

**MARKING SCHEME OF OL PHYSICAL GEOGRAPHY  
NATIONAL EXAMINATION 2022-2023**

**SECTION A: Answer all questions**

- 1) **Effects of the earth's of rotation.**
  - Day and night.
  - The rising and falling of ocean tides.
  - Differences in time between longitudes
  - The deflection of winds and ocean currents.
  - Variations in atmospheric pressure over the earth's surface.
  - It influences the revolution of the moon round the earth.
  
- 2) **a) Discontinuities available in the internal structure of the earth.**
  - **Mohorovicic discontinuity/Moho discontinuity** separates crust and mantle.
  - **Gutenberg discontinuity** separates the mantle and core.**b) The main parts of the external structure of the earth.**
  - The atmosphere
  - The hydrosphere
  - The lithosphere
  - The biosphere.
  
- 3) **a) The characteristics of igneous rocks. (2marks)**
  - They are formed by the cooling of magma. (Which solidifies into or onto the earth's crust)
  - They can be either glassy or coarse.
  - They are fire formed.
  - They are dense or heavy.
  - They contain crystals after cooling.
  - They do not contain strata (layers)
  - They do not have fossils (plant and minerals remains)**b) How sedimentary rocks are formed.**
  - **Sedimentary rocks** are formed by the deposition of materials on the earth's surface and on the beds of water bodies. They are formed through the process of sedimentation.
  - **Sedimentation** is the process that causes mineral and other organic particles to settle and accumulate hence compacted to form a rock (cementation).
  - The most sedimentary rocks are those formed **in water**.
  - Sedimentary rocks are formed into three categories: mechanically, organically, chemically formed.
  
- 4) **a) Weather forecasting** is the prediction of the conditions / state of the atmosphere of a given place within a specified time period.

**b) Elements of weather:**

- Humidity
- Cloud cover
- Sunshine
- Temperature
- Precipitation
- Atmospheric pressure
- Wind

5) **Characteristics of mangrove vegetation:**

- Trees have special roots that are partly aerial.
- Roots grow horizontally above the water and then turn vertically into the muddy water.
- Some tree species grow horizontally in the mud and then bend upwards above the water as breather roots.
- At high tide the lower trunk and aerial roots are submerged.
- At low tide the trees appear to be supported on stilts of roots.
- Their roots are for anchorage and for breathing.

6) **Outlet rivers in Africa:**

- Rusizi river from Lake Kivu
- Mukungwa river from Ruhondo
- Nyabugogo river from Muhazi
- Lukga from Victoria
- Nile River
- Congo River
- Niger River
- Zambezi river
- Orange river
- Akagera river

7) a) **Heavy rainfall:** Excessive rainfall causes surface run-off. When this occurs on bare land, it causes soil erosion.

b) **Steep slopes:** They increase the speed of flow of water on the surface. This increases the rate at which erosion can occur.

c) **Winds:** Strong winds are capable of causing sheet erosion. This occurs in areas with little or no vegetation. Vegetation acts as wind breakers, lack of which promotes erosion.

8) **The factors that affect soil formation.**

a) **Nature of the Parent rock:** the underlying rock is the origin of most of the soil. It breaks down into small particles until they become small grains and practices until they become small grains and particles of sand. Hence soil formation.

b) **Climate:** it affects soil formation through seasonal variations in temperature and rainfall. The rate at which minerals and organic matter decompose. Rises with increasing temperature and rainfall.

c) **Nature of vegetation:** The decayed leaf material adds much needed humus to soil thereby increasing its fertility. The densely forested areas contain some of the best soils.

d) **Living organisms:** The main organisms that influence soil formation include plants, animals, bacteria and fungi.

Through decay and decomposition of plants organisms such as earth worms, termite's rodents assist in the mixing in organic matter (minerals) and organic matter (humus)

Animals for example contribute to the decomposition of hard rocks and complex minerals into simple substances.

e) **Topography / Relief:** Relief influence soil formation through its effects on drainage, surface run-off and erosion.

On steep slopes; the soils formed on steep slopes is generally fail to develop to maturity. This because there is high runoff rather than infiltration.

While on flat / gentle slopes, soils are more developed since the rate of erosion is matched by the rate of soil formation.

f) **Time:** Soil can be referred to as mature, immature and young soils according to the time they have taken to be formed.

9) **Characteristics of Birunga forests:**

- High animal and vegetal biodiversity
- Scanty litter (organic matter settling on the ground)
- Dark and sparse undergrowth interspersed with clearings.
- They have climbing plants
- They are evergreen
- They have three canopies
- They have tall trees.

10) a) **A Stevenson screen** is a wooden levered box that contains the instrument of weather measurement.

- It houses thermometers and the hygrometer.
- This is to protect the instruments from dew and rainfall. Rain and dew interfere with and damage the thermometers.

b) **The qualities of a Stevenson screen:**

- It is made of **wood** because wood is a bad conductor of heat.
- Stevenson screen have **louvres** to allow proper aeration.
- The Stevenson screen is **painted white**. This is purposely to reflect heat.
- Stevenson screen is placed on a grass-covered ground. This is done to prevent the radiated heat from influencing the temperatures inside the Steven screen.
- The Stevenson screen is placed on a stand, about 121 cm above the ground. This enables the air temperatures to be easily determined.
- It is located far away from obstacles such as buildings, trees or concrete fences.

11) **Differentiate between active and dormant volcanoes and give an example of each.**

- **Active volcanoes:** are volcanoes which are known to have erupted in recent time. Eg: Nyiragongo, Nyamulagira in DRC
- **Dormant volcanoes:** are volcanoes which are not known to have erupted recent time but show signs of eruption.eg: Mount Kilimanjaro in Tanzania.

12) **Characteristics of equatorial climate:**

- High mean annual temperature of about 27°C
- Diurnal mean temperature of 26°C
- Mean annual rain fall of 1500mm to 1800mm
- Diurnal range of temperature of 6°C-7°C
- High relative humidity of about 80%
- Rain fall is accompanied by thunder and lightning
- Absence of distinct dry season
- Abound rainfall of 2000mm on average

13) **The impact of pollution to human beings and their surroundings:**

- **Climate change:** high increase of rain and prolonged dry season
- **Poor health condition:** this caused by water, air, and land pollution
- **Death of aquatic life** due to the drinking of contaminated water and lack of oxygen
- **Reduction in agriculture production** because of climate change like high increase rainfall and drought
- **Formation of acidic rain** because of chemicals and smoke in the air cause the formation of acid rain.

**SECTION B: Attempt only three questions**

14) **The measures that are put in place to conserve the environment:**

- **Creating public awareness** - People are made aware of the need to conserve the environment. This is carried out through the mass media, public gatherings and seminars.
- **Participating in tree planting** - People are encouraged to plant trees. Farmers are encouraged to practice agro-forestry.
- **Introducing of environmental education** - This can include introduction of environmental clubs in schools. Through these clubs, learners are encouraged to appreciate their environment. Learners also participate in conservation of the environment.
- **Enacting laws that govern environmental conservation** – These laws help in enforcing proper use of the natural resources. The laws help in enforcing protection of endangered resources and conservation of natural resources.

- **Recycling of waste materials** – In order to keep the environment clean and healthy, waste materials such as scrap metals, papers and some types of plastics are being recycled.
- **Rehabilitating land after mining activities** – People involved in quarrying and mining activities are expected to rehabilitate such land. By doing this, piles of waste rock are flattened. Sometimes grass and trees are planted in such areas.
- **Setting up organisations and institutions to deal with matters related to environmental conservation.** United Nations Environment Programme (UNEP) is an international body which coordinates all matters related to environmental management and conservation. Some Non-governmental Organisations (NGOs) are also involved in the conservation of the environment.

15) **The measures that should be taken to minimize the spread of aridity and desertification.** Some of these measures include:

- Afforestation and re-afforestation.
- Reducing livestock numbers to avoid overgrazing.
- Improving farming methods for example encouraging crop rotation.
- Introducing alternative sources of energy to reduce the use of wood fuel.
- Educating the public on the need to conserve the environment.
- Reducing soil erosion through soil conservation measures.

16) **a) i) Lava damming** refers to the natural process where flowing lava forms a barrier/obstruction like a dam, blocking the path of a river or a stream. This occurs when a lava flow cools and solidifies, creating a barrier that can redirect the flow of water or create a lake.

ii) Two lava dammed lakes in Rwanda: Burera and Ruhondo.

**b) The reasons why do most rivers of Rwanda flow Eastwards?**

- It is because the Eastern part is on low altitude.
- Rwanda's landscape slopes towards the East.
- Rising of Congo-Nile crest.
- The volcanic eruptions in the north of western parts of Rwanda.
- Effects of river reversal
- Down warping of the eastern plain.

**c) The effects of river reversal in Rwanda:**

- Lake formation
- Most rivers of Rwanda flow Eastwards
- Development of Nile River basin
- River capture and river rejuvenation occurred.
- Alluvial lakes were formed in the eastern part of Rwanda.
- Swamps and marshland along lakes and rivers were formed.

**d) List any four African rift valley lakes:**

- Lake Kivu
- Lake albert
- Lake Tanganyika
- Lake Malawi
- Lake Turkana
- Lake Edward.

**SECTION C: ATTEMPT ANY ONE QUESTION**

**17) a) The drainage patterns shown in the map:**

- Dendritic drainage pattern
- Radial drainage pattern

**b) The highest and the lowest altitude of the area covered by the map:**

- Highest altitude: 1625 m
- Lowest altitude: 1413 m

**c) The main activities that are shown in the map and justify each activity:**

- Fishing due to the presence of rivers.
- Agriculture due to the presence of different crops grown.
- Transport and communication due to the presence of roads.
- Commerce: presence of a market.