Agriculture and Aquaculture

237. Vitamin A deficiency can cause
   (A) anencephaly
   (B) anemia
   (C) blindness
   (D) goiter
   (E) obesity

238. An insufficient amount of protein and calories in a person's diet can result in
   (A) marasmus
   (B) kwashiorkor
   (C) drowsiness and inactivity
   (D) abdomen swollen with fluid
   (E) gout

239. Obesity is
   (A) when someone is more than 20 pounds over ideal weight
   (B) when someone is more than 30 pounds over ideal weight
   (C) occurring in about one-quarter of the U.S. population
   (D) the result of consuming too many whole grains and vegetables
   (E) occurring in about 62% of the population today

240. Which of these crops are mainly GMO crops?
   (A) soybeans, cotton, and corn
   (B) wheat, rice, and corn
   (C) wheat, cotton, and corn
   (D) potatoes, wheat, and rice
   (E) soybeans, rice, and cotton
241. The ideal method of irrigation for water conservation is
(A) flood irrigation  
(B) ditch irrigation  
(C) sprinkler irrigation  
(D) drip irrigation  
(E) canal irrigation  

242. Bt, or *Bacillus thuringiensis*, belongs to which category of pesticide?
(A) inorganic  
(B) natural organic  
(C) organophosphates  
(D) microbial/biological agents  
(E) carbamates  

243. Agriculture that alternates two or more crops to reduce wind and water erosion is known as
(A) terracing  
(B) shelterbelts  
(C) soil compaction  
(D) contour farming  
(E) strip cropping  

244. The types of crops that are used directly by a farmer or sold locally are
(A) cash crops  
(B) ruminant crops  
(C) subsistence crops  
(D) monoculture crops  
(E) swidden crops  

245. Which of the following types of crops have the benefit of conserving soil, retaining nutrients, and saving energy?
(A) annual crops  
(B) cash crops  
(C) subsistence crops  
(D) monoculture crops  
(E) perennial crops  

246. Which continent has the greatest percentage area of agriculture?
(A) Asia  
(B) Europe  
(C) North America  
(D) Australia  
(E) Africa
247. The National Plant Germplasm System provides
   (A) antimicrobial agents
   (B) cold storage for seeds
   (C) screening for GMOs
   (D) payments to farmers
   (E) protection of soil fertility

248. Which of the following agencies is responsible for destroying shipments of
   food that exceed pesticide limits?
   (A) FDA
   (B) USDA
   (C) EPA
   (D) A and B
   (E) DDT

249. Water pollution and breeding between farmed and wild types put which
    species on the endangered list?
   (A) Atlantic salmon
   (B) Pacific salmon
   (C) tuna
   (D) Atlantic cod
   (E) Peruvian anchovy

250. The optimal growth of a crop can be prevented by a shortage in the soil of
    a chemical element known as
    (A) a macronutrient
    (B) a micronutrient
    (C) a limiting factor
    (D) a fumigant
    (E) Liebig's law

251. In China, desertification has been offset by
    (A) logging the virgin forest
    (B) aquaculture of tuna
    (C) building dams
    (D) diverting rivers
    (E) planting trees
252. Topsoil, the layer of soil that supports crops, is also known as the
(A) litter layer
(B) A horizon
(C) zone of accumulation
(D) C horizon
(E) soil profile

253. An agricultural field that is not harvested for at least a season is
(A) subsidized
(B) terraced
(C) contoured
(D) fallow
(E) tilled

254. Elevated levels of carbon dioxide from global warming have which of the following effects?
(A) insects eating fewer plants
(B) decreased nitrogen in plants
(C) increase in bird populations
(D) increased nitrogen in plants
(E) increase in available farmland

255. Approximately what percentage of crops are destroyed by pests, spoilage, and disease?
(A) 30%
(B) 10%
(C) 50%
(D) 20%
(E) 5%

256. Herbicides account for what percentage of pesticides in U.S. waters?
(A) 80%
(B) 10%
(C) 60%
(D) 5%
(E) 20%

257. Silent Spring is a book published in 1962 that warned of the impact of
(A) deforestation in the Amazon
(B) pesticides and herbicides
(C) nuclear war
(D) population growth
(E) drought on agriculture
258. The Clean Water Act was enacted in
(A) 1977
(B) 1970
(C) 1963
(D) 1912
(E) 1989

259. How many years ago did agriculture and the domestication of animals begin?
(A) 5,000
(B) 13,000
(C) 250
(D) 500,000
(E) 10,000

260. Which of the following is NOT a way that agriculture affects climate?
(A) changing of land cover
(B) increase of carbon dioxide
(C) use of fire to clear land
(D) increase of biological diversity
(E) production/use of fertilizers

261. The diagram in Figure 8.1 illustrates
(A) primary succession
(B) secondary succession
(C) tertiary succession
(D) pioneer plants
(E) no-till agriculture

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**Figure 8.1**

- Slash and burn grasses, weeds, shrubs
- Pine trees
- Dense forest
- Many species
262. Which of the following is true about people in China?
   I. They are consuming more meat products than in the past.
   II. More grain production is required.
   III. China has more agricultural land available now than in the past.
   (A) I only
   (B) II only
   (C) I and II only
   (D) II and III only
   (E) I, II, and III

263. Minimum tillage is a farming technique that
   (A) decreases the use of herbicides
   (B) increases soil compaction
   (C) reduces soil erosion
   (D) increases evaporation of water
   (E) increases energy consumption

264. An organic fertilizer that is made from plowing under plants instead of harvesting them is known as
   (A) green manure
   (B) cow manure
   (C) synthetic fertilizer
   (D) leguminous plants
   (E) green herbicides

265. Pasture is land that
   (A) is burned to provide room for agriculture
   (B) is left fallow for a season
   (C) is not used for ruminants
   (D) is planted with forage for animals
   (E) provides food for animals without planting

266. Which of the following requires the most water to produce?
   (A) potatoes
   (B) rice
   (C) corn
   (D) chicken
   (E) beef
Forestry and Rangelands

270. The major determinants of forest type are
   (A) tree species and animal species
   (B) temperature and rainfall
   (C) elevation and proximity to water
   (D) tree species and elevation
   (E) tree species and rainfall

271. A temperate rain forest, such as the one on the west coast of North America, primarily has
   (A) conifer trees, wet climate, cool temperatures
   (B) flat-leaf trees, wet climate, warm temperatures
   (C) conifer trees, dry climate, cool temperatures
   (D) flat-leaf trees, wet climate, cool temperatures
   (E) conifer trees, wet climate, warm temperatures

272. What percentage of the earth’s original rain forests have been cleared?
   (A) 25%
   (B) 90%
   (C) 10%
   (D) 50%
   (E) 32%

273. Which method of timber harvesting cuts a small percentage of mature trees every 10 to 20 years?
   (A) clear-cutting
   (B) deforestation
   (C) selective cutting
   (D) old-growth harvesting
   (E) industrial logging
274. The USDA cites the greatest number of threatened plant species in which biome?
   (A) tropical rain forest
   (B) desert
   (C) arctic tundra
   (D) temperate forest
   (E) grassland

275. Semiarid grasslands, with a mean rainfall of between \( \frac{1}{4} \) and \( \frac{1}{2} \) cm per year, are also known as
   (A) steppes
   (B) taigas
   (C) deserts
   (D) forests
   (E) chaparrals

276. Which of the following are benefits of forest fires?
   I. pinecones open and release seeds
   II. removal of brush and replenishment of soils
   III. increasing the number of crown fires
   (A) I only
   (B) II only
   (C) I and II only
   (D) II and III only
   (E) I, II, and III

277. The difference between drought and degradation of land is
   (A) degradation is not affected by climate
   (B) degradation results from unsound human activities
   (C) drought is an unnatural event
   (D) degradation increases economic yield
   (E) drought increases biodiversity and economic yield

278. The landscape perspective of environmental science involves
   (A) the protection of local areas such as a stand of trees
   (B) concern for the appearance of the environment
   (C) preserving only what is immediately visible
   (D) protecting individual species by protecting their ecosystems
   (E) protecting land from agricultural use
279. The use of nitrogen by a plant allows it to make
   (A) proteins
   (B) sugar
   (C) CO₂
   (D) O₂
   (E) water

280. The Public Rangelands Improvement Act of 1978 was
   (A) written by ranchers to increase area for grazing
   (B) passed by Congress to reduce grazing where there was damage
   (C) written to improve Native American lands
   (D) responsible for the deterioration of forests
   (E) written to prohibit building houses on grazing land

281. When a forest is harvested at a rate that does not decrease supply year after year, it is said to be
   (A) clear-cut
   (B) sustainable
   (C) old-growth
   (D) suppressed
   (E) deforested

282. In what year was the U.S. Forest Service established?
   (A) 1968
   (B) 1925
   (C) 1905
   (D) 1918
   (E) 1936

283. What is “an area where the earth and its community of life are untrammled by man, where man himself is a visitor who does not remain” as defined by U.S. law?
   (A) biome
   (B) rangeland
   (C) commons
   (D) hectare
   (E) wilderness
The purpose of the Wilderness Act of 1964 was
(A) to change to different methods of timber harvesting in forests
(B) to set aside land owned by the Bureau of Land Management
(C) to protect tropical rain forests in Guam
(D) to set aside primitive forest land for protection
(E) to support businesses promoting such activities as skiing and snowmobiling in wilderness areas

Indirect deforestation is
(A) death of trees from pollution or disease
(B) killing some trees unintentionally during selective cutting
(C) loss of trees from logging
(D) cutting of forests by local people for fuel
(E) timber harvesting of plantation forests

The bottom half of a grass plant that provides food for the plant’s roots is known as the
(A) photosynthetic process
(B) rangeland
(C) primary forest
(D) clear-cut area
(E) metabolic reserve

The trees that grow in the understory of the forest are known as
(A) intermediate
(B) dominants
(C) suppressed
(D) second-growth forest
(E) codominants

Which of the following is NOT a public service function of forests?
(A) slowing of erosion
(B) increasing evaporation of water
(C) providing recreational activities
(D) providing timber
(E) providing habitat for wildlife

What percentage of tropical forest logging is done in a sustainable manner?
(A) 0.1%
(B) 1%
(C) 10%
(D) 25%
(E) 50%
290. Trees are adapted to their own particular environmental conditions, also known as a(n)
   (A) old-growth forest
   (B) landscape
   (C) niche
   (D) community forest
   (E) plantation

291. What makes grasslands so suitable for agriculture?
   (A) They are flat and easier to plow.
   (B) High-quality soil results from a deep organic layer.
   (C) There is a large area available in the world.
   (D) There are no animals that eat the grasses.
   (E) There are few fires.

292. When were domestic animals such as cows brought to North America?
   (A) 1800s
   (B) 1900s
   (C) 1400s
   (D) 1200s
   (E) 1600s

293. Feedlots are damaging to the environment because of
   (A) overgrazing
   (B) deforestation
   (C) erosion
   (D) pollution
   (E) desertification

294. The majority of wood in forests of developing countries is used for
   (A) timber for construction
   (B) firewood
   (C) paper
   (D) furniture
   (E) pulp

295. The primary purpose of parks is for
   (A) conservation
   (B) research
   (C) people
   (D) hunting
   (E) isolation
296. The habitat for spotted owls is
   (A) old-growth forests
   (B) taiga forests
   (C) rangelands
   (D) rain forests
   (E) second-growth forests

297. The maximum number of trees that a piece of land can produce within a certain time frame describes its
   (A) maximum harvest
   (B) silviculture quota
   (C) certification of forestry
   (D) lumber limit
   (E) site quality

298. Brief, intense grazing done by wild herds in which a herd is confined to a small area, eats everything, and fertilizes heavily before moving on is known as
   (A) selective cutting
   (B) clear-cutting
   (C) overgrazing
   (D) rotational grazing
   (E) desertification

299. Forests are disappearing from the world at a fast rate that can be remedied only by better forest management.
   (A) Describe the four different methods of tree harvesting: clear-cutting, strip cutting, selective cutting, and shelterwood cutting.
       (i) Explain the process of each method of harvesting.
       (ii) Describe the environmental drawbacks of each.
       (iii) Describe the benefits of each.
   (B) Describe two methods of maintaining sustainable forestry.
   (C) Discuss two pieces of legislation that were passed to protect forests in the United States.

300. Forest fires are often viewed in a negative light—they threaten lives, burn down beautiful stands of trees, and endanger towns. However, forest fires have many benefits as well that are often overlooked.
   (A) Describe three benefits that forest fires can provide.
   (B) Discuss the purpose of prescribed fires.
   (C) Assume that you own a home in an area that is prone to forest fires. Explain the steps you would take to reduce forest fires on your property.
Land Use

302. People can be “pulled” to emigrate from rural areas into urban areas by
   (A) poverty in rural areas
   (B) lack of agricultural land outside of cities
   (C) lack of jobs outside of cities
   (D) available housing in urban areas
   (E) war in the countryside

303. If 20,000 of a small country’s total population of 1 million live in cities, the country’s degree of urbanization is
   (A) 20%
   (B) 5%
   (C) 2%
   (D) 0.2%
   (E) 0.5%

304. If a country maintains the same total population of 100 but its rural population shrinks from 55% to 52% in one year, what is the urban growth rate for this period, assuming that the rest of the population is composed of city dwellers?
   (A) 2.7%
   (B) 6.7%
   (C) 3.0%
   (D) 0.9%
   (E) 6.3%
305. Of the following statements, which one accurately reflects current urban growth patterns worldwide?
   (A) Urban growth is slower in developed countries than in developing countries.
   (B) Urban poverty is becoming less prevalent.
   (C) City dwellers are staying at a constant percentage of the world population.
   (D) In developing countries, the rural population is becoming a greater proportion of the population.
   (E) The number of megacities worldwide is shrinking slightly.

306. Which of the following statements accurately describes urban growth patterns in the United States?
   (A) Between 1850 and 1900, urban growth stagnated.
   (B) During the mid-20th century, suburbs and small cities lost more people to larger nearby cities than they gained.
   (C) Ongoing migration inside the country is generally headed toward the Southwest.
   (D) The majority of the rural population has migrated to urban areas from rural areas since the 1970s.
   (E) Since the 1980s, the birthrate has been largely responsible for the country’s growing population.

307. All of the following statements are examples of the negative effects of urban sprawl EXCEPT
   (A) an increase in obesity in sprawl areas
   (B) the loss of central city tax bases
   (C) the loss of prime cropland, grass, and forests
   (D) decreased water runoff
   (E) increased surface-water pollution

308. In the United States, urban sprawl was encouraged by the federal government through
   I. loan guarantees for veterans buying new single-family homes
   II. federal funding of highways
   III. the introduction of home-loan deductions for federal income tax
   IV. large federally funded suburban developments outside western U.S. cities
   (A) I, II, and III
   (B) II, III, and IV
   (C) I, III, and IV
   (D) only I and II
   (E) only II and IV
309. People in urban areas often have advantages over rural dwellers, including
(A) lower chances of exposure to hazardous wastes
(B) lower levels of asthma and other respiratory problems
(C) better access to health care and other services
(D) exposure to fewer sources of noise pollution
(E) living where infectious diseases are less able to propagate

310. Cities can put extra stress on the environment’s water resources by
I. depriving nearby, less-developed areas of surface water and groundwater
II. decreasing the amount of water entering soil and groundwater by increasing runoff
III. decreasing nearby cloud formation by producing excess heat and CO₂
IV. contributing to water pollution
(A) I, II, and III
(B) II, III, and IV
(C) I, II, and IV
(D) only I and III
(E) only III and IV

311. In the United States, rail transportation compares favorably to automobile transportation in all of the following areas EXCEPT
(A) flexible transportation schedules
(B) air pollution
(C) energy efficiency
(D) accidental injuries and deaths
(E) contributing to traffic congestion

312. Some U.S. cities including Portland, Oregon, apply zoning, planning, tax breaks, building regulations, and other policies to control sprawl and protect the local environment. This approach is called
(A) fundamental land
(B) reconciliation ecology
(C) cluster development
(D) smart growth
(E) land-use planning
313. One approach to building more efficient housing with recreational space involves concentrating high-density housing in one part of a site and leaving a large proportion for shared open space. This is known as
(A) fundamental land
(B) land-use planning
(C) smart growth
(D) mixed-use development
(E) cluster development

314. Urban planning experts call a neighborhood with stores, light industries, offices, high-density housing, and mass transportation within walking distance
(A) a mixed-use development
(B) smart-growth planning
(C) cluster development
(D) reconciliation ecology
(E) land-use planning

315. In China, developers can face the death penalty for illegally building on arable areas that are designated as
(A) mixed-use zoning
(B) new urban areas
(C) cluster developments
(D) fundamental land
(E) greenbelt

316. Transit corridors connect cities such as Toronto to smaller nearby urbanized areas, with the rest of the area surrounding the city center devoted to recreational open space known as
(A) fundamental land
(B) mixed-use zoning
(C) greenbelt
(D) cluster development
(E) reconciliation ecology

317. The amount of biologically productive area required to support a person and dispose of his or her waste is known as
(A) the free-access resource area
(B) the common-property resource area
(C) the ecological capacity
(D) a sustainable yield
(E) an ecological footprint
318. An equation to estimate a human population’s ecological impact uses the variables $I$ (total impact), $P$ (population size), $A$ (population affluence), and $T$ (population technology level). Using that equation, if $P$ and $A$ both double compared to a previous situation but $T$ remains the same, what happens to $I$?

(A) $I$ drops to zero.
(B) $I$ drops to half its previous value.
(C) $I$ remains the same value.
(D) $I$ increases to four times its previous value.
(E) $I$ cannot be calculated in this case.

319. Flooding is often a bigger problem in cities than in rural areas due to which of the following factors?

I. Cities are often built in coastal areas or on floodplains.
II. Cities’ greater proportion of impervious cover increases runoff.
III. City-related development often damages wetlands that can absorb excess water.
IV. Cities release excess heat and carbon dioxide, which increase local rainfall.

(A) only I and II
(B) only II and III
(C) only I and IV
(D) I, II, and III
(E) II, III, and IV

320. Sewage runoff from human settlements into the oceans can cause all of the following except

(A) harmful algal blooms
(B) exposure of marine life to high levels of infectious bacteria
(C) unusually high levels of human viruses in the water
(D) oxygen-depleted water zones that suffocate marine life
(E) calcium-rich zones that damage fish and shellfish by hardening and stiffening joints

321. Measures that can decrease the prevalence of oxygen-depleted zones include all of the following except

(A) reducing the emission of nitrogen compounds by motor vehicles
(B) constructing industrial-scale saltwater oxygenating plants
(C) improving sewage treatment to reduce the emission of nitrogen compounds into the water
(D) reestablishing coastal wetlands to help absorb excess nitrogen compounds
(E) planting vegetation to absorb extra nitrogen before it reaches rivers, streams, and oceans
322. Which of the following lists of land uses is arranged in order from the largest share of the earth’s terrestrial area to the smallest?
(A) urban space, agricultural land, wooded areas
(B) agricultural land, wooded areas, urban space
(C) wooded areas, agricultural land, urban space
(D) urban space, wooded areas, agricultural land
(E) wooded areas, urban space, agricultural land

323. Most U.S. federal public land is located in the state of
(A) New York
(B) Utah
(C) California
(D) Alaska
(E) Colorado

324. In the United States, parcels of land managed by the Forest Service and the Bureau of Land Management are used for many of the same purposes, with important differences. Unlike land managed by the Forest Service, land under the Bureau of Land Management is NOT often used for
(A) mining
(B) natural gas extraction
(C) livestock grazing
(D) oil extraction
(E) recreation

325. The U.S. Fish and Wildlife Service oversees 542 tracts of land intended mostly for
(A) protecting habitats for game birds and mammals
(B) oil and gas extraction
(C) recreation
(D) historical site preservation
(E) watershed conservation

326. Each set of federally managed areas in the United States has different restrictions on its use. The U.S. federal lands with the most restrictions are known as the
(A) National Forest System
(B) National Resource Lands
(C) National Wildlife Refuges
(D) National Park System
(E) National Wilderness Preservation System
327. Which of the following public land conservation principles have developers and resource-extraction industries in the United States actively opposed?
   I. Protecting the biodiversity should be the primary goal.
   II. Resource extraction should not be government subsidized.
   III. Resource extractors should pay fair compensation for resources removed.
   IV. Everyone using public lands should be liable for environmental damage.
   (A) only I
   (B) I, II, and III
   (C) I, II, III, and IV
   (D) II, III, and IV
   (E) I, III, and IV

328. Biologist Garrett Hardin reasoned that each person degrading free-access, renewable resources feels that an individual person’s impact is nearly imperceptible, that another person is bound to use the same resource in any case, and that as a renewable asset, the resource will rebound. Hardin called the large-scale effect of this mind-set
   (A) the tragedy of the commons
   (B) distorted risk perception
   (C) resistance-to-change environmental management
   (D) the reversibility principle
   (E) short-sighted stewardship

329. Approximately 3.8 billion hectares of earth’s original forests remain. This number represents what proportion of the original total?
   (A) about 5%
   (B) about 20%
   (C) about 50%
   (D) about 70%
   (E) about 90%

330. “A natural, inorganic solid having a particular crystalline structure and chemical composition” is the definition of
   (A) an element
   (B) a mineral
   (C) a compound
   (D) a gemstone
   (E) a fossil fuel
331. The process of using water to wash soil and other unwanted materials to reveal desired minerals is known as
   (A) strip mining
   (B) smelting
   (C) heap-leach extraction
   (D) placer mining
   (E) water mining

332. In 2011, the Australian government produced a report on urbanization suggesting that development in the country should concentrate on filling in urban areas, particularly in derelict sites. Inner cities, said the report, should be connected to transport corridors and green spaces to provide a high standard of living in a more efficient manner. At the same time, Prime Minister Julia Gillard promised to increase job opportunities in outer suburbs, which have fewer community services, such as health, education, and housing facilities.

   (A) In the paragraph above, which stated goal is likely to increase urban sprawl?
   (B) How might filling in urban areas allow people to experience a high standard of living more efficiently?
   (C) How might urban areas with more community services better survive economic fluctuations?

333. In 2009, the PacRim mining company proposed its Chuitna Coal Project in Alaska—a strip mine and associated development that together would cover about 78 square kilometers (about 30 square miles) of the Beluga Coal Fields near the Cook Inlet southwest of Anchorage. Many activists, residents, and fishery experts are concerned that although the company is taking some steps to reduce waste released, the mine will destroy area streams, which are important salmon hatcheries that contribute to the local economy. Mine proponents estimate that the 25-year first phase of the project could create as many as 350 new jobs and stimulate the local economy by involving local businesses. The company also plans to create a major port nearby that could encourage further development of the area, as well as further mining.

   (A) What is strip mining?
   (B) How might strip mining endanger streams and the salmon inhabiting them?
   (C) At what point would the Surface Mining Control and Reclamation Act of 1977 require PacRim to attempt some environmental restoration?
Energy Consumption

335. Compared with the "Calorie" unit that gauges food energy, how large is the "calorie" unit that scientists use for other types of energy?
(A) \( \sqrt[100]{100} \) times as large
(B) \( \sqrt[10]{10} \) times as large
(C) the same size
(D) 10 times larger
(E) 100 times larger

336. Carrying an apple across the room and bringing a pot of water to boil are both best described as examples of
(A) energy
(B) potential energy
(C) electromagnetism
(D) work
(E) material efficiency

337. Which of the following is best described as storage of potential energy?
(A) a rushing river
(B) falling rain
(C) a lake held in by a dam
(D) steam released from a boiling kettle of water
(E) a melting ice cube

338. Work performed per unit of time is called
(A) energy
(B) potential energy
(C) power
(D) the law of conservation of energy
(E) electromagnetism
According to the law of conservation of energy,
(A) power is a measure of the conversion of energy  
(B) work performed on an object results in a change in its energy  
(C) nuclear fusion converts some matter into huge amounts of energy  
(D) potential energy can be converted into kinetic energy  
(E) energy cannot be created or destroyed, only converted into different forms

Using all of the energy she can get from eating a peanut butter and jelly sandwich, a woman takes as many buckets of water to the top of a hill as she can and pours them into a barrel there. She opens a valve at the bottom of the barrel, and all the water flows down a pipe running down the hill. The pipe ends halfway to the bottom, where the water strikes the paddles of a waterwheel, which turns in response. As the wheel turns, it coils a spring. Which of the following objects contained the greatest total energy?
(A) the water in the barrel at the top of the hill, before it flowed into the pipe  
(B) the coiled spring, right when all the water had flowed from the pipe  
(C) the water moving down the pipe, right when the barrel emptied  
(D) the sandwich, before the woman took her first bite  
(E) the waterwheel, when it first began to coil the spring

Which of the following heating methods involves the most efficient conversion from its naturally occurring form to heat?
(A) whale oil burned in an old-fashioned lantern  
(B) sunlight through the window absorbed by the walls of a room  
(C) heating oil in a house's furnace  
(D) sunlight collected by a solar panel to run an electric heater  
(E) gasoline running a generator that powers an electric heater

The two main elements that compose fossil fuels are
(A) oxygen and hydrogen  
(B) oxygen and carbon  
(C) carbon and hydrogen  
(D) sulfur and carbon  
(E) sulfur and hydrogen
343. Which of the following lists of energy sources is ordered from greatest to smallest percentage of total annual energy usage in the United States?
   (A) nuclear fuels, fossil fuels, geothermal energy
   (B) geothermal energy, nuclear fuels, fossil fuels
   (C) fossil fuels, nuclear fuels, geothermal energy
   (D) fossil fuels, wind, nuclear fuels
   (E) wind, fossil fuels, nuclear fuels

344. Which three of the following are renewable energy sources?
   I. biomass
   II. natural gas
   III. coal
   IV. hydropower
   V. oil
   VI. solar power
   (A) I, II, and VI
   (B) I, IV, and VI
   (C) II, IV, and VI
   (D) II, III, and V
   (E) III, IV, and V

345. All of the following are typically derived from fossil fuels EXCEPT
   (A) geothermal power
   (B) plastics
   (C) organic chemicals
   (D) U.S. electrical power
   (E) automobile fuel

346. Most of the world's oil is located beneath countries in
   (A) South America
   (B) the Far East
   (C) Europe
   (D) the Middle East
   (E) the South Pacific

347. Of oil drilled offshore in U.S. waters, about 90% is recovered from under
   (A) the Gulf of Mexico
   (B) Chesapeake Bay
   (C) the Great Lakes
   (D) the North Atlantic
   (E) the Gulf of Alaska
348. The United States uses about what proportion of world oil production each year?
   (A) 10%
   (B) 25%
   (C) 50%
   (D) 75%
   (E) 90%

349. Compared with the production cost of $7.50 to $10 per barrel of U.S. oil, Saudi Arabian oil is
   (A) less than half as expensive to produce
   (B) between half as expensive and the same cost to produce
   (C) about the same cost to produce
   (D) twice as expensive to produce
   (E) four times as expensive to produce

350. Canada has large deposits—about three-fourths of the world’s supply—of an unconventional oil known as
   (A) bitumen, or tar sands
   (B) shale oil, or kerogen oil
   (C) biomass-based liquid supplies
   (D) coal-based liquid supplies
   (E) natural gas–based liquid supplies

351. Compared with conventional petroleum oil, the amount of carbon dioxide released by burning unconventional oils is
   (A) about one-tenth as large
   (B) about half as large
   (C) about the same
   (D) about twice as large
   (E) four times as large

352. When energy extractors find it underground, “natural gas” is a mixture of gases, but it’s mostly composed of
   (A) butane
   (B) propane
   (C) methane
   (D) ethane
   (E) hydrogen sulfide
353. The one major pollutant released by burning natural gas is
(A) nitrous oxide
(B) hydrogen sulfide
(C) hydrogen cyanide
(D) carbon dioxide
(E) sulfur dioxide

354. Of the following lists of the world’s energy supplies, which begins with the supply that is likely to last longest and ends with the supply that will likely run out soonest?
(A) solar, conventional oil, natural gas
(B) solar, natural gas, conventional oil
(C) coal, solar, conventional oil
(D) conventional oil, natural gas, coal
(E) biomass, conventional oil, natural gas

355. Before it is transported in pipelines or liquefied form, natural gas must be rid of poisonous
(A) nitrogen gas
(B) hydrogen sulfide gas
(C) butane gas
(D) methane gas
(E) ethane gas

356. Unconventional natural gas sources include
(A) oil shale
(B) tar sand
(C) methane hydrate
(D) anthracite
(E) lignite

357. Contour strip mining is a method specialized to extract coal in terrain that is
(A) hilly or mountainous
(B) generally flat
(C) underwater
(D) covered with swamps or marshland
(E) coastal
358. The most abundant fossil fuel is
   (A) unconventional natural gas
   (B) petroleum
   (C) coal
   (D) oil shale
   (E) tar sand

359. The single country with the largest natural gas reserves is
   (A) Qatar
   (B) the United States
   (C) Canada
   (D) Russia
   (E) Iran

360. When burned, which of the following fossil fuels produces the smallest amount of carbon dioxide per unit of energy released?
   (A) gasoline
   (B) coal
   (C) natural gas
   (D) bitumen
   (E) oil shale

361. In the next 10 to 20 years, U.S. natural gas production is expected to increase due to greater exploitation of domestic
   (A) shale deposits
   (B) tar sands
   (C) conventional natural gas deposits
   (D) methane hydrate
   (E) anthracite
362. Transporting natural gas can be expensive for which two of the following reasons?
   I. It requires the building and maintenance of special pipelines.
   II. It must be cooled to a very low temperature to liquefy for shipping.
   III. It must undergo a hydraulic fracturing to prepare it for fuel use.
   IV. It must be purified of radioactive contaminants before it can be transported.
   (A) I and II
   (B) I and III
   (C) II and III
   (D) II and IV
   (E) III and IV

363. Of the following lists of coal types, which one begins with the type having the highest energy content and ends with the type having the lowest energy content?
   (A) lignite, bituminous, anthracite
   (B) bituminous, anthracite, lignite
   (C) anthracite, bituminous, lignite
   (D) lignite, anthracite, bituminous
   (E) anthracite, lignite, bituminous

364. With about 25% of the world’s proven reserves, the country with the largest coal supply is
   (A) Russia
   (B) China
   (C) Bolivia
   (D) the United States
   (E) Australia

365. Fossil fuels typically found beneath a dome formation either on the earth’s surface or under the seafloor include
   I. natural gas
   II. crude oil
   III. coal
   (A) I only
   (B) II only
   (C) III only
   (D) I and II
   (E) II and III
366. The Bog of Allen in Ireland is an ancient lake that gradually began filling with plant matter about 10,000 years ago and is now completely filled. As plant matter accumulated, it was pushed to the bottom of the lake and compressed, eventually undergoing slow chemical reactions that changed it into peat. For thousands of years, people living in the area have burned peat from the bog for fuel, and starting in the 1900s, peat production became an industrialized process. About 90% of the bog is now dry or has been removed for use as fuel. Other ancient wetlands have managed to maintain a thin layer of water for a very long time, allowing peat to accumulate for hundreds of thousands of years, due to gradual sinking of the land or gradual rising of the water level as plant matter accumulates. In these places, sediment occasionally washes over the peat to compress it further, and peat at the bottom of the heap slowly turns into coal. Peat has a carbon content of about 60% when dry, while anthracite coal has a carbon content of about 87%.

(A) Is peat a fossil fuel or a renewable fuel?
(B) How does the carbon content of bituminous coal compare to that of peat and anthracite coal?
(C) Is peat from the Bog of Allen likely to ever become coal?

367. Around the beginning of the 21st century, fossil fuel extraction companies began to discover huge reserves of natural gas trapped in shale deposits. Recently developed improvements in hydraulic fracturing technology have allowed gas extractors to remove the fossil fuel from the ground more efficiently than was previously possible, and in 2009, the Colorado School of Mines' Potential Gas Committee recognized a record increase in U.S. natural gas reserves—about 35% more natural gas had recently become available for extraction due to the recognition of unconventional gas from shale. However, hydraulic fracturing has a growing number of critics, who are concerned that carcinogenic and otherwise dangerous chemicals from fracturing fluid may contaminate underground water supplies, while natural gas may have already leaked into water wells in Dimock, Pennsylvania.

(A) How does hydraulic fracturing help to remove natural gas from shale deposits?
(B) Does unconventional natural gas from shale contribute to global warming more or less than conventional natural gas?
(C) How would hydraulic fracturing fluids or natural gas get from shale gas wells into drinking water? How deep are water wells, compared to the depth at which fracturing fluid is injected into shale deposits?
Nuclear Energy

369. The uranium oxide pellets used in typical nuclear reactors are primarily composed of the nonfissionable isotope
(A) uranium-235
(B) uranium-238
(C) uranium-258
(D) uranium-255
(E) uranium-245

370. Inside a reactor, a neutron strikes a uranium atom nucleus, which splits, releasing a great deal of energy and sending fragments of the nucleus speeding away in different directions. This single sequence of events is best described as an example of
(A) fusion
(B) fission
(C) enrichment
(D) meltdown
(E) beta radiation

371. In addition to cooling a nuclear reactor's core, a fluid known as coolant serves the additional purpose of
(A) transferring heat out of the core for electricity generation
(B) keeping radioactive gases from escaping into the environment
(C) keeping fuel from chemically reacting with the cooling rods
(D) adding neutrons to nonfissionable material to create new nuclear fuel
(E) absorbing neutrons to control the rate of fusion
372. After operating for up to 60 years, conventional nuclear plants must be either renovated or decommissioned for which two main reasons?
   I. Many parts become radioactive.
   II. Spent fuel rods cannot be removed from the core.
   III. Many parts become brittle or corroded.
   IV. Pressure inside the core increases until it reaches the facility’s limit.
   (A) I and II
   (B) II and III
   (C) I and III
   (D) II and IV
   (E) I and IV

373. Fissionable uranium-235 contains a total of 235
   (A) protons
   (B) neutrons
   (C) electrons
   (D) Higgs bosons
   (E) protons and neutrons

374. Of the following lists of radioactive decay products, which is arranged from heaviest to lightest?
   (A) gamma particles, alpha particles, beta particles
   (B) beta particles, alpha particles, gamma particles
   (C) gamma particles, beta particles, alpha particles
   (D) alpha particles, beta particles, gamma particles
   (E) alpha particles, gamma particles, beta particles

375. Whether or not an atom’s nucleus is unstable depends mostly on its number of
   (A) protons
   (B) electrons
   (C) neutrons
   (D) quarks
   (E) pi orbitals

376. The half-life of element X is 40 years. Starting from a mass of 50 grams, how much element X will have undergone radioactive decay in 120 years?
   (A) 50 grams
   (B) 43.75 grams
   (C) 25 grams
   (D) 12.5 grams
   (E) 6.25 grams
377. Radioactive materials are dangerous to organisms such as humans because
(A) they neutralize the electrical charges of biological molecules, rendering them inert
(B) cells will substitute radioactive elements for oxygen and suffocate
(C) they cause proteins to replicate themselves uncontrollably
(D) they release particles that ionize biological molecules, splitting them
(E) they absorb crucial electrolytes, shutting down ion transfer across cell membranes

378. A nuclear reactor that makes more fissionable fuel is specifically known as a
(A) fusion reactor
(B) tokamak reactor
(C) moderator reactor
(D) breeder reactor
(E) light-water reactor

379. When spent nuclear fuel rods are stored temporarily at a nuclear reactor, they are often put into pools of boron-treated water to prevent them from
(A) undergoing an uncontrollable chain reaction resulting in a nuclear explosion
(B) turning to difficult-to-manage radioactive dust after further decay
(C) spreading throughout the facility as they melt into liquid form
(D) heating up, catching fire, and releasing contaminants into the environment
(E) combining with nitrogen in the air to become a high-pressure radioactive gas

380. The open nuclear fuel cycle does NOT involve
(A) reprocessing spent fuel into usable fissionable material
(B) burying radioactive wastes underground for thousands of years
(C) mining uranium-containing ore from the earth
(D) decommissioning old reactors
(E) temporarily storing spent fuel in dry casks or pools of water

381. To safeguard the environment and people living in it, high-level radioactive waste from fission reactors must be stored for
(A) 1 to 10 years
(B) 50 to 5,000 years
(C) 10,000 to 250,000 years
(D) 1 million to 10 million years
(E) 500 million to 1 billion years
382. What proportion of the United States' high-level radioactive waste is stored in long-term underground facilities?
   (A) all of it
   (B) 75%
   (C) 50%
   (D) 25%
   (E) none of it

383. Transuranium elements can be obtained only by
   (A) mining deposits located deep under the ocean
   (B) refining petroleum using high-pressure processes
   (C) bombarding heavy elements with neutrons
   (D) treating uranium ores with corrosive chemicals
   (E) gathering and refining uranium decay products

384. Which of the following is NOT a drawback of nuclear energy?
   (A) highly dangerous waste products
   (B) potential for catastrophic plant accident
   (C) cannot compete economically without government subsidies
   (D) high air pollution from normal operations
   (E) plants and waste storage facilities seen as terrorist targets

385. Which three of the following are components of the open nuclear fuel cycle?
   I. decommissioning of old power plants
   II. mining uranium ore
   III. generating electricity with a steam-driven turbine
   IV. reprocessing of radioactive waste into fuel
   V. pumping of coolant through the core
   VI. temporary storage of high-level radioactive waste
   (A) I, II, and III
   (B) I, II, and VI
   (C) II, III, and IV
   (D) III, IV, and V
   (E) II, IV, and VI

386. Most of the world's nuclear reactors and all of the United States' nuclear reactors are
   (A) light-water reactors
   (B) fusion reactors
   (C) pebble-bed modular reactors
   (D) high-temperature gas-cooled reactors
   (E) breeder reactors
387. In the United States, the government agency currently charged with overseeing the safety and licensing of nuclear reactors and their fuel is known as the
(A) U.S. Nuclear Regulatory Commission
(B) U.S. Atomic Energy Commission
(C) U.S. Union of Concerned Scientists
(D) U.S. Energy Research and Development Administration
(E) U.S. National Nuclear Security Administration

388. The 1986 Chernobyl nuclear power plant accident occurred in what modern day country?
(A) Russia
(B) Ukraine
(C) Lithuania
(D) France
(E) Belarus

389. Coal compares favorably to nuclear energy in few areas, including
(A) land disruption due to mining
(B) air pollution
(C) contribution to acid rain
(D) difficulty of plant construction and maintenance
(E) contribution to global warming

390. Among the following U.S. regions, which has the highest concentration of nuclear power plants?
(A) Mountain West
(B) Southwest
(C) Midwest
(D) Gulf Coast
(E) Pacific Coast

391. The planned Yucca Mountain long-term, underground storage facility for high-level radioactive waste is located in the state of
(A) Wyoming
(B) Nevada
(C) Utah
(D) Idaho
(E) Colorado
392. In order for uranium ore to be enriched for use as nuclear power plant fuel, it is first chemically converted to
(A) uranium hexafluoride
(B) uranium hexachloride
(C) uranium hexabromide
(D) plutonium-239
(E) uranium hexaiodide

393. Pure uranium ore, or “yellowcake,” is composed of the element uranium chemically bonded to the element
(A) fluorine
(B) chlorine
(C) oxygen
(D) boron
(E) hydrogen

394. Of the following power plant components, which one is found ONLY in nuclear power plants?
(A) turbine
(B) cooling tower
(C) control rod
(D) condenser
(E) water pump

395. In the closed nuclear fuel cycle, decommissioned reactors are
(A) processed into fissionable fuel
(B) reused in the construction of new power plants
(C) simply discarded in a landfill, since they are not radioactive
(D) buried or otherwise disposed of safely, since they are radioactive
(E) reduced to ash through incineration

396. After the 2011 earthquake and tsunami that devastated some of Japan’s east coast, the Fukushima Daiichi power plant experienced an uncontrolled fission reaction when coolant stopped circulating around fuel rods, and emergency control measures did not adequately halt the process. Thus, the plant experienced a partial
(A) enrichment
(B) meltdown
(C) conversion
(D) fission explosion
(E) nuclear fusion reaction
Chapter 13

Alternative and Renewable Energies

402. Of the following energy sources, which one is a “secondary source” that must be produced by humans using another energy source that may be nonrenewable?
(A) solar
(B) hydrogen
(C) biomass
(D) geothermal
(E) wind

403. Dams that allow water to flow through at a controlled rate can generate electricity if the water turns a turbine on its way out. This kind of power plant produces
(A) dam power
(B) geothermal power
(C) kinetic power
(D) tidal power
(E) hydroelectric power

404. Which of the following is often a disadvantage of damming rivers to generate electricity?
(A) low-efficiency conversion of water kinetic energy to electricity
(B) short power-plant life, requiring frequent decommissioning
(C) negative environmental impact from flooding behind a dam and decreased fertilizer flow through a whole river
(D) high carbon dioxide emissions from electricity-generating equipment
(E) water behind a dam not suitable for agricultural purposes
405. Wafers of layered semiconductor sheets that produce electrical current when exposed to light are technically known as
(A) photovoltaic cells
(B) thermal cells
(C) visible spectrum cells
(D) passive solar cells
(E) semiconductor cells

406. The Staebler-Wronski effect describes
(A) the drop in efficiency of certain silicon solar cells exposed to intense light
(B) an increase in solar-cell efficiency related to lower operating temperatures
(C) the decrease in efficiency of wind turbines in winds faster than 25 kilometers per hour
(D) the backward flow of electrical current in solar cells lacking any light
(E) the loss of some energy in the form of waste heat as energy is converted from one form to another

407. Which two of the following alternative energy sources do NOT ultimately depend on energy from the sun?
I. wind
II. dammed rivers
III. dammed ocean coves (tidal)
IV. biomass
V. geothermal heat
(A) I and II
(B) II and III
(C) III and IV
(D) III and V
(E) IV and V

408. One of the main problems with switching to ethanol as a fuel in the United States is that
(A) it takes a great deal of energy to produce ethanol from corn, the major crop used in its production
(B) automobile engines have not yet been developed to use ethanol
(C) ethanol cannot be made in a renewable way
(D) burning ethanol releases large amounts of sulfur into the atmosphere
(E) producing ethanol requires the use of highly toxic chemicals
409. Of the following alternative energy sources, which has the highest energy return on energy invested?
   (A) photovoltaic solar
   (B) hydroelectric
   (C) geothermal
   (D) biodiesel
   (E) wind

410. Possible alternative automobile fuels include all of the following EXCEPT
   (A) hydrogen
   (B) ethanol
   (C) biomass
   (D) biodiesel
   (E) methanol

411. In the United States, mass production of which of the following alternative energy sources could cause an increase in food prices?
   (A) geothermal
   (B) wind
   (C) ethanol
   (D) solar
   (E) hydroelectric

412. Proposed methods for using geothermal energy include
   (A) running turbines directly with hot gases expelled through volcanic vents
   (B) channeling molten magma from live volcanoes to power plants to run steam turbines
   (C) capturing hydrogen sulfide gas for use as a flammable fuel
   (D) heating a home's water by piping it underground and back
   (E) using the magnetic fields produced by churning magma in the mantle to create electricity by induction

413. Wind turbines can produce more power when they
   (A) generate direct current rather than alternating current
   (B) are constructed with longer blades
   (C) are mounted higher off the ground
   (D) have five or more blades each
   (E) include small electric motors to aid spinning
All of the following are examples of wind power's disadvantages EXCEPT

(A) wind power can be inconsistent
(B) wind farms require a large amount of space
(C) wind turbines make noise
(D) wind turbines generate direct current that must be converted to alternating current
(E) wind turbines can kill birds in flight

Which three of the following energy sources are NOT necessarily sustainable?
I. wind
II. biomass
III. hydrogen
IV. solar
V. geothermal
VI. ethanol
(A) I, II, and III
(B) II, III, and VI
(C) III, IV, and V
(D) III, V, and VI
(E) IV, V, and VI

While methanol and ethanol are very similar, the major structural difference between the two chemicals is that
(A) methanol has a phosphorus backbone, while ethanol has a carbon backbone
(B) methanol has one carbon atom surrounded by hydrogen, while ethanol has two
(C) methanol has one hydroxyl (-OH) group, while ethanol has two
(D) methanol is not an alcohol, while ethanol is
(E) methanol has two carbon atoms surrounded by hydrogen, while ethanol has one

A hydroelectric facility that takes in only some of a river's water—rather than damming the entire river—is known as
(A) an impoundment plant
(B) a diversion plant (run of river)
(C) a pumped storage plant
(D) an irrigation and generation plant
(E) a micro hydropower plant
418. Which two of the following alternative energy sources do NOT require the use of a turbine to create electricity?
   I. solar
   II. wind
   III. geothermal
   IV. hydropower
   V. ethanol

   (A) I and II
   (B) I and V
   (C) II and III
   (D) II and IV
   (E) III and V

419. Burning hydrogen releases energy in the form of heat and

   (A) carbon dioxide
   (B) hydrogen sulfide
   (C) water
   (D) oxygen gas
   (E) hydrogen peroxide

420. Burning pure ethanol releases mainly

   (A) carbon dioxide and water
   (B) oxygen and hydrogen gases
   (C) carbon monoxide and nitrous oxide
   (D) hydrogen sulfide and hydrogen peroxide
   (E) sulfur dioxide and diethyl ether

421. Processing biomass with bacteria can produce which three of the following fuels?
   I. methane
   II. methanol
   III. ethanol
   IV. hydrogen
   V. butane
   VI. charcoal

   (A) I, II, and III
   (B) I, III, and IV
   (C) II, III, and IV
   (D) II, IV, and V
   (E) III, IV, and VI
422. Two countries together produce and consume the majority of the world’s ethanol fuel. They are
   (A) Russia and Nigeria  
   (B) Canada and the Netherlands  
   (C) Iceland and New Zealand  
   (D) Argentina and China  
   (E) the United States and Brazil

423. Which of the following is the LEAST efficient way to use energy stored in biomass?
   (A) directly burning it to produce heat in an open fire  
   (B) converting it to wood gas to burn for heat  
   (C) converting it to ethanol for use as an automobile fuel  
   (D) burning it to run a steam turbine for electricity to make hydrogen from water for automobile fuel  
   (E) using it in bacterial processors to make methane for use in a steam turbine–based electricity-generating plant

424. When ethanol is used as a fuel in the United States, it is mostly in the form of
   (A) a pure liquid for use in special automobiles  
   (B) a pressurized gas that is usually burned for its heat  
   (C) a liquid mixed with gasoline for use in ordinary automobiles  
   (D) a pressurized gas that is used only in specially outfitted automobiles  
   (E) a solid “brick” that is usually burned for its heat

425. Compared to ordinary gasoline, one disadvantage of ethanol is its
   (A) higher carbon dioxide emissions  
   (B) lower fuel efficiency per unit volume  
   (C) higher carbon monoxide emissions  
   (D) lower torque (rotational force) output  
   (E) higher sulfur emissions

426. Of the following materials, which CANNOT be used as a biomass fuel?
   (A) charcoal  
   (B) granite  
   (C) animal dung  
   (D) cardboard  
   (E) tree bark
427. Of the following countries' capital cities, which one uses geothermal heat to warm the great majority of its buildings?
(A) Washington, D.C.
(B) Wellington, New Zealand
(C) Reykjavik, Iceland
(D) Moscow, Russia
(E) Kiev, Ukraine

428. One disadvantage to tapping dry- or wet-steam geothermal resources is that
(A) drilling that deeply runs the risk of provoking a volcanic eruption
(B) it is possible to deplete the heat in some underground reservoirs for a period of time
(C) releasing underground pressure can cause the overlying ground to sink, cracking buildings and streets
(D) drilling too close to a geologically active fault can increase the frequency of earthquakes
(E) water from deep in the earth's crust is highly corrosive to metal pipes and machines, making maintenance very expensive

429. Most U.S. states require electric utilities to provide a certain share of electricity from renewable sources. They meet this goal by buying certificates from suppliers of electricity from sustainable sources. These certificates represent 1,000 kilowatt-hours of electricity, and they are called
(A) sustainable electricity certificates, or green cererts
(B) renewable energy certificates, or green tags
(C) replenishable source certificates, or green credentials
(D) environmentaly sound certificates, or green records
(E) inexhaustible supply certificates, or green papers

430. Which of the following has NOT been proposed as a method for storing hydrogen fuel?
(A) cooling it to liquid form
(B) compressing it as a gas
(C) absorbing it with metal hydride compounds
(D) absorbing it in activated charcoal
(E) cooling it to solid form
431. By far the largest alternative energy source by total energy production worldwide is
(A) hydropower
(B) wind
(C) biomass
(D) geothermal
(E) solar

432. Taking advantage of its sunny weather, Spain is investing heavily in solar power. One project is the PS10 solar power plant near Seville, the first "commercial concentrating solar power tower" in the world. PS10 generates 11 megawatts of electricity using 624 swiveling mirrors—each 120 square meters—to reflect sunlight onto a collector at the top of a 115-meter tower, where it heats water to run a steam-driven turbine. In 2011 dollars, the plant cost about $50 million to build, and it’s part of a larger, 300-megawatt complex that is expected to cost a total of about $1.7 billion. At about $5.67 per megawatt, the Spanish solar power complex is more expensive than the estimated $4-per-megawatt construction cost that Alliant Energy estimated for a new coal-based power plant near Portage, Wisconsin, in 2008. The Wisconsin project’s original estimated price tag was about $2.83 per megawatt, but construction costs rose sharply thereafter. The 2007 price of electricity from PS10 was about three times that of electricity from other sources.
(A) What type of solar power does the PS10 plant use to generate electricity?
(B) Which aspects of the operation of PS10 have cost advantages over a coal-fired power plant?
(C) What environmental advantages might PS10 have over a coal-fired plant?

433. When Hoover Dam opened in 1936, it was the largest concrete structure in the world. Beginning in 1931, thousands of workers contributed to the project—more than 5,200 were working when the project was at its employment peak. Located at the border of Nevada and Arizona, Hoover Dam generates 2,080 megawatts for utilities in those two states and California. It’s the single reason for the existence of the Lake Mead reservoir, which lies immediately upstream, and it controls flooding of the Colorado River below it.
(A) What sort of hydroelectric power plant is Hoover Dam? What is its power classification?
(B) Would electricity from Hoover Dam be fairly represented as renewable energy?
(C) What are Hoover Dam’s negative environmental effects?