Biology 112 – Introduction to Ecology

NAPA VALLEY COLLEGE

Session: Spring 2011
Section: 51569   3 Units
Class Location: NVC 838
Days / Time: W 6:00 PM – 8:50 PM
Instructor: RIDDELL

Practice Midterm Exam

Raven, Berg, Hassenzahl: Environment, 7th Edition
Chapter 07: Human Health and Environmental Toxicology

1. Which of the following action(s) may unintentionally contribute to outbreaks of infectious disease?
   a)   global travel
   b)   social factors
   c)   disruption of natural environments
   d)   crowding of people in cities
   e)   all of these

   Ans: e
   Difficulty: Easy
   Response:
   Human Health; Entire Section; 7.1

2. The body mass index (BMI) is used to determine the health status of your weight for a person of your height. Imagine you have a BMI of 35.7. Doctors would diagnose you as:
   a)   malnourished
   b)   underweight
   c)   healthy weight
   d)   overweight
   e)   obese

   Ans: e
   Difficulty: Easy
   Response:
   Health Issues in Highly Developed Countries; 7.1.1

3. Acute toxicity:
   a)   is only caused by synthetic chemicals
   b)   is poorly understood by toxicologists
   c)   may mimic symptoms of chronic diseases
   d)   produces an effect within a short period of a single exposure
   e)   always results in death

   Ans: d
   Difficulty: Easy
   Response:
   Determining Health Effects of Environmental Pollution 7.3

4. Endocrine disrupters:
   a)   do not include DDT
   b)   only affect the reproductive capability of females
   c)   affect the reproduction of fishes, birds, reptiles and mammals
   d)   only affect the reproduction of humans
   e)   are still often used in the US

   Ans: c
   Difficulty: Easy
   Response:
   Endocrine Disrupters; 7.2.2

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5. Pollutants that interfere with the normal functioning of hormones are called:
   a)   radioisotopes
   b)   synergists
   c)   stimulants
   d)   endocrine disrupters
   e)   carcinogens

   Ans: d
   Difficulty: Easy
   Response:
   Endocrine Disrupters; 7.2.2

6. The _____ and _____ were amended in response to the need to test chemicals for their potential to disrupt the endocrine system.
   a)   Endangered Species Act and Fishery Act
   b)   Food Quality Protection Act and Safe Drinking Water Act
   c)   2002 Conservation Act and 2005 Management Act
   d)   Assessment of Risk Act and Human Protection Act
   e)   Food and Drug Administration Act and Environmental Protection Act

   Ans: b
   Difficulty: Easy
   Response:
   Endocrine Disrupters; 7.2.2

7. The large number of children being driven to school rather than walking has led to which of the following:
   a)   increased fossil fuel burning by vehicles
   b)   a decrease in the child's exercise
   c)   reduced interaction of children with their environment
   d)   increased risk of childhood obesity
   e)   all of these

   Ans: e
   Difficulty: Easy
   Response:
   Chapter Opener; 7.0

8. All of the following are true of red tides except:
   a)   they are caused by certain species of harmful algae that grow in large concentrations
   b)   they frequently cause the water to appear orange red or brown
   c)   they produce toxins that attack the nervous systems of various sea life
   d)   they are often observed in association with phases of the moon
   e)   no one knows what triggers them

   Ans: d
   Difficulty: Easy
   Response:
   Case In Point: The Ocean and Human Health; 7.4.1

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9. The three leading causes of death in the United States today are cardiovascular disease, chronic obstructive pulmonary disease and:
   a)   pneumonia
   b)   cancer
   c)   influenza
   d)   tuberculosis
   e)   diarrhea

   Ans: b
   Difficulty: Easy
   Response:
   Health Issues in Highly Developed Countries; 7.1.1

10. What has prevented polio from becoming eradicated on a global basis?
    a)   knowledge of what causes polio
    b)   the development of an effective polio vaccine
    c)   public fear and suspicion of the safety of the polio vaccine
    d)   availability of the polio vaccine to developing countries
    e)   global suspension of the polio vaccine

    Ans: c
    Difficulty: Easy
    Response:
    Health Issues in Developing Countries; 7.1.2

11. Two indicators of human health in a given country are:
    a)   BMI and life expectancy
    b)   mortality rate and BMI
    c)   emerging diseases vs. reemerging diseases
    d)   health care and mortality rate
    e)   infant mortality and life expectancy

    Ans: e
    Difficulty: Easy
    Response:
    Health Issues in Highly Developed Countries; 7.1.1

12. Emerging diseases are:
    a)   infectious diseases that were not previously found in humans and typically jump from an animal host to humans
    b)   infectious diseases that existed in the past but for a variety of reasons are increasing in incidence
    c)   infectious diseases that were previously found in humans and typically jump from a human host to animals
    d)   non-infectious diseases that have transformed into infectious diseases
    e)   hidden diseases that are finally being detected through technology

    Ans: a
    Difficulty: Easy
    Response:
    Emerging and Reemerging Diseases; 7.1.3

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13. A dose that is represented as LD50 is a dose that:
   a)   is administered to 50% of the population
   b)   causes 50% of a population to exhibit whatever response is under study
   c)   has a threshold response of 50%
   d)   kills half of the population of test animals
   e)   has an acceptable risk level of 50%

   Ans: d
   Difficulty: Easy
   Response:
   Determining Health Effects of Environmental Pollution; 7.3

14. A lethal dose of a toxicant may vary depending on all of the following except:
   a)   organisms age
   b)   organisms geographic location
   c)   organisms sex
   d)   organisms metabolism
   e)   organisms genetic makeup

   Ans: b
   Difficulty: Easy
   Response:
   Determining Health Effects of Environmental Pollution; Entire Section; 7.3

15. The National Institute of Environmental Health Science has identified several hundred environmental susceptibility genes. These genes:
   a)   affect how the body metabolizes toxicants, making toxicants more or less toxic
   b)   provide complete protection from environmental pollution
   c)   allow adults to produce enzymes necessary to eat unprocessed food with no ill effects
   d)   cause weaknesses in the immune system
   e)   influence a person's preference for outdoor activities

   Ans: a
   Difficulty: Easy
   Response:
   Determining Health Effects of Environmental Pollution; 7.3

16. The study of contaminants in the biosphere, including their harmful effects on ecosystems is termed:
   a)   Agrobiology
   b)   Physiology
   c)   Ecotoxicology
   d)   Archaeology
   e)   Cytology

   Ans: c
   Difficulty: Easy
   Response:
   Ecotoxicology: Toxicant Effects on Communities and Ecosystems; 7.4

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Practice Midterm Exam

17. A carcinogen is a:
    a)   type of microorganism associated with human sewage
    b)   cancer-causing chemical, radiation, or virus
    c)   vehicle that requires no gasoline to operate
    d)   phytochemical (a protective plant compound that promotes health)
    e)   computer chip

    Ans: b
    Difficulty: Easy
    Response:
    Identifying Cancer-Causing Substances; 7.3.3

18. Chemicals that are not readily broken down into less toxic forms are said to exhibit:
    a)   persistence
    b)   bioaccumulation
    c)   biological magnification
    d)   genetic resistance
    e)   short-term effects

    Ans: a
    Difficulty: Easy
    Response:
    Persistence, Bioaccumulation and Biological Magnification of Environmental Contaminants;
    7.2.1

19. The build up of pesticides in an organism's body is termed:
    a)   persistence
    b)   bioaccumulation
    c)   biological magnification
    d)   biological amplification
    e)   the pesticide treadmill

    Ans: b
    Difficulty: Easy
    Response:
    Persistence, Bioaccumulation and Biological Magnification of Environmental Contaminants;
    7.2.1

20. When a chemical mixture has a greater combined effect then expected, it is a _____
    chemical mixture?
    a)   synergistic
    b)   additive
    c)   compounding
    d)   unrealistic
    e)   antagonistic

    Ans: a
    Difficulty: Easy
    Response:
    Chemical Mixtures; 7.3.4

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Practice Midterm Exam

21. An antagonistic interaction in a chemical mixture results in:
    a)   the expected effect given
    b)   a greater combined effect than expected
    c)   a smaller combined effect than expected given
    d)   no chemical reaction
    e)   variable results depending on the chemicals present

    Ans: c
    Difficulty: Easy
    Response:
    Chemical Mixtures; 7.3.4

22. Cancer potency is:
    1) an estimate of the expected increase in cancer associated with a unit increase in exposure to a chemical
    2) an estimate of the expected increase in cancer associated with a unit decrease in exposure to a chemical
    3) an estimate of the expected decrease in cancer associated with a unit decrease in exposure to a chemical
    4) an estimate of the expected decrease in cancer associated with a unit increase in exposure to a chemical
    a)   1
    b)   2
    c)   3
    d)   4
    e)   Both 1 and 3

    Ans: a
    Difficulty: Easy
    Response:
    Decision Making and Uncertainty: Assessment of Risks; 7.5

23. Cost-benefit analysis:
    1) helps decision makers formulate environmental legislation
    2) balances estimated costs with potential environmental benefits
    3) is never used in issues involving human health and safety
    4) is really only applicable in the field of economics
    a)   1
    b)   2
    c)   3
    d)   4
    e)   1 and 2

    Ans: e
    Difficulty: Easy
    Response:
    Cost-Benefit Analysis of Risks; 7.5.1

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24. If you measured the LD50 for a particular chemical, you would know:
    a)   that the chemical is safe for human use
    b)   how much it takes to kill 50 rats
    c)   what dose is lethal to 50% of a population of test animals
    d)   the chemical properties of the given chemical
    e)   the effective dose for humans

    Ans: c
    Difficulty: Easy
    Response:
    Determining Health Effects of Environmental Pollution; 7.3

25. All of the following are true statements about nanotechnology except:
    a)   It enables glass to be produces that is heat-resistant up to 1,000° C
    b)   The burden of proof about product safety will fall on the EPA
    c)   It can assist doctors in identifying cancer cells
    d)   The FDA will have to oversee regulation of nanotechnology with potential health and safety risks
    e)   It includes devices designed on the scale of individual atoms

    Ans: b
    Difficulty: Easy
    Response:
    Endocrine Disruptors; 7.2.2

26. For the time being, the FDA has approved the use of Bisphenol A (BPA) as safe because:
    1) studies have yet to show that it is an endocrine disrupter
    2) it is unclear how much of it is taken up by our bodies
    3) it rarely comes into contact with products for human consumption
    4) the low concentrations present in bottles may not have a negative effect
    a)   1
    b)   2
    c)   3
    d)   4
    e)   2 and 4

    Ans: e
    Difficulty: Medium
    Response:
    Endocrine Disrupters; 7.2.2

27. Which of the following is an endocrine disrupter?
    a)   CFCs
    b)   mercury
    c)   ozone
    d)   carbon dioxide
    e)   acid rain

    Ans: b
    Difficulty: Medium
    Response:
    Endocrine Disrupters; 7.2.2

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Practice Midterm Exam

28. Which of the following is not a leading cause of death in children of developing countries?
    a)   malaria
    b)   malnourishment
    c)   lower respiratory tract infections
    d)   diarrheal diseases
    e)   all of these are leading causes of death in children of developing countries

    Ans: e
    Difficulty: Medium
    Response:
    Health Issues in Developing Countries; 7.1.2

29. The factors that account for the differences in health and health care between highly developed and developing nations include all of the following except:
    a)   access to immunization services for children
    b)   adequate nutrition for normal growth and development
    c)   average number of children a mother has
    d)   average life expectancy
    e)   money available for health care

    Ans: d
    Difficulty: Medium
    Response:
    Human Health; 7.1

30. All of the following are main factors involved in emergence or reemergence of infectious disease *except*:
    a)   a growing population of elderly people who are more susceptible to infection
    b)   urbanization, associated with overcrowding and poor sanitation
    c)   the depletion of antibiotics
    d)   growth in international travel and commerce
    e)   all of these are factors in emergence of infectious disease

    Ans: c
    Difficulty: Medium
    Response:
    Emerging and Reemerging Diseases; 7.1.3

31. Which of the following statements is false?
    a)   A dose-response curve shows the effect of different doses on a population.
    b)   Doses lower than the threshold level will have no measurable effect on organisms.
    c)   The smaller the LD50, the more toxic the chemical.
    d)   A dose-response curve is a graph illustrating the inverse relationship between LD50 and the acute toxicity of a chemical.
    e)   The threshold level for a dose-response is the minimum dose with a measurable effect.

    Ans: d
    Difficulty: Medium
    Response:
    Determining Health Effects of Environmental Pollution; 7.3

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32. Which of the following associations between children, adults, and pesticides is correct?
   a) children are more susceptible to pesticides because they weigh substantially less than adults
   b) lethal doses of pesticides are larger for children than for adults
   c) children are more sensitive to pesticides than adults because adults have built up immunity to the pesticide chemicals
   d) children have more stringent pesticide regulations to protect their health than do adults
   e) pesticides commonly affect development of height and reproductive organs in young children but commonly cause brain cancer and leukemia in adults

   Ans: a
   Difficulty: Medium
   Response:
   Children and Chemical Exposure; 7.3.2

33. DDT was sprayed in a Long Island salt marsh over a period of years for mosquito control. A portion of the food web is as follows:
   Algae -> shrimp-> American eel -> Atlantic needlefish -> ring-billed gull
   In which organism would biological magnification be greatest?
   a) Algae
   b) shrimp
   c) American eel
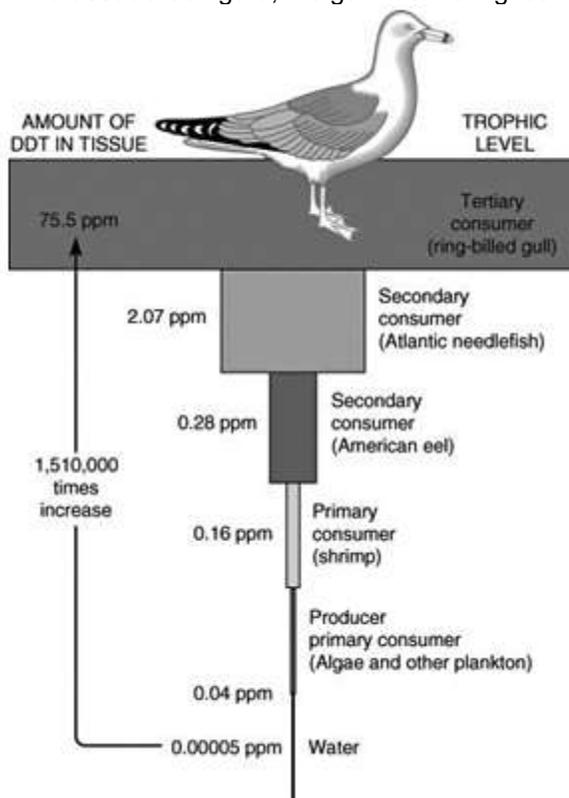   d) Atlantic needlefish
   e) ring-billed gull

   Ans: e
   Difficulty: Medium
   Response:
   Persistence, Bioaccumulation and Biological Magnification of Environmental Contaminants; 7.2.1

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34. In the associated figure, the gull has the highest concentration of DDT because it is:

AMOUNT OF DDT IN TISSUE

TROPHIC LEVEL

75.5 ppm — Tertiary consumer (ring-billed gull)

2.07 ppm — Secondary consumer (Atlantic needlefish)

0.28 ppm — Secondary consumer (American eel)

1,510,000 times increase

0.16 ppm — Primary consumer (shrimp)

Producer primary consumer (Algae and other plankton)

0.04 ppm

0.00005 ppm — Water

a)   a more complex organism
b)   an older organism
c)   at the bottom of the food chain
d)   at the top of the food chain
e)   homoeothermic (warm-blooded)

Ans: d
Difficulty: Medium
Response:
Persistence, Bioaccumulation and Biological Magnification of Environmental Contaminants;
7.2.1

Practice Midterm Exam

35. Given the data in the accompanying table, which of the chemicals is the most toxic

Chemical	$LD_{50 \ (mg/kg)}$ administered orally to rats
Strychnine	1.7
Cocaine	17.5
Heroin	150.0
Caffeine	200.0
Morphine	500.0

a)   strychnine
b)   cocaine
c)   heroin
d)   caffeine
e)   morphine

Ans: a
Difficulty: Medium
Response:
 Determining Health Effects of Environmental Pollution; 7.3

36. A "dose-response curve" shows:
a)   the dose of a given chemical that is lethal to 50% of the population
b)   the dose of a given chemical that causes 50% of a population to exhibit a response
c)   the correct dose to use in the treatment of illness
d)   the dose that will be harmful to the environment
e)   the effect of different doses on a population of test organisms

Ans: e
Difficulty: Easy
Response:
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Practice Midterm Exam

37. Examine the graph and choose the letter that corresponds to the threshold level
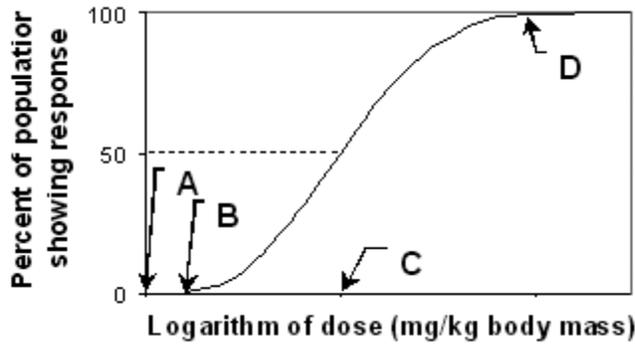
a)   point A on graph
b)   point B on graph
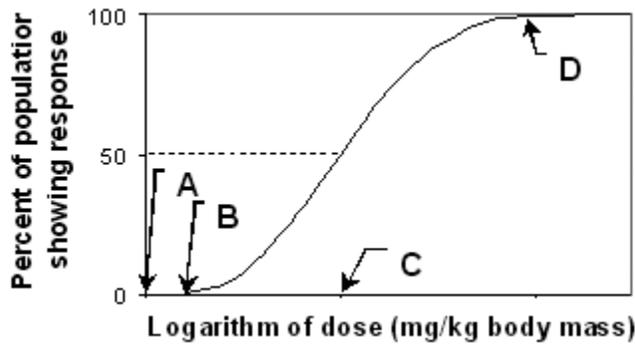c)   point C on graph
d)   point D on graph
e)   none of these

Ans: b
Difficulty: Medium
Response:
Determining Health Effects of Environmental Pollution; 7.3

38. Examine the associated graph and choose the letter that corresponds to the ED50.

a)   point A on graph
b)   point B on graph
c)   point C on graph
d)   point D on graph
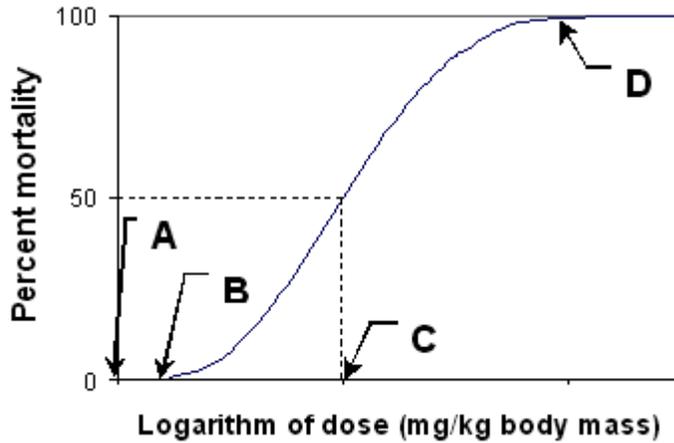e)   none of these

Ans: c
Difficulty: Medium
Response:
Determining Health Effects of Environmental Pollution; 7.3

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39. Examine the graph and choose the letter that corresponds to the LD50.

a)   point A on graph
b)   point B on graph
c)   point C on graph
d)   point D on graph
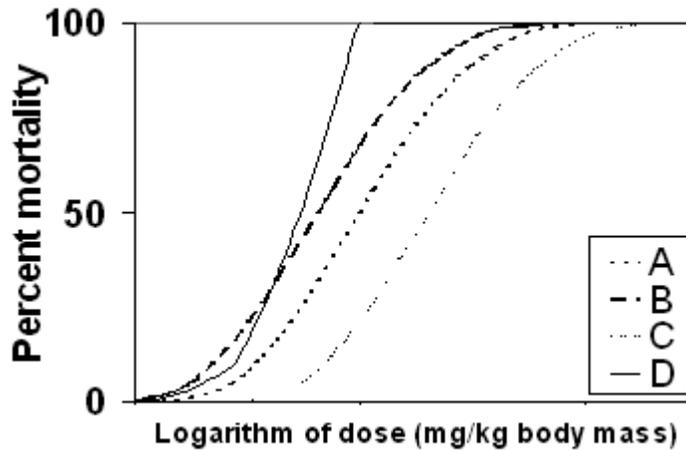e)   none of these

Ans: e
Difficulty: Medium
Response:
Determining Health Effects of Environmental Pollution; 7.3

40. Examine the graph and determine which chemical is the most toxic. Choose the correct letter.

a)   curve A
b)   curve B
c)   curve C
d)   curve D
e)   answer cannot be determined using this graph

Ans: d
Difficulty: Medium
Response:
Determining Health Effects of Environmental Pollution; Opener; 7.3

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41. The study of organisms in the biosphere, including their harmful effects on ecosystems is known as:
    a)   environmental toxicology
    b)   ecotoxicology
    c)   biotoxicology
    d)   epidemiology
    e)   both environmental toxicology and ecotoxicology

    Ans: e
    Difficulty: Easy
    Response:
    Ecotoxicology: Toxicant Effects on Communities and Ecosystems; 7.4

42. Which of the following statements about carcinogens is false?
    a)   Cancer was traditionally the only disease evaluated in the chemical risk assessment of environmental contaminants.
    b)   Rats and mice often respond differently to the same toxicant.
    c)   It is assumed that one can extrapolate from doses and cancer rates in rats to determine human cancer rates.
    d)   The body often handles very small doses of carcinogens the same way as large doses.
    e)   Children and pregnant women may tolerate carcinogens differently than a healthy young male.

    Ans: d
    Difficulty: Medium
    Response:
    Identifying Cancer-Causing Substances; 7.3.3

43. Risk analysis is a tool used to organize how we think about complex environmental systems. When we think about risk from a systems perspective we can decide whether it's most effective to:
    a)   change out activities to avoid particular risks
    b)   limit the extent to which the hazard can come in to contact wit us
    c)   limit the extent to which the hazard can harm us
    d)   provide some sort of offset or compensation for being harmed by the hazard
    e)   all of these

    Ans: e
    Difficulty: Medium
    Response:
    Decision Making and Uncertainty: Assessment of Risks; 7.5

44. Risk assessment involves all of the following except:
    a)   financial costs of the predicted risk
    b)   identification of the hazard
    c)   dose-response assessment
    d)   assessment of the exposure
    e)   characterization of the risk

    Ans: a
    Difficulty: Easy
    Response:
    Decision Making and Uncertainty: Assessment of Risks; 7.5

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45. What environmental catastrophe was largely responsible for replacement of the dilution paradigm by the boomerang paradigm?
   a)   the effect of the 1989 Exxon Valdez oil spill in Alaska on birds
   b)   the effect of the 1980 chemical spill in Lake Apopka on alligators
   c)   an increase in surface temperatures in the Bay of Bengal increasing risk of cholera
   d)   the accumulation of the pesticide DDT in birds at the top of the food web
   e)   massive wildfires destroying habitat of endangered species

   Ans: d
   Difficulty: Medium
   Response:
   Ecotoxicology: Toxicant Effects on Communities and Ecosystems; 7.4

46. The infant mortality rate in a developing country is most likely to be:
   a)   the same as in a highly developed country
   b)   lower than in a highly developed country
   c)   higher than in a highly developed country
   d)   unrelated to life expectancy in a developing country
   e)   impossible to determine

   Ans: c
   Difficulty: Easy
   Response:
   Human Health; 7.1

47. "The solution to pollution is dilution" was a generally accepted pattern of the past. Today virtually all environmental scientists have rejected the dilution paradigm in favor of:
   a)   the "now you see it, now you don't" paradigm: what you throw away, stays away
   b)   the boomerang paradigm: what you throw away can come back and hurt you
   c)   the chemical paradigm: all chemicals that are thrown away transform naturally into biodegradable elements
   d)   the awareness paradigm: there is no connection between pollution and health to cause concern
   e)   the marine paradigm: what you throw away down the storm drain goes to the ocean, the best receptacle for pollution

   Ans: b
   Difficulty: Medium
   Response:
   Ecotoxicology: Toxicant Effects on Communities and Ecosystems; 7.4

48. Environmental contaminants are linked to all of the following serious diseases except:
   a)   cancer
   b)   birth defects
   c)   reproductive problems
   d)   malaria
   e)   damage to the nervous system

   Ans: d
   Difficulty: Medium
   Response:
   Determining Health Effects of Environmental Pollution; Entire Section; 7.3

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Practice Midterm Exam

49. If a chemical with a toxicity level of 1 is mixed with a different chemical with a toxicity level of 1, the combined effect of exposure to the mixture is 2. This is an example of:
a)   Chemical mixtures interacting by amplification
b)   Chemical mixtures interacting by antagonism
c)   Chemical mixtures interacting by squaring
d)   Chemical mixtures interacting by synergy
e)   Chemical mixtures interacting by additivity

Ans: e
Difficulty: Medium
Response:
Chemical Mixtures; 7.3.4

50. "An ounce of prevention is worth a pound of cure." This statement is the heart of the
a)   remedial principle
b)   exposure principle
c)   persistence principle
d)   precautionary principle
e)   security principle

Ans: d
Difficulty: Medium
Response:
The Precautionary Principle; 7.5.2