

**Environmental Health Sciences  
Self-Study Course SS3010-G**

**Lesson 12: *Environmental Engineering, Planning, and Impact Analysis***

**Part I: Multiple Choice**

1. Plan implementation involves each of the following areas **except**
  - a. regulations, laws, and ordinances
  - b. capital improvement programs and financing plans
  - ☒ c. detailed technical advancements in systems operations
  - d. administrative organizations.
2. The Quality of Life Index (QLI) is based on
  - ☒ a. the interaction of the various factors in the environment on humans
  - b. the control of forces around us and the extent to which they are properly balanced
  - c. administrative and legal standards which constitute the way an individual perceives the quality of life
  - d. medical experts in various fields.
3. General overall policy planning includes all of the following **except**
  - a. aspirations and realistic objectives
  - ☒ b. detailed engineering and specific architectural project plans
  - c. identification of goals
  - d. establishment of functional priorities.
4. The Overseas Development Council has created a Physical Quality of Life Index by combining assessments of
  - a. water supplies with agriculture production
  - b. environmental factors with population
  - ☒ c. literacy rates, life expectancy and infant mortality rates
  - d. economic standards and geographic location.

5. In research and problem identification, the evaluation of the community contains all the following **except**
- ☒ a. transportation systems
  - b. population and demographic studies
  - c. special planning studies
  - d. economic studies and proposals.
6. When developing a preliminary or feasibility report, which of the following steps would **not** be included?
- ☒ a. environmental impact study
  - b. cost estimates
  - c. construction plans
  - d. methods of financing.
7. Plan preparation (Step 3) of the process of comprehensive community planning contains all of the following **except**
- a. special planning studies
  - b. transportation or circulation plans
  - c. environmental engineering plans
  - ☒ d. public institutions plans.
8. The process of comprehensive community planning includes all of the following **except**
- a. a statement of goals and objectives
  - b. public information and community action
  - ☒ c. surrounding area politics
  - d. basic studies, mapping, and data analysis.
9. Which of the following duties of state and local health agencies ensures that public health and welfare are protected?
- ☒ a. regulatory responsibilities
  - b. community planning
  - c. plan preparation
  - d. plan implementation.

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10. Public awareness demands a quality of environment that provides fundamental needs such as which of the following?
- a. pure water, clean air, pure food
  - b. decent housing
  - c. safe recreational facilities
  - ☒ d. all of the above.
11. Comprehensive community planning includes which of the following steps?
- a. public information and involvement
  - b. statement of goals
  - c. basic studies
  - ☒ d. all of the above.
12. Comprehensive planning is also referred to as
- ☒ a. general planning
  - b. preliminary studies
  - c. comprehensive functional planning
  - d. definitive planning.
13. A charging hopper, gas cooling, and particulate removal are essential in the disposal of what types of wastes?
- ~~☒ a. garbage disposal~~
  - b. paper products
  - ☒ c. solid wastes
  - d. liquid wastes.
14. Which of the following factors is not considered in of need of control by the WHO health goal?
- a. physical well being
  - ☒ b. achievement of individual wealth
  - c. mental well being
  - d. social well being.



15. The proper sequence of solid waste entering the incinerator process and environmental engineering control is
- a. dumping platform, storage, charging hopper, residue quenching, wastewater treatment
  - ☒ b. dumping platform, storage, charging hopper, drying and ignition combustion, gas cooling, particulate removal
  - c. dumping platform, charging hopper, storage, drying and ignition combustion, residue quenching, particulate removal
  - d. dumping platform, drying and ignition combustion, gas cooling, storage, charging hopper, particulate removal.
16. The purpose of public information and community action is which of the following?
- a. to stimulate and provide channels for individuals to respond with information and ideas
  - b. to keep the public informed
  - c. to allow the planner to have a better relationship with the public
  - ☒ d. all of the above.
17. Adequate highways, land-use controls, park and recreation facilities, water, sewers, solid waste disposal, and other services necessary for proper community functions are usually designed within the context of a \_\_\_\_\_ plan.
- a. national
  - ☒ b. regional
  - c. metropolitan
  - d. county.
18. Several proposals to establish a QOL index were investigated by
- a. Hornback
  - b. Smith
  - ☒ c. Lewis
  - d. Peale.
19. There is an urgent need for more engineering in community planning
- a. at the individual level
  - b. at the community level
  - ☒ c. at the area-wide, metropolitan, and regional level
  - d. at the national level.

20. Comprehensive planning includes
- a. physical and social factors
  - b. economic factors
  - c. ecologic factors
  - ☒ d. all of the above.
21. Due to political boundaries, the costs of implementing services for community functions are best handled by
- ☒ a. local governments
  - b. state governments
  - c. metropolitan regions
  - d. federal governments.
22. In the quality of life index, the economic environment includes all of the following **except**
- a. income
  - b. work satisfaction
  - c. economic security
  - ☒ d. material quality.
23. An outline of a regional or area-wide planning study and report includes which of the following elements?
- ☒ a. purpose and scope
  - b. administration and financing
  - c. the comprehensive regional plan
  - ☒ d. all of the above.
24. The smallest practical planning unit involved in the development of environmental engineering controls is
- a. the county
  - b. the state
  - c. the district
  - ☒ d. the community.

25. What is the smallest practical planning unit involved in regional planning?

- ☒ a. the individual
- b. the village
- c. the county
- d. the city.

**Part II: Multiple Choice**

1. General obligation bonds used for financing municipal capital improvement are repaid by
  - a. sales tax
  - ☒ b. real property tax
  - c. local industry special tax
  - d. private investors with limited ownership.
2. Revenue bonds are usually repaid by
  - a. state taxes
  - ~~b. interest from foreign loans~~
  - ☒ c. specific sources of revenue (such as water charges)
  - ~~d. credit.~~
3. A comprehensive water supply study must include
  - a. trunk lines and pumping stations
  - b. handling of special wastes
  - ☒ c. alternative sources of water
  - d. grit screening and sludge disposal.
4. The amount of debt a municipality may incur is determined by
  - a. the mayor
  - b. the contractor
  - c. the local Board of County Commissioners
  - ☒ d. the constitution or laws of a state.
5. General obligation bonds
  - ☒ a. guarantee payment by the municipality through a government tax
  - b. are paid back by all the people in the community
  - c. may be used to pay off a revenue-producing capital improvement
  - d. all of the above.



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6. One method of financing for a municipal capital improvement is by revenue bonds which in turn are paid by
- ☒ a. all persons in a given developed community
  - b. state revenues
  - c. persons receiving the service
  - d. federal revenues.
7. The ideal comprehensive regional plan would be one that combines
- ☒ a. legal, political and socioeconomic factors
  - b. all the project physical planning studies of a comprehensive economic and social development plan
  - c. security considerations along with inter-regional communications and cooperation
  - d. obvious environmental design with a minimum of human engineering techniques.
8. Most of the funding for municipal capital improvement is provided by
- a. donations
  - b. state funds
  - ☒ c. revenue bonds and general obligation bonds
  - d. loans.
9. A comprehensive solid waste study must include
- a. preliminary analysis for solid waste treatment and disposal
  - b. administration and financing
  - c. project study
  - ☒ d. a comprehensive regional plan.
10. When a suitable site is being selected for a particular purpose, which of the following must be known before any property is investigated?
- a. the type of facility that is to be maintained
  - b. the desired use of the facility
  - c. the type functions, activities, and programs to be held
  - ☒ d. all of the above.



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11. An ad valorem tax is
- a. a home sales tax
  - b. a non-proportionate tax for service
  - ☒ c. a proportionate service tax
  - d. an alternate tax.
12. Actions which do **not** individually or cumulatively have a significant effect on the human environment are categorically defined as
- a. environmental impact
  - b. cumulative impact
  - c. environmental document
  - ☒ d. categorical exclusion.
13. Which of the following is **not** a recommendation for topography and site survey?
- ☒ a. careful investigation of the property
  - ☒ b. former plot plans
  - c. assistance by a cooperative neighbor
  - ☒ d. water supply source that is fast moving.
14. The National Environmental Policy Act (NEPA) of 1969 made it the responsibility of the Federal Government to use all practical means to coordinate \_\_\_\_\_ to encourage harmony between man and his/her environment.
- a. federal plans
  - b. federal functions
  - c. federal programs
  - ☒ d. all of the above.
15. If an adequate, satisfactory, and safe water supply is not obtainable at a reasonable cost, the site should be
- a. connected to a city water supply
  - b. temporarily abandoned
  - c. abandoned
  - ☒ d. a and b.

16. The most important factor leading to the abandonment of a site is related to
- a. an adequate, safe sewage disposal system
  - b. an adequate, safe solid waste disposal system
  - c. the adequate, safe generation of electricity
  - ☒ d. an adequate, safe water supply.
17. A special engineering study is required for slopes with an incline greater than
- a. 8 percent
  - b. 6 degrees
  - c. 8 degrees
  - ☒ d. 4 percent.
18. To receive maximum benefit from the morning sun, building locations should have what directional exposure?
- a. eastern or northern
  - b. western or northern
  - c. western or southern
  - ☒ d. eastern or southern.
19. To determine the resources on a section of property, one should seek the assistance of a person who is experienced and familiar with
- a. geology and wildlife
  - b. forestry and engineering
  - c. hydrology and chemistry
  - ☒ d. a and b above.
20. The selection of a site for a public building often requires improvements. An undesirable feature that can often be remediated for public health reasons concerns is
- a. a sloped desert area
  - b. a high rocky area
  - ☒ c. a low swampy area
  - d. a dry mountain area.

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21. After a building site is selected, a complete large-scale topographical map should be prepared with a scale of 1 inch = 100 feet and with contours at \_\_\_\_\_ intervals.
- ☒ a. 5-foot
  - b. 10-foot
  - c. 15-foot
  - d. 30-foot.
22. What led to the formation of the NEPA?
- ☒ a. public concern over environmental pollution
  - b. scientific support
  - c. professional prodding and support
  - d. all of the above.
23. For generally characterizing soils, borings made for soil samples are <sup>to</sup> ~~at~~ a depth of about \_\_\_\_\_.
- ☒ a. 9 feet
  - b. 10 feet
  - c. 13 feet
  - d. 15 feet.
24. The purpose of the National Environmental Policy Act is to
- a. encourage productive and enjoyable interaction between human and the environment
  - b. encourage measures that prevent or eliminate damage to the environment
  - c. encourage greater understanding of the environment
  - ☒ d. all of the above.
25. Which of the following features of a proposed site would be desirable?
- a. excessive dust or dampness
  - ☒ b. minimal traffic with adjoining areas not interfering with proposed site
  - c. saturated soils and presence of saprolite
  - ☒ d. a private solid waste disposal system.

**Part III: Multiple Choice**

1. \_\_\_\_\_ was responsible for preparing a circular to help determine "the probable impact of the proposed action on the environment."
  - a. Sadesky
  - b. Miller
  - ☒ c. Leopold
  - d. Randall.
2. The Council on Environmental Quality was established by
  - a. Title II of DSEA
  - b. Title IV of PHSA
  - c. Title VI of USEA
  - ☒ d. Title II of NEPA.
3. The natural and physical environment and the relationship of people with that environment describes
  - a. The native environment
  - b. The primary human climax community
  - c. The realm of human influence
  - ☒ d. The human environment.
4. The term "Federal agency" does **not** include which of the following
  - a. the executive office
  - ☒ b. general local government
  - c. all agencies of the federal government
  - d. indian tribes assuming NEPA responsibilities.
5. An "environmental assessment" developed under NEPA is
  - a. an environmental evaluation dealing with fish
  - ☒ b. a concise public document for which a Federal agency is responsible
  - c. a public document of environmental concern dealing with acid rain only
  - d. an environmental evaluation dealing with air pollution control.



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6. The agency that developed guidelines to assist urban areas and cities assess the environmental impact of housing and urban development was
- a. the U.S. Environmental Protection Agency
  - b. the U.S. Department of Health, Education, and Welfare
  - c. the U.S. Department of Housing and Construction
  - ☒ d. the U.S. Department of Housing and Urban Development.
7. The environmental impact statement
- a. is required by law
  - b. is a written description of legislative proposals and actions affecting the quality of the human environment
  - c. is not required to meet standards in H.B. Sec. 102 (2) C
  - ☒ d. must be included in all proposed programs and concepts, plans, and construction projects.
8. \_\_\_\_\_ involve(s) consideration of ground and surface water conditions, soil and topographic features, solid waste generation, and social economic factors.
- a. regional concerns
  - b. site operation
  - ☒ c. site selection
  - d. land-use objectives.
9. An environmental impact statement should contain all of the following except
- a. project description and land-use relationships
  - b. probable impact of the proposed action on the environment
  - c. probable adverse environmental effects which can be avoided
  - ☒ d. relationship between local short-term uses of the environment and enhancement of long-term productivity.
10. The Council on Environmental Quality requires \_\_\_\_\_ to submit an Environmental Quality Report to Congress.
- ☒ a. the President
  - b. each representative
  - c. the governor of each state
  - d. federal agencies.

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11. \_\_\_\_\_ developed a set of guidelines to aid urban areas and cities assess the impacts of development actions.
- a. NEPA
  - ☒ b. HUD
  - c. the Council on Environmental Quality
  - d. the Overseas Development Council.
12. According to the Bureau of the Census, the rural and suburban areas
- ☒ a. have shown an increase in population since 1970
  - b. have shown a decrease in population since 1970
  - c. are considered high taxed areas
  - d. will predict future population growth.
13. The \_\_\_\_\_ in many cities has been leveling off, but has been increasing in the suburbs.
- a. pollution rate
  - ☒ b. rate of population growth
  - c. use of private automobiles
  - d. use of public water.
14. Suburban areas account for \_\_\_\_\_ percent of the population in 1988, as compared to \_\_\_\_\_ percent in 1970.
- ☒ a. 44.8 and 36.5
  - b. 45.7 and 37.2
  - c. 37.2 and 45.7
  - d. 36.5 and 37.2.
15. Which one of the following would be considered primary gain for moving from the city into a suburban area?
- a. fire protection
  - ☒ b. lower taxes
  - c. better schools
  - d. improved sanitary conditions.

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16. For every 1,000 new people, a community will require all of the following **except**
- ☐ a. the collection and disposal of 548 to 730 tons of solid waste per year
  - ☒ b. an additional supply of 10 to 30 million gallons of water per year
  - c. 10.0 or more acres of land for schools, parks, and play areas
  - d. two to four additional hospital beds and three nursing home beds.
17. Federal air quality standards for sulfur oxides in parts per million is
- a. 3.0
  - ☒ b. 0.03
  - ☒ c. 0.3
  - d. 0.003.
18. \_\_\_\_\_ assists in economic growth by increasing personal income, retail sales, and bank deposits.
- ☒ a. development of local business
  - b. rezoning
  - c. industry
  - d. subdividing.
19. The minimum sulfur dioxide concentration for vegetation damage is
- a. 10 ppm
  - ☒ b. 3 ppm
  - c. 0.20 ppm
  - d. 0.03 ppm.
20. The nitrogen dioxide below \_\_\_\_\_ ppm does not pose a health problem.
- a. 0.15
  - b. 0.05
  - ☒ c. 0.50
  - d. 0.005.
- Handwritten notes:*  
1 acre / 1000 parks,  
10 acre high school,  
PS 233  
PS 233



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21. The EPA stream quality indicator for dissolved oxygen in stream water is
- a. 3 mg per liter
  - ☒ b. 4 mg per liter
  - c. 5 mg per liter
  - d. 6 mg per liter.
22. If a sample of water contains 5,000 fecal coliform colonies per 100 ml of water, it is placed in which environmental impact category?
- ☒ a. 2
  - b. 3
  - c. 4
  - d. 5.
23. The EPA stream water quality rate for fecal coliform is
- ☒ a. 200 colonies per 100 ml
  - b. 300 colonies per 100 ml
  - c. 100 colonies per 100 ml
  - d. 400 colonies per 100 ml.
24. Communities that desire to maintain the character of the community without overtaxing its members should
- a. develop zoning regulations
  - b. develop higher taxes on community organizations
  - c. encourage the development of vacant land served by existing public services
  - ☒ d. a and c above.
25. If the air in a community contains 0.10 to 0.17 parts per million of sulfur oxide, it is considered to be \_\_\_\_\_ quality air.
- a. high
  - ☒ b. moderate
  - c. poor
  - d. extremely poor.

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**Part IV: Multiple Choice and True-False**

1. The turbidity of water to be treated by slow sand filtration should **not** exceed
  - a. 50 NTU
  - ☒ b. 25 NTU
  - c. 10 NTU
  - d. 30 NTU.
  
2. The lack of comprehensive planning and controls for developments and subdivisions results in
  - a. poor drainage
  - b. inadequate public utilities
  - c. undersized streets
  - ☒ d. all of the above.
  
3. A certificate of compliance is issued by the \_\_\_\_\_ when a system is properly installed.
  - ☒ a. manufacturer
  - ☒ b. health department
  - c. EPA
  - d. property owner.
  
4. A city, village, or town may adopt a local sewage and waste ordinance as part of its \_\_\_\_\_ depending on its availability and effectiveness.
  - a. sanitary code
  - b. zoning ordinance
  - c. building code
  - ☒ d. all of the above.
  
5. Haphazard development can be controlled by comprehensive local and regional planning if
  - a. public powers levy higher taxes
  - b. public powers regulate development
  - ☒ c. broad public powers and regulatory authority are provided
  - d. none of the above.
  
6. Subdivision plans involving individual wells and sewage disposal systems
  - a. comply with Federal laws only in subdivisions of 25 lots or less
  - b. can never supersede state or federal laws by the use of title stipulation
  - ☒ c. must be adapted to the topography and geological formations existing
  - d. none of the above.

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7. A planning board's enforcement tools include
  - a. subdivision regulations
  - b. zoning codes
  - c. guidance of improvement programs
  - ☒ d. all of the above.
8. The preferred method for water and sewerage service for a subdivision is to
  - a. develop a central water system
  - b. extend existing water lines and construct individual sewage system
  - ☒ c. extend existing water lines and community sewer lines
  - d. require individual on-site facilities.
9. The generally accepted method(s) of preventing subdivision complications and obtaining orderly community growth is (are)
  - a. comprehensive land-use planning
  - b. education
  - c. effective regulation
  - ☒ d. all of the above.
10. Planning and zoning regulations are based on
  - a. the rights of the government to dictate and control the uses of land for the purpose of development.
  - b. the need to expand the land for development.
  - ☒ c. the rights of the government to exercise its police power to control the private use of land for public benefit.
  - d. the development for growth and development of a region or area.
11. Strategic planning is a tool that helps organizations
  - a. decide where they want to be in the future
  - b. locate where they are now
  - c. plan how to get to the desired state in the future
  - ☒ d. all of the above.
12. Stakeholder Focused Interactive Strategic Planning makes the assumption that stakeholders must
  - a. be willing to invest in the plan for it to succeed
  - b. accept the plan or be run over by it
  - ☒ c. participate in the plan or be left out
  - d. like the organization doing the planning.

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13. A "vision" is a term used in strategic planning to represent the
- ☒ a. desired future state
  - b. where the organization wants to be in 5 years
  - c. the new organizational mission
  - d. all of the above.
14. A SWOT analysis is
- a. an analysis of the future state
  - ☒ b. an analysis of the current state
  - c. a budget process
  - d. none of the above.
15. A GAP analysis is
- a. an analysis of the future state
  - b. an analysis of the current state
  - ☒ c. an analysis of the distance between the current state and the future state
  - d. none of the above.

*True-False: Mark the answer sheet under column "A" if the statement is true, or under column "B" if the statement is false.*

T 16. The topography of a subdivision lot usually determines the location of the well with respect to the sewage disposal system.

17. Plan implementation does include public acceptance.

~~X~~ F ~~X~~ 18. A project study is another term for "comprehensive regional planning." "general planning"

~~X~~ T ~~X~~ Comprehensive community planning attempts to take an overall look at the total region.

F 20. A QOL index is useful in determining future demands made on water supplies in subdivisions.

T 21. Plan implementation involves capital improvement programs and financing plans.

T 22. Financing for municipal capital improvements is generally done by revenue bonds or general obligation bonds.

F 23. Every 1,000 new people in a community will require 1,000,000 extra gallons of water per year. ~25 million

T 24. Stakeholder Focused Interactive Strategic planning is designed to locate common ground held by all stakeholders in the planning process.

25. The assessment of stakeholders values, interests, and expectations can be used to evaluate the probability of success of a strategic plan.