



SIR ARTHUR LEWIS COMMUNITY COLLEGE
ACADEMIC YEAR (2024/2025) – SEMESTER TWO
END OF SEMESTER EXAMINATION
Alternate

COURSE CODE : GEO301
COURSE TITLE : Water Policy and Management
LECTURER(S) : Nadia Joseph
DATE :
TIME :
DURATION : 1 hour 30 mins
STUDENT ID # : _____



GENERAL INFORMATION AND INSTRUCTIONS

- Students must sign **IN** and **OUT** on the examination class list.
- Write your ID number on the question paper.
- This paper has 60 questions.
- Circle the correct answer on the question paper.

Question	Student’s mark	Moderated mark
1-60		
TOTAL		

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Instructions: This paper has 60 multiple choice questions. There are four options for each question. Choose the most suitable option by circling the letter on the question paper.

1. Which country has the largest freshwater resources in the world?
 - A. Brazil
 - B. Russia
 - C. Canada
 - D. United States
2. What is the primary source of fresh water in Saint Lucia?
 - A. Glaciers
 - B. Rainfall
 - C. Desalination
 - D. Groundwater
3. What are the three main components of the hydrologic cycle?
 - A. Evaporation, Infiltration, Desalination
 - B. Filtration, Distillation, Condensation
 - C. Evaporation, Condensation, Precipitation
 - D. Rainfall, River Flow, Groundwater Recharge
4. Which human activity has a significant impact on watershed health?
 - A. Deforestation
 - B. Eco tourism
 - C. Forest exploration
 - D. Botanical gardens
5. What is the primary cause of eutrophication in rivers?
 - A. Acid rain
 - B. Low turbidity
 - C. Increased dissolved oxygen
 - D. High levels of nitrates and phosphates
6. Which of the following is NOT a major principle of water resource management?
 - A. Efficient water use
 - B. Climate resilience
 - C. Water quality monitoring
 - D. Disposal of industrial waste
7. What is the main objective of water tariffs?
 - A. To promote water wastage
 - B. To eliminate public access to water
 - C. To encourage conservation of water
 - D. To make water expensive for poor people
8. Which of the following is not a principle of the systems approach to NRM?
 - A. Fairness
 - B. Transparency
 - C. Privatization
 - D. Adaptability

9. Which component is not a part of a water budget?
 - A. Precipitation
 - B. Sediment load
 - C. Evapotranspiration
 - D. Groundwater recharge
10. If a government wants to reduce agricultural runoff, which of the following policies would be most effective?
 - A. Banning all pesticides and fertilizers
 - B. Allowing unrestricted irrigation practices
 - C. Increasing industrial production to offset agricultural pollution
 - D. Implementing buffer zones and vegetation strips along water bodies
11. How does climate change affect water budgets?
 - A. It affects precipitation patterns
 - B. It has no significant impact on water storage
 - C. It only impacts groundwater storage but not surface water
 - D. It leads to a direct increase in water availability worldwide
12. If a government is considering adaptive planning for climate change, what would be the best strategy?
 - A. Ignoring the role of water in climate change policies
 - B. Relying on historical climate data without making changes
 - C. Designing flexible policies to adjust to changing climate conditions
 - D. Implementing a one-time water conservation effort without monitoring
13. What is the main reason why nonpoint source pollution is harder to regulate?
 - A. It only affects agricultural regions
 - B. It is only caused by natural events
 - C. It is always visible and easily tracked
 - D. It originates from multiple, diffuse sources
14. If you were tasked with designing a sustainable water management plan, which principle would be the most critical?
 - A. Maximizing industrial water use
 - B. stakeholder consultation with indigenous people
 - C. Implement integrated watershed management strategies
 - D. Reducing the availability of water to discourage overuse
15. An environmental scientist proposes increasing vegetation cover in watersheds as a way to improve water quality. What is the best justification for this approach?
 - A. Trees consume excess water, reducing supply
 - B. More vegetation increases direct water pollution
 - C. Vegetation stores on pollutants in their roots on water pollution
 - D. Vegetation reduces nutrient and sediment runoff into water bodies
16. A small rural community in a developing country experiences water scarcity while a nearby city receives an abundant water supply. What is the most likely cause of this inequality?
 - A. The city has a more efficient water governance system
 - B. Water allocation is prioritized for higher population areas
 - C. Rural communities have access to natural water streams
 - D. Water scarcity is not a real issue for persons in rural areas
17. Which of the following strategies would be most effective in improving water equity for rural communities?
 - A. Restricting urban water consumption
 - B. Implementing rainwater harvesting systems
 - C. Encouraging water-intensive industries
 - D. Reducing monitoring of water distribution

18. Which of the following is the most effective way to manage environmental water under increasing climate change threats?
- A. Increasing the number of reservoirs
 - B. Expanding urban water supply networks
 - C. Implementing adaptive environmental water delivery methods
 - D. Reducing household water consumption
19. If you were tasked with designing an Integrated Water Resources Management (IWRM) plan for a Caribbean nation, what key challenge would you prioritize based on existing regional obstacles?
- A. Agricultural water pricing reforms
 - B. Reducing international trade dependencies
 - C. Strengthening cross-sectoral governance structures
 - D. Promoting private sector investment in water conservation
20. A local government is facing groundwater depletion due to excessive abstraction. Which policy measure would best mitigate the issue?
- A. Imposing a total ban on groundwater use
 - B. Expanding surface water storage systems
 - C. Encouraging desalination as an alternative water source
 - D. Establishing a groundwater recharge zone and regulating abstraction
21. Given that climate change increases uncertainty in water availability, how should Integrated Water Resources Management (IWRM) be adapted?
- A. Encourage short-term water conservation campaigns
 - B. Rely more on past hydrological data to predict trends
 - C. Prioritize urban water supply over environmental needs
 - D. Develop flexible and adaptive water allocation systems
22. A nation is experiencing both severe droughts and flooding events. Which approach would be the most effective in managing these extremes?
- A. Building more water storage reservoirs
 - B. Increasing groundwater extraction during droughts
 - C. Expanding urban drainage systems to reduce flooding
 - D. Encouraging rainwater harvesting at the household level
23. A city experiencing rapid urban expansion is struggling to maintain sustainable water supplies. Which factor should urban planners analyze first?
- A. The capacity of existing water infrastructure
 - B. The pricing mechanisms for industrial water use
 - C. The residential demand on water in the suburban areas
 - D. The annual rainfall and evaporation patterns of the region
24. If an aquifer shows increasing levels of nitrate contamination in a rural area, what is the most probable cause?
- A. Open latrines
 - B. Overuse of fertilizers
 - C. Increased groundwater extraction
 - D. Reduced water demand from industries
25. Which scenario best illustrates the impact of water mismanagement on economic sustainability?
- A. Increased water tariffs encouraging conservation
 - B. Strict regulations reducing pollution in water bodies
 - C. Public investments in desalination plants for tourism
 - D. Over-extraction of groundwater leading to agricultural decline

26. A country is considering large-scale desalination as a solution to its water shortages. What should policymakers evaluate before implementation?
- A. The increase in recreational water use
 - B. The availability of fresh springs and aquifers
 - C. The cost-benefit ratio of alternative options
 - D. The number of industries that would use the water
27. What is the main ethical concern regarding water allocation in regions facing scarcity?
- A. The cost of upgrading water infrastructure
 - B. Economic losses due to inefficient water use
 - C. The impact of water pricing on industrial sectors
 - D. Ensuring equitable access to water for all social groups
28. A Caribbean country is struggling with water pollution from untreated wastewater. Which approach should be prioritized to improve water quality?
- A. Investing in decentralized wastewater treatment
 - B. Relying on natural water purification processes
 - C. Expanding bottled water distribution to rural communities
 - D. Encouraging voluntary pollution reduction among industries
29. A city is designing a flood prevention strategy that incorporates natural solutions. What should be a key feature?
- A. Increasing the height of concrete levees
 - B. Expanding underground stormwater tunnels
 - C. Addition of artificial barriers to natural vegetation
 - D. Restoring wetlands and constructing green infrastructure
30. A country is considering adopting a national IWRM framework. What should be the first step in the process?
- A. Prioritizing private-sector control over water management
 - B. Setting up a public awareness campaign on water conservation
 - C. A comprehensive assessment of existing water resources and policies
 - D. Implementing strict water allocation quotas and pricing before research
31. As a policymaker, how would you ensure long-term sustainability in water resource management?
- A. Relying on short-term water rationing policies
 - B. Focusing solely on economic incentives to drive water conservation
 - C. Increasing groundwater extraction to meet immediate and future demands
 - D. Integrating environmental, economic, and social considerations into all water policies
32. If an area experiences heavy rainfall over a short duration, which impact is most likely to occur?
- A. Increased evapotranspiration rates
 - B. High-intensity runoff leading to flash floods
 - C. Increased soil moisture without surface runoff
 - D. Increased infiltration and groundwater recharge
33. An engineer is studying the relationship between rainfall intensity and runoff. Which factor is least likely to affect runoff rates?
- A. Soil permeability
 - B. Vegetation cover
 - C. Rainfall duration
 - D. Cloud formation altitude
34. What is the primary reason for applying a synthetic unit hydrograph instead of using direct rainfall-runoff data?
- A. To determine groundwater recharge rates
 - B. To measure actual river discharge directly
 - C. To estimate flood peaks in ungauged watersheds
 - D. To reduce the impact of climate change on hydrological models

35. If an area experiences significant deforestation, what is the most likely consequence on the local runoff and infiltration rates?
- A. No change in infiltration or runoff
 - B. Decreased infiltration and increased surface runoff
 - C. Increased infiltration and decreased surface runoff
 - D. Decreased surface runoff and increased groundwater storage
36. A region is planning to implement flood frequency analysis for disaster preparedness. What is the most critical limitation of this method?
- A. It is too complex for hydrologists to apply
 - B. It does not provide accurate rainfall intensity values
 - C. It cannot account for future climate change impacts
 - D. It ignores variations in land use and watershed characteristics
37. A hydroelectric plant is being designed for a river system. What is the most important factor in determining energy production capacity?
- A. The river's water quality
 - B. The width of the river channel
 - C. The number of tributaries feeding the river
 - D. The combination of water flow rate and hydraulic head
38. What is a watershed?
- A. A desalination plant
 - B. A storage facility for drinking water
 - C. A government policy on water management
 - D. A land area where all water drains to a common point
39. What does the term 'water scarcity' mean?
- A. A policy that regulates water pricing
 - B. Reduced amount of water in pipelines
 - C. A situation where water demand exceeds supply
 - D. A situation where water is available but mismanaged
40. Given the effects of climate change on rainfall patterns, what innovative approach should water resource managers adopt?
- A. Relying on historical rainfall data without modifications
 - B. Developing dynamic and adaptive water management models
 - C. Increasing reliance on desalination as the primary water source
 - D. Eliminating flood prediction models due to increased variability
41. You are tasked with developing a runoff control strategy for an agricultural watershed. What approach would be most effective?
- A. Removing all vegetation to increase drainage
 - B. Building more asphalt roads to channel water
 - C. Implementing contour farming and terracing
 - D. Encouraging excessive irrigation to prevent runoff
42. What is *effective rainfall* in the context of hydrology?
- A. The total volume of rainfall that contributes to groundwater recharge.
 - B. Rainfall that immediately runs off the surface without infiltrating the soil.
 - C. The total amount of rainfall received in a given area, including evaporation and infiltration.
 - D. The portion of rainfall that is available for plant growth after losses due to evaporation, runoff, and deep percolation.
43. A community is looking to implement hydropower as a renewable energy source. What key environmental consideration should they assess before constructing a dam?
- A. The aesthetic appeal of the dam
 - B. The impact on fish populations
 - C. The potential for methane emissions
 - D. The effect on recreational boating activities

44. A farmer observes that despite frequent irrigation, some crops are showing signs of water stress. Which factor should be examined first to determine whether the irrigation is effective?
- A. The soil water infiltration rate
 - B. The amount of groundwater available
 - C. The overall precipitation in the region
 - D. The potential evapotranspiration rate
45. Which irrigation method prevents excessive evaporation and water loss?
- A. Flood irrigation
 - B. Surface irrigation
 - C. Sprinkler irrigation
 - D. Subsurface irrigation
46. A newly constructed farm is trying to determine the most effective irrigation schedule based on potential evapotranspiration (PET). How should they analyze PET data?
- A. Compare PET values across seasons
 - B. Only use PET values from the wet season
 - C. Apply a standard PET value for all crops
 - D. Ignore PET values and rely only on rainfall
47. A researcher is trying to assess water balance in a given agricultural field. Which combination of data should they collect?
- A. Rainfall, soil depth, and wind speed
 - B. Air temperature, humidity, and slope angle
 - C. Groundwater level, solar radiation, and crop yield
 - D. Crop evapotranspiration, soil moisture, and precipitation
48. A scientist notices a significant difference in the rate of infiltration between two fields. What could be a logical reason for this variation?
- A. The amount of crop evapotranspiration
 - B. The number of plants grown per hectare
 - C. Differences in soil permeability and texture
 - D. The presence of an underground drainage system
49. A developing country wants to improve water access while maintaining affordability. Which approach should they take?
- A. Privatize the water supply
 - B. Purchase riparian rights
 - C. Expand public water infrastructure
 - D. Promote rainwater harvesting only in rural areas
50. Which of the following Sustainable Development Goals (SDGs) are directly related to water management?
- A. SDG 6 and SDG 14
 - B. SDG 12 and SDG 11
 - C. SDG 1 and SDG 13
 - D. SDG 9 and SDG 12
51. Which water quality parameter is crucial for aquatic life survival?
- A. Nitrates
 - B. Iron content
 - C. Phosphorus
 - D. Dissolved Oxygen
52. What is the acceptable pH range for drinking water?
- A. 4.0 - 5.5
 - B. 6.5 - 8.5
 - C. 9.0 - 11.0
 - D. 3.5 - 4.5

53. Which of the following best describes transboundary water pollution?
- A. Water pollution caused by climate change only
 - B. Water contamination that affects only urban areas
 - C. Water pollution that moves from one country to another
 - D. Pollution from a single factory dumping waste into a river
54. What should be the first step in setting up a water budget for a watershed?
- A. Measuring air pollution levels
 - B. Estimating annual population demand
 - C. Determining the economic value of water resources
 - D. Identifying the inputs and outputs of water within the system
55. According to the United Nations Economic Commission for Europe (UNECE), equitable access to water should be:
- A. Limited to urban populations
 - B. Provided only to industrial users
 - C. Restricted to wealthy individuals who can afford private water sources
 - D. Adequate in both quantity and quality for all members of the population
56. Which of the following is not a major challenge in equitable water distribution?
- A. Climate change
 - B. Inadequate infrastructure
 - C. Unequal population density
 - D. Variations in land temperature
57. A region is experiencing increasing salinity in groundwater supplies. Which factor is most likely responsible for this change?
- A. Increased rainfall
 - B. High rates of abstraction
 - C. Improved irrigation methods
 - D. Expansion of green spaces
58. Which sector uses the largest share of available freshwater globally?
- A. Agriculture Industry
 - B. Manufacturing sector
 - C. Domestic and recreation
 - D. Hydropower generation
59. What is the most effective way to mitigate urban flooding due to high-intensity rainfall?
- A. Promoting green infrastructure
 - B. Increasing the height of levees
 - C. Expanding underground drainage systems
 - D. Diverting runoff directly into nearby water bodies
60. A city plans to construct a dam for flood control and hydropower. What key factor should engineers analyze first?
- A. Historical rainfall patterns only
 - B. Flood frequency and magnitude data
 - C. Population density in the surrounding region
 - D. The number of hydropower plants in the region

END OF EXAMINATION