even not being state land, can be acquired for the purposes of this Act.
  
- *Forest Ordinance*
  1. This was first rendered in 1907 and later amended in 1995, thus is called forest ordinance (Amended) Act, No. 25 of 1995
  2. The Act after amendment was brought forward for the Acts such as declaration of reserved forestlands, shifting forest boundaries etc.
  3. It has been declared that entrance and any act impairing the wilderness are against law.
  
- *Fauna and Flora Protection Ordinance*
  1. This was first rendered in 1937 and has been amended later
  2. This is for conservation of fauna and flora of Sri Lanka
  3. By this, any area can be declared a forbidden band of duffer zone
- *Import and Export Control Acts*
  1. Rules and regulations for exporting of forest resources and anything associated with forest are declared in the circular No 03/2001 of Ministry of Environment and Natural Resources
  2. A record of export banning was rendered with this
- *National Environment Acts.*
  1. Central Environment Authority (CEA) was established in 1980 by this Act.
  2. This Act was amended in 1988 and 2000
  3. A license from the CEA is required in any activity related to environment
  4. This indicates the intervention in maximum land use, sustainable utilization of natural resources, fishery production control, forest management, wildlife conservation, and soil conservation

## Part II – Human Geography

5. (i) Name the factors affecting population growth. (02 marks)
- (ii) Examine **three** factors that have been responsible for the rapid growth of population in the world that took place since the mid-1990s as shown in the Figure 1 below. (06 marks)

Figure 1

## World Population Growth, 1750 – 2100



Source: United Nations World Population Prospects, 2017 Revision

- (iii) Discuss **three** factors that have been responsible for the decline in the average annual growth rate of world population since 1960s as shown in Figure 1 above. (06 marks)
- (iv) Explain **three** salient features in the growth of population in Sri Lanka since 1990s. (06 marks)

5.

- (i). Births, Deaths and migration. (02 marks)

ii). Factors responsible for the rapid population growth since Mid-1990s.

- Increased birth rate.
- Decreased death rate.
- Decline in infant mortality.
- Increase in life expectancy.
- Improvements in medical and health care services.
- Improvement in food production and agriculture.
- Urbanization.
- Improvements in Science and technology.
- Economic development.

(2 x 3 = 06 marks)

**iii). Factors responsible for the decline in average annual average growth rate of population since 1960s.**

- Decline in birth rates
- Improvements in life expectancy.
- Introduction of family planning programs.
- Improvements in education.
- Pessimistic attitudes on rapid population growth.

**(2 x 3 = 06 marks)**

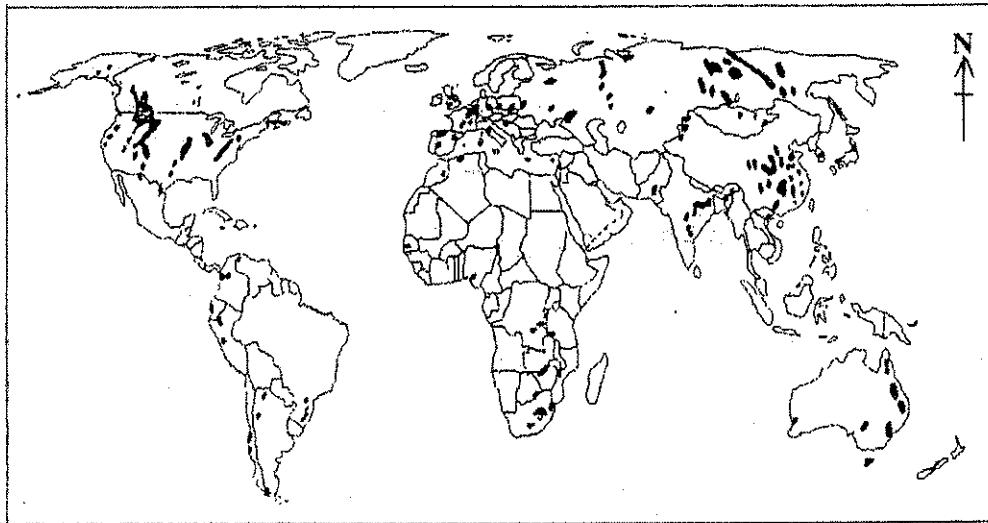
**(iv). Salient features in population growth in SL.**

- From 1871 to 2007 the population has increased from 2.5 million to 20 million.
- Few stages in rate of population growth: 1876 – 1946 slow growth; 1946 – 2000 rapid growth; after 2001 declined population growth.
- The highest growth recorded in Amapra, Mulative and Vavuniya districts.
- The lowest growth in Jaffna, Nuwara Eliya, Kegalle, Galle, Kandy, Matara, and Badulla.
- Decreasing in birth rates.
- Declining fertility rate.
- Out migration due to brain drain, ethnic conflict.

**(2 x 3 =06 marks)**

6. Figure 2 shows the distribution of coal reserves in the world.

**Figure 2**  
**Distribution of coal reserves in the world**



- (i) Identify **two** salient features in the distribution of coal fields in the world as shown in figure 2. (02 marks)
- (ii) Explain **three** characteristics in the utilization of coal as a source of energy. (06 marks)
- (iii) Examine the potentials of **three** alternative energy sources as a solution to the future energy crisis. (06 marks)
- (iv) Describe **three** issues associated with the utilization of coal as an energy source in Sri Lanka. (06 marks)

6.

**(i). Salient features in coal distribution:**

- Comparatively most of the coal fields are distributed in the Northern Hemisphere.
- In Northern Hemisphere, USA and Russia have most of the coal fields.
- In Asia most of the coal fields are in China and India.
- In the Southern Hemisphere, few coal fields are distributed in Australia, South Africa, and South America.
- There are coalfields are distributed in Western Europe.
- Most of the coalfields have regional distribution.

**(1 x 2 = 02 marks)**

**ii). Characteristics in the utilization of coal as an energy source.**

- Traditional coal was a local resource, but it has become an international market commodity.
- Coal is still maintains an important and a reliable source of energy in the World.
- At present China and India are the major coal consuming countries in the world.
- Declining coal consumption in the Western European countries.
- 20% percent of the coal production enters international trade.

- Most coal consumptions are at the hand of Asian countries such as China, Japan, Korea, India and Taiwan.
- Facing environmental threats and looking for options to use as environmental friendly energy source.
- Consumptions are affordable due to the decline in price.

(2 x 3 = 06 marks)

**(iii). Alternative energy sources:**

- Wind.
- Solar energy.
- Sea waves.
- Bio-gas.
- Nuclear energy.

(2x 3 =06 marks)

**(iv). Issues associated with the utilization of coal as an energy source in SL.**

- Problems related to environment pollution.
- Decreasing foreign asserts due to import of coal.
- Problems related to disposal of waste.
- Health problems and spread of diseases
- Damages made to natural environment. .

7. (i) What is an urban settlement? (02 marks)
- (ii) Describe **three** changing patterns of world urbanization. (06 marks)
- (iii) Explain **three** socio-economic problems emerged due to the urbanization in developing countries. (06 marks)
- (iv) Examine **three** changes that have occurred in the urbanization in the Colombo Metropolitan<sup>3</sup> Region in Sri Lanka. (06 marks)

**7.****i). What is an urban settlement?**

Urban settlements are settlements with high population density due to the concentration of a large population in a limited area of land and where various functions such as industrial financial and commercial, educational, health, administrative functions and residential facilities are concentrated. There are different types of urban settlements in terms of the size of the population, the magnitude of various functions, extent of build- up area and the level of infrastructure development. These urban settlements are called as megalopolis, metropolis, cities, and towns.

(02 marks)

**ii). Describe three changes in the world urbanization:**

- Still the highest urbanization is taking place in North America, Europe, Latin America and Caribbean countries and Oceania.
- Urbanization is increasing in the Asia –Pacific region.
- Non- stop rural migration to the major urban centers especially in developing countries.
- De-industrialization in urban areas.
- Expansion of urban land area by encroaching agricultural lands.
- Concentration of environmental friendly urban development.
- Less urbanization in African and Asian countries.
- Emerging of big cities in oil exporting middle –east countries.
- Expansion of informal activities in big cities in developing countries.

**(2 x 3 =06 marks)****(iii). Problems arising due to urbanization in developing countries:**

- Rapid increase of population due to migration and high birth rate.
- Lack of residential facilities.
- Unemployment.
- Increasing of slums and shanties.
- Problems in transportation.
- Problems in drinking water supply.
- Waste disposal problem
- Increasing income disparity.
- Social problems such as crime, looting, drug addiction etc.
- Environmental problems such as water, and air.

**(2 x 3 = 06 marks)****iv). Changes taking place in CMR:**

- Increasing in–migration.
- Heavy investments in infrastructure development
- Diminishing agricultural lands and and converting them to non-agricultural activities (industrial, commercial, residential etc.).
- Emerging satellite towns in suburbs.
- Residential expansion.
- Location of industrial zones.
- Increasing daily commuting and diurnal mobility.
- Expansion in business activities.
- Development taking place within a short period.
- Concern on recycling of waste management.
- Construction of new Colombo Port City

**(2 x 3 =06 marks)**

8. (i) Define 'Multinational Corporation'. (02 marks)
- (ii) Explain **three** benefits acquired by developing countries through the Multinational Corporations. (06 marks)
- (iii) Discuss **three** problems that have emerged due to the intervention of Multinational Corporations in developing countries. (06 marks)
- (iv) Describe **three** measures that Sri Lanka could adopt to increase the Foreign Direct Investments. (06 marks)

**i). Define what is a multinational cooperation:**

**Definition:**

A multinational corporation is a business that operates in many countries other than its home country.

(They have facilities and other assets in at least one country than its home country. Such companies have offices/ or factories in different countries and usually have a centralized head office where they coordinate global management. Very large multinationals have budgets that exceed those of small countries. Some time they are referred as transnational, international or stateless cooperation).

(02 marks)

**ii). Benefits acquired by developing countries:**

- Receive capital for the investments for industrial and services.
- Extraction of natural resources.
- Acquire advanced technology.
- Development in management skills.
- Expansion in employment opportunities.

(2 x 3 = 06 marks)

**iii). Problems due to MNC operations in developing countries:**

- Decline in local industries.
- Depletion of natural resources.
- Disappearance of small scale local traders.
- Influence of western values and the spread of new life styles.
- Effects of unnecessary advance technology especially in agricultural sector.
- New food habits.

(2 x 3 = 06 marks)

**(iv). Measures to attract FDI to SL:**

- Improve skills in digital technology of our labor force.
- Introduce new policy measures by the government to attract FDI.
- Establish political stability.
- Develop services and infrastructure facilities.
- Encourage private sector development.

(2 x 3 = 06 marks)