

Geography, 2018 EC, model exam

Grade 12 · Geography · 2018 E.C.

MARKING KEY: CONFIDENTIAL

Time allowed: 120 minutes

Questions: 85

Total marks: 85

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1. Which major geological feature is directly formed through the tectonic convergence and subduction of two oceanic plates? (1)
- A. ✓ **The Mariana volcanic feature** B. The Himalayas mountain
C. The East African rift valley D. The San Andreas Fault

Answer: A

When two oceanic plates converge, the older/denser plate subducts beneath the younger, creating a deep ocean trench and a volcanic island arc (e.g., Mariana Trench and Mariana Islands). The Himalayas formed from continental-continental collision, the East African Rift from divergent plate motion, and the San Andreas Fault from transform motion.

2.	Station	Description	J	F	M	A	M	J	J	A	S	O	N	D	(1)
P		Temp (°C)	30	29	24	25	24	22	20	20	29	30	27	30	
		Rainfall (mm)	0	0	0	15	55	72	89	100	75	19	11	0	
Q		Temp (°C)	27	28	29	29	28	23	24	26	26	27	27	28	
		Rainfall (mm)	26	51	102	152	254	483	279	76	127	203	56	32	
R		Temp (°C)	-12	-10	-8	-3	8	21	24	19	5	-5	-10	-16	
		Rainfall (mm)	8	7	5	6	14	22	32	31	14	12	9	8	
S		Temp (°C)	27	27	27	27	28	28	29	28	27	27	27	27	
		Rainfall (mm)	251	188	189	195	171	173	174	103	173	206	251	269	

DIRECTION: QUESTIONS 84-88 ARE BASED ON THE DEMOGRAPHIC DATA OF A HYPOTHETICAL REGION GIVEN IN THE TABLE BELOW. THESE QUESTIONS SHOULD BE DONE ONLY BY NON-BLIND CANDIDATES.

Based on the climatic data table, what is the annual temperature range for Station "R"?

- A. ✓ **40°C** B. 35°C
C. 8°C D. 26°C

Answer: A

Annual temperature range = maximum temperature - minimum temperature. For Station R: maximum temperature = 24°C (July), minimum temperature = -16°C (December). Range = 24 - (-16) = 40°C. This large range indicates a continental climate with harsh winters.

3. What is the most accurate description of Geography as a discipline? (1)
- A. The study of human population distribution and economic activities
B. ✓ **The examination of man-environment interactions from a spatial perspective**
C. The description of Earth's physical features and their locations
D. The analysis of Earth's shape, size, and climatic conditions

Answer: B

Geography is fundamentally concerned with the spatial analysis of human-environment interactions. While options A, C, and D describe sub-aspects, option B captures the holistic, integrative core of the discipline, emphasizing the reciprocal relationship between people and their environment across space.

4. Which of the following statements is NOT a true reflection of the challenges faced by landlocked countries? (1)
- A. They lack direct territorial access to the sea for export-import trade
 - B. They are generally required to pay high transit fees to access coastal seaports
 - C. ✓ **Their commercial activities rarely face customs delays or transit interruptions**
 - D. They depend on negotiated agreements for unrestricted passage through neighboring transit states

Answer: C

Landlocked countries face significant trade challenges including lack of sea access, high transit fees, and dependence on neighboring states for passage. The statement that their commercial activities rarely face customs delays or transit interruptions is false; in reality, they frequently experience bureaucratic delays, corruption, and infrastructure bottlenecks at border crossings and ports.

5.

Demographic Variable	Value
Total population	12,000,000
Number of males	6.5 million
Number of women between 15-49 years	1/3 of the total population
Number of births	600,000
Number of deaths	120,000
Death of children under 1 year	60,000
Number of immigrants	164,000
Number of Emigrants	200,000
Total land area	120,000 km ²
Cultivated land	85% of the total land area
- DIRECTION: QUESTIONS 89-93 ARE BASED ON THE DEMOGRAPHIC DATA OF A HYPOTHETICAL REGION GIVEN IN THE TABLE BELOW. THESE QUESTIONS SHOULD BE DONE ONLY BY NON-BLIND STUDENTS.*
- Based on the demographic data table, what is the Infant Mortality Rate (IMR) of the country?
- A. 90 per 1000 live births
 - B. ✓ **100 per 1000 live births**
 - C. 10 per 1000 live births
 - D. 120 per 1000 live births

Answer: B

Infant Mortality Rate (IMR) = (Number of deaths of children under 1 year / Number of live births) × 1000. IMR = (60,000 / 600,000) × 1000 = 0.1 × 1000 = 100 per 1000 live births. This high IMR indicates poor healthcare infrastructure, high disease burden, or low access to maternal and child health services.

6. Which geological principle states that in undisturbed layers, older rocks lie beneath younger ones? (1)
- A. Original horizontality
 - B. ✓ **Superposition**
 - C. Radioactive decay
 - D. Cross-cutting relationship

Answer: B

The principle of superposition, proposed by Nicolas Steno, states that in an undisturbed sequence of sedimentary rocks, each layer is younger than the layer beneath it and older than the layer above it. This is fundamental for relative dating in geology.

7. Which African country is most globally recognized for its extensive linguistic and cultural diversity? (1)
- A. Ethiopia
 - B. Kenya
 - C. ✓ **Nigeria**
 - D. Egypt

Answer: C

Nigeria is home to over 500 living languages and more than 250 ethnic groups, including Hausa, Yoruba, Igbo, and Fulani. This makes it one of the most linguistically and culturally diverse nations globally, surpassing Ethiopia (about 90 languages), Kenya (~68), and Egypt (primarily Arabic with minority Berber).

8. What is the General Fertility Rate (GFR) of the country? (1)
- A. 50 per 1000 Women
B. ✓ 150 per 1000 Women
C. 100 per 1000 Women
D. 200 per 1000 Women

Answer: B

General Fertility Rate (GFR) = (Number of live births / Number of women aged 15–49 years) × 1000. Women 15–49 = $(1/3) \times 12,000,000 = 4,000,000$. GFR = $(600,000 / 4,000,000) \times 1000 = 0.15 \times 1000 = 150$ per 1000 women (or 150‰). This high fertility rate suggests limited family planning access, high desired family size, or early marriage patterns.

9. (1)

Station	Description	J	F	M	A	M	J	J	A	S	O	N	D
P	Temp (°C)	30	29	24	25	24	22	20	20	29	30	27	30
	Rainfall (mm)	0	0	0	15	55	72	89	100	75	19	11	0
Q	Temp (°C)	27	28	29	29	28	23	24	26	26	27	27	28
	Rainfall (mm)	26	51	102	152	254	483	279	76	127	203	56	32
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	Rainfall (mm)	8	7	5	6	14	22	32	31	14	12	9	8
S	Temp (°C)	27	27	27	27	28	28	29	28	27	27	27	27
	Rainfall (mm)	251	188	189	195	171	173	174	103	173	206	251	269

Based on the provided climatic data, which station exhibits the wettest conditions?

- A. P
B. Q
C. R
D. ✓ S

Answer: D

Calculate total annual rainfall: Station P sum = $0+0+0+15+55+72+89+100+75+19+11+0 = 436$ mm. Station Q sum = $26+51+102+152+254+483+279+76+127+203+56+32 = 1841$ mm. Station R sum = $8+7+5+6+14+22+32+31+14+12+9+8 = 168$ mm. Station S sum = $251+188+189+195+171+173+174+103+173+206+251+269 = 2343$ mm. Station S has the highest annual rainfall (2343 mm), indicating very wet conditions typical of equatorial or tropical rainforest climates.

10. Which statement correctly shows the trend of world climate change? (1)
- A. Temperature has declined in temperate regions since the 1970s
B. Precipitation has increased globally since the 1980s
C. ✓ Average global temperature has increased over the past century
D. Global climate fluctuates at the same rate

Answer: C

Multiple lines of evidence (NASA, NOAA, IPCC) confirm that average global temperature has risen approximately 1.1°C since the pre-industrial era (late 19th century) and about 0.2°C per decade since 1980. Temperatures have increased (not declined) in temperate regions. Precipitation patterns have changed regionally (not uniformly increased globally). Climate does not fluctuate at a uniform rate.

11. Which global sub-region is geographically situated between the coniferous forest belt and the polar ice caps? (1)
- A. Cold zone
B. Temperate zone
C. ✓ Tundra region
D. Frigid zone

Answer: C

The tundra region lies between the boreal coniferous forest (taiga) to the south and the polar ice caps to the north. It is characterized by permafrost, low temperatures, short growing seasons, and vegetation consisting of mosses, lichens, and dwarf shrubs, with no trees.

12. What fundamental physical characteristic distinguishes chemical weathering from physical (mechanical) weathering? (1)
- A. It relies entirely on the forceful disintegration of rocks
 - B. It results only in changes to the rock's physical texture
 - C. ✓ **It inherently involves the internal mineral dissolution and alteration of the rock**
 - D. It only changes the surface color of the rock without altering its structure

Answer: C

Chemical weathering involves the internal alteration of rock minerals through chemical reactions (dissolution, hydrolysis, oxidation, carbonation), changing the mineral composition. Physical weathering only breaks rocks into smaller pieces without changing chemical composition. Option C correctly identifies the fundamental distinction: internal mineral dissolution and alteration.

13. Which of the following is NOT a characteristic features of unplanned urbanization? (1)
- A. ✓ **Monitored land use change**
 - B. Environmental degradation
 - C. Unregulated urban growth
 - D. Urban sprawl

Answer: A

Unplanned urbanization is characterized by lack of monitoring, regulation, and control. Monitored land use change requires planning and oversight, which is absent in unplanned urbanization. Environmental degradation, unregulated growth, and urban sprawl are typical negative consequences.

14. Which of the following station exhibits the highest annual range of temperature? (1)
- A. S
 - B. ✓ **R**
 - C. Q
 - D. P

Answer: B

Annual temperature ranges: Station P: max 30°C, min 20°C, range = 10°C. Station Q: max 29°C, min 23°C, range = 6°C. Station R: max 24°C, min -16°C, range = 40°C. Station S: max 29°C, min 27°C, range = 2°C. Station R has the highest range (40°C) due to its continental location with very cold winters and warm summers.

15. What is the Sex Ratio (males per 100 females) of the country based on the demographic data? (1)
- A. 84.6%
 - B. ✓ **118.2%**
 - C. 100%
 - D. 130%

Answer: B

Sex Ratio = (Number of males / Number of females) × 100. Total population = 12,000,000; males = 6,500,000; females = 12,000,000 - 6,500,000 = 5,500,000. Sex Ratio = (6,500,000 / 5,500,000) × 100 = 1.1818 × 100 = 118.2 (or 118.2 males per 100 females). This male surplus may indicate female-selective migration, higher female mortality, or sex-selective birth patterns.

16. What is the crude population density (arithmetic density) of the country? (1)
- A. 87 persons per km²
 - B. ✓ **100 persons per km²**
 - C. 112 persons per km²
 - D. 120 persons per km²

Answer: B

Crude (Arithmetic) Population Density = Total population / Total land area = 12,000,000 / 120,000 km² = 100 persons per km². This represents the average number of people per square kilometer, without considering variations in land suitability, urbanization, or agricultural capacity.

17. Based on the climatic data, which ecosystem is most likely represented by Station "S"? (1)

- A.** Tropical desert areas
- B.** Tundra region
- C.** Mediterranean region
- D. ✓ Equatorial rainforest region**

Answer: D

Station S has consistently high temperatures year-round (27-29°C, very low annual range of 2°C) and very high annual rainfall (2343 mm) with no dry season (all months >100 mm except August at 103 mm). This indicates an equatorial rainforest climate (Köppen Af) with high humidity, consistent insolation, and abundant biodiversity typical of the Amazon, Congo Basin, or Southeast Asia.

18. Based on geological theories of Earth's history, how were the continents formed? (1)

- B. ✓ Through tectonic material collision and continental drift**

Answer: B

Continents formed through plate tectonics: the movement of Earth's lithospheric plates, collisions, subduction, and continental drift over hundreds of millions of years. This process, explained by Wegener's continental drift theory and later plate tectonics, assembled and broke apart supercontinents like Pangea.

19.	Station	Description	J	F	M	A	M	J	J	A	S	O	N	D	(1)
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- A. ✓ 40°C B. 35°C
C. 8°C D. 26°C

Answer: A

Annual temperature range = maximum temperature - minimum temperature. For Station R: maximum temperature = 24°C (July), minimum temperature = -16°C (December). Range = 24 - (-16) = 40°C. This large range indicates a continental climate with harsh winters.

20. What key implication can be drawn from the given demographic data? (1)

- A. The majority of the population lives in the urban area
- B. The country receives more immigrants than emigrants
- C. The number of females exceeds the number of males
- D. ✓ **The majority of the population depends upon agricultural activity**

Answer: D

Cultivated land = 85% of total land area, indicating that most land is used for agriculture, suggesting an agrarian economy. Net migration = 164,000 - 200,000 = -36,000 (more emigrants than immigrants). Males (6.5M) exceed females (5.5M). No data on urban population is provided. The high agricultural land proportion supports that the majority depends on farming.

21. Based on the provided climatic data, which station exhibits the wettest conditions? (1)

- A. P
B. Q
C. R
D. ✓ S

Answer: D

Calculate total annual rainfall: Station P sum = $0+0+0+15+55+72+89+100+75+19+11+0 = 436$ mm. Station Q sum = $26+51+102+152+254+483+279+76+127+203+56+32 = 1841$ mm. Station R sum = $8+7+5+6+14+22+32+31+14+12+9+8 = 168$ mm. Station S sum = $251+188+189+195+171+173+174+103+173+206+251+269 = 2343$ mm. Station S has the highest annual rainfall (2343 mm), indicating very wet conditions typical of equatorial or tropical rainforest climates.

22. Assuming Station "P" is located north of the equator, when does it most likely receive maximum rainfall? (1)

- A. December, January, February
B. ✓ June, July, August
C. September, October, November
D. March, April, May

Answer: B

Station P shows maximum rainfall in June (72 mm), July (89 mm), and August (100 mm) — the JJA (June-July-August) months. As Station P is north of the equator, summer occurs in June-August, when the ITCZ migrates northward, bringing convective rainfall. The rainfall pattern (dry winter, wet summer) suggests a tropical savanna climate (Köppen Aw) with summer maximum. Option B (June, July, August) correctly identifies the peak rainfall period.

23. Which sub-field of human geography specifically investigates how places change and evolve over time? (1)

- A. Urban geography
B. ✓ Historical geography
C. Cultural geography
D. Political geography

Answer: B

Historical geography studies the geographies of the past and how places, landscapes, and regions change over time. It reconstructs past spatial patterns and processes to understand contemporary human-environment relationships. Urban, cultural, and political geography focus on specific thematic aspects.

24. According to the Corruption Perceptions Index, which of the following African countries is consistently ranked as the least corrupt? (1)

- A. Republic of South Africa
B. Ethiopia
C. ✓ Botswana
D. Nigeria

Answer: C

Botswana consistently ranks as the least corrupt country in Africa according to Transparency International's Corruption Perceptions Index (CPI), often scoring above 60/100. It is frequently ranked alongside European countries due to strong governance, rule of law, and anti-corruption institutions since independence in 1966.

25. Why is oceanic crust forced to subduct beneath continental crust at convergent plate boundaries? (1)

- A. It is thicker
B. It is less dense
C. ✓ It is denser
D. It is older

Answer: C

Oceanic crust (basalt, density ~ 3.0 g/cm³) is denser than continental crust (granite, density ~ 2.7 g/cm³). At convergent boundaries, the denser oceanic plate sinks (subducts) beneath the less dense continental plate due to gravitational forces, creating deep ocean trenches and volcanic arcs.

26. Which of the following was NOT used by Alfred Wegener as primary evidence to support his theory of continental drift? (1)

- A. ✓ **Paleomagnetic data from ocean floors** B. Coastline similarity (Jig-Saw-Fit)
C. Fossil distribution across continents D. Rock type and structural similarities

Answer: A

Wegener (1912) used coastline fit, fossil evidence (Mesosaurus, Glossopteris), glacial deposits, and matching rock sequences across continents. Paleomagnetic data from ocean floors became available later (1950s-60s) and provided key evidence for seafloor spreading and plate tectonics, not Wegener's original work.

27. How can the most significant long-term impact of climate change on African agriculture be best evaluated? (1)

- A. As a driver for improved crop yields in previously desertified regions
B. ✓ **As a catalyst for increased pest and disease outbreaks affecting both crops and livestock**
C. As a stabilizing force for regional water resources utilized in commercial irrigation
D. As a primary reason for the increased biodiversity of native plants and animals

Answer: B

Climate change is projected to increase pest and disease outbreaks (e.g., desert locusts, fall armyworm, trypanosomiasis) due to warmer temperatures, altered rainfall patterns, and increased humidity. This threatens food security and livestock productivity across Africa, far outweighing any localized benefits.

28. A researcher studying the specific reasons why temperatures decrease from lowland to highland areas is engaging in which research purpose? (1)

- A. Exploration B. Description
C. ✓ **Explanation** D. Prediction

Answer: C

Explanation seeks to answer 'why' questions by identifying causal relationships. Here, the researcher goes beyond describing the pattern (temperature decreases with altitude) to explain the underlying causes: adiabatic cooling (expansion of rising air reduces temperature by approximately 6.5°C per 1000 m increase), reduced atmospheric pressure, and thinner greenhouse effect.

29. What type of rainfall is common in humid areas with high temperatures throughout the year? (1)

- A. Relief rainfall B. Cyclonic rainfall
C. ✓ **Convictional rainfall** D. Frontal rainfall

Answer: C

Convictional rainfall occurs when intense solar heating in humid, hot regions causes rapid evaporation and rising warm, moist air. As air rises, it cools adiabatically, condenses, and forms afternoon thunderstorms. This is common in equatorial rainforests and tropical regions like the Amazon, Congo Basin, and Indonesia.

30. Which of the following groups of countries are among Ethiopia's top export destinations? (1)

- A. ✓ **Somalia, Djibouti and Kenya** B. South Africa, Egypt, and Uganda
C. Morocco, South Africa, and Egypt D. South Africa, Egypt, and Uganda

Answer: A

Ethiopia's top export destinations include neighboring countries: Somalia, Djibouti (primary port access), Kenya, as well as Sudan, and international partners like China, Netherlands, and Germany. Regional African trade is heavily concentrated in East Africa and the Horn due to proximity and established trade routes.

31. Which chronological arrangement correctly matches a geological time scale period with its corresponding major event? (1)
- A. Precambrian Era – Formation of rift valleys
 - B. Paleozoic Era – Formation of sedimentary rocks
 - C. Mesozoic Era – Formation of denudation and peneplanation
 - D. ✓ **Cenozoic Era – Formation of Earth's present-day shape**

Answer: D

The Cenozoic Era (66 million years ago to present) saw the final breakup of Pangea, continued plate collisions (Himalayas, Alps), extensive volcanism, and erosion that shaped modern continents, ocean basins, and mountain ranges. The present-day configuration of landmasses largely emerged during this era.

32. What geographic term describes a narrow strip of land, bordered by water on both sides, that connects two larger landmasses? (1)
- A. ✓ **Isthmus**
 - B. Peninsula
 - C. Continent
 - D. Island

Answer: A

An isthmus is a narrow land bridge connecting two larger landmasses, with water on both sides. Examples include the Isthmus of Panama (connecting North and South America) and the Isthmus of Suez (connecting Africa and Asia). A peninsula is land surrounded by water on three sides, a continent is a large landmass, and an island is land completely surrounded by water.

33. What indicates the absolute location of Ethiopia in terms of its North-South extent? (1)
- A. 33°E – 48°E
 - B. ✓ **3°N – 15°N**
 - C. 3°N – 48°N
 - D. 15°N – 33°N

Answer: B

Ethiopia's north-south extent (latitudinal range) is approximately from 3° *N* to 15° *N*. The easternmost point is near 48° *E* (longitude, east-west extent). Option B correctly gives the latitudinal range, while options mixing latitude with longitude or incorrect ranges are wrong.

34. What is the primary foundational objective of the Nile Basin Initiative (NBI)? (1)
- A. ✓ **To bring sustainable socio-economic development through equitable utilization to Basin States**
 - B. To actively work toward water scarcity mitigation strictly in the Lower Nile Basin
 - C. To discourage bilateral cooperation in favor of a unified single-state mandate
 - D. To exclusively promote research on climate change impacts within the Nile Basin

Answer: A

The Nile Basin Initiative (NBI), established in 1999 by 10 Nile Basin countries, aims to achieve sustainable socio-economic development through equitable and cooperative utilization of Nile water resources. It promotes shared benefits, regional integration, and poverty alleviation, not unilateral control or limited geographic focus.

35. Which of the following is NOT considered a major problem facing the utilization of African water resources? (1)
- A. High seasonal fluctuation of river volumes
 - B. Excess and unmanageable water flow in some rivers
 - C. Severe climate variations and changes
 - D. ✓ **The reduction of water loss during irrigation practices**

Answer: D

Reducing water loss during irrigation is a solution, not a problem. Major problems in Africa include seasonal fluctuations (floods/droughts), excessive flows causing erosion, climate variability, inadequate infrastructure, and high evaporation losses. Options A, B, and C are genuine challenges.

36. Which country currently stands as the leading exporter of agricultural products within intra-African trade? (1)
- A. Ethiopia
 - B. Uganda
 - C. Egypt
 - D. ✓ **South Africa**

Answer: D

South Africa is the leading exporter of agricultural products in intra-African trade, exporting maize, wine, citrus fruits, and other processed goods to neighboring countries (Botswana, Namibia, Zimbabwe, Mozambique) and beyond, due to its advanced agricultural sector and infrastructure.

37. Which climatic factor most strongly influences the distinct climate patterns of warm temperate east coast regions? (1)
- A. Distance from the sea
 - B. ✓ **Ocean current**
 - C. Latitude
 - D. Altitude

Answer: B

Warm ocean currents (e.g., Gulf Stream, Brazil Current, East Australian Current, Kuroshio) bring warm, moist air to east coast subtropical regions, creating humid subtropical climates (Köppen Cfa) with hot, humid summers and mild winters. These currents significantly moderate temperatures and increase precipitation compared to west coasts at similar latitudes.

38. During the Northern Hemisphere summer, in which direction do pressure belts move from their average position? (1)
- A. Westwards
 - B. Eastwards
 - C. Southwards
 - D. ✓ **Northwards**

Answer: D

Pressure belts shift northward during Northern Hemisphere summer due to the Sun's vertical rays migrating to the Tropic of Cancer ($23.5^{\circ}N$). The ITCZ (Intertropical Convergence Zone), subtropical highs, and subpolar lows all follow this seasonal migration, causing shifts in wind patterns and rainfall regimes.

39. What is a possible negative impact of agricultural intensification? (1)
- A. Increased biodiversity conservation
 - B. Maintenance of soil fertility
 - C. ✓ **Growth of pesticide hazards**
 - D. Reduced greenhouse gas emission

Answer: C

Agricultural intensification increases pesticide and fertilizer use, leading to pesticide hazards: water contamination, harm to non-target species (bees, beneficial insects), pesticide resistance in pests, and human health risks. Biodiversity conservation is reduced, soil fertility often declines, and greenhouse gas emissions (N_2O from fertilizers, CO_2 from machinery) increase.

40. What demographic conditions characterize the first stage of the Demographic Transition Model? (1)
- A. High birth rates and low death rates B. Low birth rates and high death rates
C. ✓ **High birth rates and high death rates** D. Stable birth and death rates

Answer: C

Stage 1 (Pre-Industrial) is characterized by high birth rates (to offset high infant mortality) and high death rates (due to disease, famine, poor sanitation, lack of medical care). Population growth is slow or stable, with low life expectancy. No country remains in Stage 1 today.

41. Which of the following is identified as a major anthropogenic source of carbon monoxide (CO) pollution? (1)
- A. Industrial processes B. ✓ **Vehicular exhaust**
C. Natural gas leaks D. Forest fires

Answer: B

Vehicular exhaust from internal combustion engines (especially gasoline vehicles) is the largest anthropogenic source of CO, produced by incomplete combustion of fuel. Industrial processes, natural gas leaks (mostly methane), and forest fires (natural or anthropogenic) contribute less CO overall.

42. What marginal map information indicates the relationship between distance on the map and actual ground distance? (1)
- A. Key B. ✓ **Scale**
C. Title D. Grid reference

Answer: B

Scale is the ratio of map distance to ground distance (e.g., 1:100,000 means 1 cm on map = 1 km on ground). Key explains symbols, title names the map, and grid reference provides coordinate location. Scale is essential for measuring real-world distances and areas.

43. Which major African river basin experiences exceptionally high water evaporation rates primarily due to its geographic location in extreme high-temperature zones? (1)
- A. Congo Basin B. ✓ **Chad Basin**
C. Niger Basin D. Nile Basin

Answer: B

The Lake Chad Basin (Chad Basin) experiences extremely high evaporation rates due to intense solar radiation and high temperatures (averaging 25–35°C) in the Sahel and Sahara regions. Lake Chad has lost over 90% of its surface area since the 1960s due to a combination of evaporation, climate change, and water diversion for irrigation.

44. According to the Köppen climate classification system, which pair of climatic types is LEAST capable of supporting abundant plant communities? (1)
- A. ✓ **Climate B and Climate E** B. Climate C and Climate H
C. Climate A and Climate D D. Climate A and Climate C

Answer: A

Köppen Climate B (dry/arid) includes deserts and steppes with very low precipitation, limiting vegetation. Climate E (polar) has extremely cold temperatures, permafrost, and short growing seasons, supporting only mosses, lichens, or no vegetation. A (tropical), C (temperate mild), D (continental cold) support abundant forests and grasslands.

45. Which distinct climatic region is uniquely located at both the extreme northern and extreme southern tips of the African continent? (1)
- A. Tropical maritime climate
 - B. Tropical continental climate
 - C. ✓ **Mediterranean climate**
 - D. Equatorial climate

Answer: C

Mediterranean climate (Köppen Csa/Csb) is found at the extreme northern tip (Morocco, Algeria, Tunisia, Libya, Egypt's coast) and extreme southern tip (South Africa's Western Cape around Cape Town). It features hot, dry summers and mild, wet winters due to subtropical high pressure in summer and mid-latitude cyclones in winter.

46. Which form of corruption occurs when community funds are illegally diverted from their intended public use into individuals' private pockets? (1)
- A. ✓ **Theft of public assets**
 - B. Nepotism
 - C. Kick-backs
 - D. Bribery

Answer: A

Theft of public assets (embezzlement) involves illegally diverting public funds for private gain. Nepotism is favoritism to relatives, kick-backs are secret payments for inflated contracts, and bribery is offering money to influence decisions. Only theft directly describes stealing community funds.

47. What best describes the difference between economic growth and economic development? (1)
- A. Economic growth indicates structural and technological change
 - B. ✓ **Economic growth measures the quantity of goods and services produced**
 - C. Economic development is one aspect of economic growth
 - D. Economic growth measures societal welfare

Answer: B

Economic growth is a narrow measure of increased output (GDP/GNP), focusing on quantity of goods and services. Economic development is broader, encompassing improvements in living standards, health, education, income distribution, poverty reduction, and structural transformation. Growth can occur without development (e.g., wealth concentrated in elite).

48. What was the primary criteria used by ancient Greeks to formulate their early global climate classification system? (1)
- A. Distribution of rainfall
 - B. Wind speed and direction
 - C. Data accumulation on climate
 - D. ✓ **The Earth-Sun relationship**

Answer: D

Ancient Greeks (e.g., Aristotle, Parmenides) divided Earth into torrid (hot), temperate, and frigid (cold) zones based on the Sun's angle and latitude. They understood that regions near the equator received more direct sunlight, while polar regions received oblique rays, making Earth-Sun geometry the primary criterion.

49. Which statement accurately describes a characteristic of a small-scale map? (1)
- A. ✓ **It displays limited detailed information over extensive areas**
 - B. It depicts large areas with highly detailed information
 - C. It shows small areas with minimal detail
 - D. It represents features at or near their actual size

Answer: A

Small-scale maps have a small representative fraction (e.g., 1:1,000,000) meaning 1 unit on map = 1,000,000 units on ground. They cover large areas (continents, countries) with limited detail, showing only major features like cities, rivers, and boundaries. Large-scale maps (1:10,000) show small areas with high detail.

50. In Milankovitch's orbital theory, what specific term describes the periodic change in the circular to elongated shape of Earth's orbit? (1)
- A. Tilt of earth's axis
 - B. Obliquity
 - C. ✓ **Eccentricity**
 - D. Precession

Answer: C

Eccentricity refers to changes in Earth's orbital shape from nearly circular to more elliptical over cycles of approximately 100,000 and 413,000 years. Obliquity is the tilt change (axial tilt, 41,000-year cycle), and precession is the wobble of Earth's axis (26,000-year cycle). These cycles drive ice age cycles.

51. Which concept best describes the phenomenon where shared environmental resources are overexploited due to unrestricted individual access? (1)
- A. Resource privatization
 - B. Equitable resource sharing
 - C. ✓ **Tragedy of the commons**
 - D. Sustainable land use

Answer: C

The 'Tragedy of the Commons,' coined by Garrett Hardin (1968), describes how individuals acting independently and rationally in their self-interest deplete a shared resource (e.g., grazing land, fisheries, clean air) even when it is clear that overexploitation harms everyone in the long term.

52. What types of population pyramid is a triangular shape with wide a base and narrow top? (1)
- A. Contractive pyramid
 - B. Stationary pyramid
 - C. ✓ **Expansive pyramid**
 - D. Symmetry pyramid

Answer: C

An expansive pyramid (rapid growth) has a wide base (high birth rates, many young people) and narrow top (few elderly, high death rates). This shape is typical of developing countries with high fertility and lower life expectancy, e.g., many sub-Saharan African nations.

53. When analyzing resource degradation, which of the following is categorized as a direct 'proximate cause' rather than an underlying structural cause? (1)
- A. Rapid population growth
 - B. ✓ **Deforestation for agriculture**
 - C. Improper land use practices
 - D. Climate change

Answer: B

Proximate causes are direct, immediate human actions causing degradation (e.g., deforestation, overgrazing, mining, infrastructure expansion). Underlying causes are root drivers (population growth, poverty, market failures, policies, technology, climate change). Deforestation for agriculture is a direct action; population growth and climate change are structural drivers.

54. Which of the following statements regarding Earth's tectonic plates is INCORRECT? (1)
- A. Plates can be composed entirely of continental crust
 - B. Plates can be composed entirely of oceanic crust
 - C. Plates frequently contain both continental and oceanic crust
 - D. ✓ **Plates are fixed in place and do not experience lateral movement**

Answer: D

Tectonic plates are not fixed; they move laterally at rates of 1-15 cm/year due to mantle convection, slab pull, and ridge push. Plates can be entirely continental (e.g., some microplates), entirely oceanic (e.g., Pacific Plate), or mixed (e.g., South American Plate containing both Andes and Atlantic seafloor).

55. Which of the following is NOT one of the domains of Geographic information system (GIS)? (1)

- A. Data manipulation
- B. ✓ **Data discussion**
- C. Data storage and management
- D. Data analysis and presentation

Answer: B

Core GIS domains include data input, data storage and management, data manipulation (transformation, geoprocessing), data analysis (spatial queries, overlay, buffers), and data visualization/presentation (maps). 'Data discussion' is not a technical GIS function; it refers to collaborative interpretation, not a formal GIS domain.

56. In which major African landform are the majority of the continent's famous national wildlife parks located? (1)

- A. Sahel region
- B. Sahara Desert
- C. Tropical rain forest region
- D. ✓ **Savanna region**

Answer: D

Most famous African wildlife parks (Serengeti, Maasai Mara, Kruger, Ngorongoro, Okavango) are in savanna regions, characterized by grasslands with scattered trees, abundant herbivores (zebra, wildebeest, elephant, giraffe), and predators (lion, leopard, hyena). The open vegetation allows wildlife viewing.

57. What type of solutions do 'Bright Greens' environmentalism advocate for environmental challenges? (1)

- A. Radical political and economic changes
- B. Strict preservation of natural resources
- C. ✓ **Technological solutions and innovation**
- D. Individual lifestyle choices

Answer: C

Bright Greens emphasize technological optimism and eco-innovation as solutions to environmental problems, including renewable energy, green chemistry, carbon capture, electric vehicles, and smart grids. They contrast with Deep Greens (radical system change) and Light Greens (individual lifestyle changes).

58. Which statistical diagram is most suitable for visually comparing monthly rainfall amounts across different regions? (1)

- A. Pie chart
- B. Line graph
- C. ✓ **Bar graph**
- D. Base map

Answer: C

Bar graphs (or clustered bar graphs) are ideal for comparing discrete monthly rainfall values across regions because bars clearly show differences in magnitude. Line graphs show trends over time, pie charts show proportions of a whole, and base maps show spatial distribution.

59. Which of the following is a characteristic of the coniferous forest region? (1)

- A. It has fertile soil that supports rain-fed agriculture
- B. It is dominated by varied vegetation types
- C. ✓ **It is found only in the northern hemisphere**
- D. It experiences invariable temperature conditions

Answer: C

Coniferous forests (taiga/boreal forests) are found only in the Northern Hemisphere, spanning Russia, Canada, Scandinavia, and Alaska. They have cold winters, short summers, low temperatures, and poor acidic soils (podzols) unsuitable for agriculture. Vegetation is dominated by conifers (spruce, fir, pine, larch), not varied species.

60. Which of the following statements is NOT true regarding the equatorial rainforest climate? (1)
- A. It exhibits high mean monthly and mean annual temperatures
 - B. ✓ **It experiences a consistently low sun angle throughout the year**
 - C. It features a high daily temperature range but a low annual temperature range
 - D. It receives substantial rainfall consistently throughout the year

Answer: B

Equatorial regions experience a consistently HIGH sun angle (near zenith) year-round because they are near the equator (0° latitude), not low sun angle. Low sun angles occur at higher latitudes (polar regions). Statement B is false; A, C, and D are true characteristics.

61. If you were commissioned to conduct an empirical study, which basic element of research might enable you to identify gaps to be filled by your study? (1)
- A. Defining sampling design
 - B. Delineating the scope of study
 - C. ✓ **Reviewing related literature**
 - D. Developing a hypothesis

Answer: C

Reviewing related literature (literature review) identifies research gaps by critically analyzing existing studies, theories, methodologies, and findings. It reveals what is known, what is contested, and what remains unexplored, allowing researchers to justify their study's contribution and formulate research questions.

62. If the land between two parallel faults sinks down while the surrounding areas remain elevated, what landform is formed? (1)
- A. Horst
 - B. ✓ **Rift valley**
 - C. Escarpment
 - D. Plateau

Answer: B

A rift valley (or graben) forms when the block of land between two parallel normal faults subsides due to extensional forces, while the surrounding blocks (horsts) remain elevated or are uplifted. The East African Rift Valley is a prominent example, with the valley floor dropping and adjacent highlands rising.

63. What soil conservation method involves covering the soil with plant residues to conserve moisture and restore fertility? (1)
- A. Crop rotation
 - B. Green manure
 - C. ✓ **Mulching**
 - D. Fallowing

Answer: C

Mulching involves covering soil with organic materials (straw, leaves, grass clippings) or synthetic films. It reduces evaporation, suppresses weeds, moderates soil temperature, prevents erosion, and adds organic matter as mulch decomposes. Crop rotation alternates crops, green manure incorporates fresh plants, fallowing leaves land idle.

64. Which of the following is the main goal of the environmental policies of Ethiopia? (1)
- A. Minimizing the use of natural resources
 - B. ✓ **Protecting natural resources from wastage**
 - C. Prohibiting people from using natural resources
 - D. Ending exploitation of natural resources

Answer: B

Ethiopia's environmental policies (e.g., Climate-Resilient Green Economy Strategy, Environmental Policy of Ethiopia 1997) focus on sustainable resource management, preventing wastage, reforestation, soil conservation, and reducing degradation. The goal is protection from wastage and overexploitation, not prohibition or cessation of resource use, which is necessary for development.

65. The behavioral approach to explaining poverty is typically favored by individuals who describe themselves as: (1)
- A. Liberal
 - B. ✓ **Conservative or libertarian**
 - C. Socialist
 - D. Communist

Answer: B

Conservatives and libertarians emphasize individual responsibility, choices, and behaviors (e.g., work ethic, education, family structure) as causes of poverty. Liberals and socialists focus on structural factors (inequality, discrimination, lack of opportunity, systemic barriers).

66. According to Karl Marx's critique, how does the capitalist system fundamentally generate a 'surplus population'? (1)
- A. By actively encouraging rapid, unchecked population growth
 - B. By creating market systems that provide ample, stable job opportunities
 - C. ✓ **By systematically separating producers from their independent means of production**
 - D. By enforcing the equal distribution of environmental resources among all classes

Answer: C

Marx argued capitalism creates a 'reserve army of labor' (surplus population) by dispossessing workers from means of production (land, tools) through enclosure movements and privatization. This forces workers to sell labor for wages, and capitalists maintain unemployment to suppress wages and discipline workers. This is distinct from Malthusian population theory.

67. The specific techniques, tools, and procedures used by a researcher to gather and analyze data are collectively termed as: (1)
- A. Research approach
 - B. Research methodology
 - C. Research project
 - D. ✓ **Research methods**

Answer: D

Research methods refer to specific techniques (surveys, interviews, experiments, statistical analysis, GIS, remote sensing). Research methodology is the broader strategy and philosophy guiding the research. Research approach includes paradigms (qualitative/quantitative), and research project is the overall undertaking.

68. Which African soil type is strongly weathered with low nutrient-holding capacity and associated with high rainfall areas and old land surfaces? (1)
- A. ✓ **Ferralsols**
 - B. Cambisols
 - C. Leptosols
 - D. Arenosols

Answer: A

Ferralsols (Oxisols in USDA taxonomy) are highly weathered, deep, red/yellow soils rich in iron and aluminum oxides, with low nutrient-holding capacity (low CEC) and low fertility. They form in tropical regions (Congo Basin, Amazon) with high rainfall and old, stable landscapes. Cambisols are young soils, Leptosols are shallow, Arenosols are sandy.

69. Which traditional belief system serves as an indigenous mechanism helping the Gumuz people of Ethiopia manage their environment as communal property? (1)
- A. ✓ **Yamba**
 - B. Paleta
 - C. Maccaa
 - D. Guma

Answer: A

Yamba is a traditional belief and governance system among the Gumuz people of Ethiopia (Benishangul-Gumuz region) that regulates communal resource use, including sacred groves, water sources, and forests. It enforces taboos, protects biodiversity, and ensures sustainable harvesting. Paleta is Oromo conflict resolution, Maccaa is an Oromo clan, Guma is compensation for homicide.

70. According to energy consumption projections, which pair of countries is expected to contribute the most to the increase in residential energy use among non-OECD nations by 2030? (1)
- A. USA and Germany
B. ✓ **China and India**
C. Japan and South Korea
D. England and France

Answer: B

China and India are the largest non-OECD nations with rapidly growing populations, urbanization, rising middle classes, and increasing appliance ownership. IEA and EIA projections indicate they will account for the largest share of residential energy consumption growth by 2030, primarily for cooling, heating, and electronics.

71. What essential characteristic of a census ensures every individual is counted exactly once without omission or duplication? (1)
- A. ✓ **Universality**
B. Expensiveness
C. Periodicity
D. Defined territory

Answer: A

Universality (or completeness) means the census covers every individual in the target population exactly once, with no omissions or double-counting. Expensiveness is a challenge, periodicity refers to regular intervals (e.g., every 10 years), and defined territory specifies geographic coverage.

72. Which of the following government actions serves as an example of a direct intervention of a population policy? (1)
- A. Providing old age security
B. Restricting child labor
C. Provision of basic education
D. ✓ **Rising the age of marriage**

Answer: D

Direct population policies explicitly target demographic variables (fertility, mortality, migration). Raising the legal age of marriage directly reduces fertility by delaying childbearing and shortening reproductive windows. Social security, child labor laws, and education are indirect or general welfare policies.

73. What was the main objective of the 1994 International Conference on Population and Development held in Cairo? (1)
- A. To promote economic development in developing countries
B. ✓ **To link population growth to core development agendas**
C. To implement a one-child policy worldwide
D. To encourage migration to control population growth

Answer: B

The 1994 ICPD shifted focus from population control to linking population dynamics with development, gender equality, reproductive health, and women's empowerment. It adopted a 20-year Programme of Action emphasizing that population policies must be integrated with poverty reduction, education, and health, not imposed through coercion.

74. Which of the following can be considered an objective of economic development? (1)
- A. Limiting availability of basic needs
B. Accumulating maximum capital wealth
C. ✓ **Expanding economic and social choices**
D. Abstaining from using natural resources

Answer: C

Economic development aims to expand human capabilities and choices: access to education, healthcare, clean water, employment, political freedom, and cultural participation (Sen's Capability Approach). It is not about maximizing wealth, restricting resources, or limiting needs, but improving quality of life and reducing poverty.

75. Which statement provides the BEST critical evaluation of the relationship between global warming and climate change? (1)
- A. They are identical phenomena used interchangeably in scientific literature
 - B. ✓ **Global warming is a major, specific aspect driving the broader phenomenon of climate change**
 - C. Climate change is the sole direct cause of localized global warming
 - D. They are scientifically unrelated phenomena occurring simultaneously

Answer: B

Global warming refers specifically to the long-term increase in Earth's average surface temperature due to greenhouse gas emissions. Climate change encompasses broader changes: temperature shifts (warming/cooling), altered precipitation patterns, sea-level rise, extreme weather events, and ecosystem changes. Global warming is the primary driver of contemporary climate change.

76. How does the 'nested rings' approach critically assess the pillars of sustainable development? (1)
- A. It insists the economy operates completely independently of society & the environment
 - B. ✓ **It insists the economy is fundamentally dependent on society, which is entirely dependent on the environment**
 - C. It insists the natural environment is entirely dependent on economic output
 - D. It insists all three pillars exist as completely separate, non-overlapping domains

Answer: B

The nested rings (or concentric circles) model shows the economy is a subset of society (dependent on human institutions, labor, culture), and society is a subset of the environment (dependent on natural resources, ecosystem services, life support). This hierarchy recognizes that environmental sustainability is foundational; economy and society cannot function without a healthy environment.

77. Which of the following is considered a severe, direct demographic impact of the HIV/AIDS epidemic in heavily affected regions? (1)
- A. Widespread orphanhood
 - B. General psychological stress
 - C. Increased economic dependency ratios
 - D. ✓ **Drastically shortened average life expectancies**

Answer: D

HIV/AIDS directly reduces life expectancy by decades in heavily affected countries (e.g., Botswana, South Africa, Zimbabwe where life expectancy fell from ~65 to ~40 years in the 1990s-2000s before treatment access improved). This is a direct demographic impact. Orphanhood, psychological stress, and economic dependency are secondary socio-economic consequences.

78. Which one of the following is the most and least urbanized regions of Africa respectively? (1)
- A. North Africa and West Africa
 - B. Central Africa and West Africa
 - C. Central Africa and South Africa
 - D. ✓ **South Africa and East Africa**

Answer: D

Southern Africa (led by South Africa at ~68% urban) is the most urbanized region, followed by North Africa (~55%). East Africa (e.g., Ethiopia, Kenya, Tanzania, Uganda) is the least urbanized region (~25-30%) despite rapid growth. West and Central Africa have intermediate urbanization levels (~45-50%).

79. An extended shortfall of precipitation over an area is initially and primarily classified as what specific type of drought? (1)
- A. Hydrological drought
B. ✓ **Meteorological drought**
C. Agricultural drought
D. Environmental drought

Answer: B

Meteorological drought is defined solely by precipitation deficit over a period (weeks, months, years), measured by rainfall departure from normal. It is the primary/initial drought type. Hydrological drought follows when streamflow, reservoir, and groundwater levels decline. Agricultural drought occurs when soil moisture is insufficient for crops.

80. How is the geographic and climatological term 'albedo' best defined? (1)
- A. The amount of energy absorbed by the surface
B. The amount of energy stored in water
C. ✓ **The amount of energy reflected by the surface**
D. The amount of energy stored in the surface

Answer: C

Albedo (from Latin 'albus' = white) is the fraction of solar radiation reflected by a surface, expressed as a percentage (0-100%). High albedo surfaces (snow, ice, clouds, deserts) reflect most incoming radiation; low albedo surfaces (oceans, forests, asphalt) absorb more, contributing to warming. Albedo feedback amplifies climate change.

81. Why do you think that the mountain sides opposite the wind direction remain as rain shadow areas? (1)
- A. They receive high moisture instead of rainfall
B. They are influenced by moist winds
C. ✓ **They are influenced by less moist winds**
D. They are influenced by strong winds

Answer: C

Rain shadow (leeward) areas receive dry winds because air descending the mountain warms adiabatically (adiabatic heating) and dries out (relative humidity drops). Most moisture is lost as precipitation on the windward side. Leeward winds are 'less moist' (dry) due to orographic lifting effect, creating arid conditions (e.g., Atacama Desert, Death Valley).

82. If you conduct geographic research, in which part of the research would you discuss the statistical techniques to be employed to process their findings? (1)
- A. Research design
B. ✓ **Data Analysis**
C. Data collection and organization
D. Research Hypothesis

Answer: B

Statistical techniques (descriptive statistics, inferential tests, regression, spatial autocorrelation, ANOVA, etc.) are discussed in the Data Analysis section/methodology chapter. Research design covers overall strategy, data collection covers instruments and sampling, and hypothesis states predictions. Data analysis details how data will be processed.

83. Which seismic waves carry most of an earthquake's energy and cause the most destruction? (1)
- A. P-waves
B. S-waves
C. ✓ **Surface waves**
D. Body waves

Answer: C

Surface waves (Love waves and Rayleigh waves) propagate along Earth's surface, travel slower than body waves, but have larger amplitudes and cause most ground shaking, structural damage, and destruction. Body waves (P-waves compressional, S-waves shear) travel through Earth's interior and cause less surface damage.

84. Which of the following statements provides a CORRECT analytical distinction between a research method and research methodology? (1)

- A. ✓ **Research methodology guides to conduct scientific research**
- B. Research method has a wider scope than research methodology
- C. Research methodology is limited to collecting and organizing data to solve problems
- D. Research method justifies the philosophical foundation of the research

Answer: A

Research methodology is the broader, strategic framework that justifies philosophical assumptions, research design, and overall approach (e.g., quantitative, qualitative, mixed-methods). Research methods are specific tools/techniques for data collection (surveys, interviews) and analysis (statistics, thematic analysis). Methodology guides the entire research process, including methods selection.

85. Which of the following is a challenge to environmental sustainability? (1)

- A. Use of renewable energy
- B. Slow growth of population
- C. Environmental movements
- D. ✓ **Rapid urbanization**

Answer: D

Rapid urbanization challenges sustainability through habitat loss, increased pollution, high energy and resource consumption, waste generation, urban heat islands, and pressure on water/food systems. Renewable energy, slow population growth, and environmental movements are positive for sustainability, not challenges.

END OF THE MARKING KEY

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