

UNIVERSITY OF SWAZILAND

Faculty of Health Sciences

(BSC) IN ENVIRONMENTAL HEALTH

FINAL EXAMINATION PAPER 2005

TITLE OF PAPER: ENVIRONMENTAL POLLUTION AND ASSESSMENT

COURSE CODE : EHS 521

DURATION : THREE HOURS

MARKS : 100

INSTRUCTIONS : ANSWER ONLY FIVE QUESTIONS.

: EACH QUESTION CARRY 20 MARKS.

: QUESTIONS ONE AND TWO ARE COMPULSARY.

**: NO QUESTION PAPER SHOULD BE BROUGHT INTO NOR
OUT OF THE EXAMINATION ROOM.**

**: BEGIN EACH QUESTION ON A SEPARATE SHEET OF
PAPER.**

**DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE
INVIGILATOR.**

QUESTION ONE:

1. Of the following organisms, the group that is least likely to cause disease is
 - (a) protozoa
 - (b) bacteria
 - (c) algae
 - (d) parasitic worms

2. A good indicator of water quality is the number of
 - (a) ducks
 - (b) fish
 - (c) coliform bacteria
 - (d) snakes

3. A body of water can be depleted of oxygen by
 - (a) viruses and parasitic worms
 - (b) organic wastes
 - (c) sediments and suspended matter
 - (d) organic compounds such as oil, plastics, solvents, and detergents

4. Waste heat can
 - (a) cause algae blooms
 - (b) deplete water oxygen
 - (c) decrease water quality
 - (d) all the above answers

5. Nitrate and phosphates are examples of
 - (a) disease-causing agents
 - (b) oxygen-demanding plant nutrients
 - (c) inorganic plant nutrients

6. Oxygen sag curves
 - (a) may occur during spring floods
 - (b) occur when oxygen-demanding wastes are added to the water
 - (c) develop in fast-flowing rivers
 - (d) may occur upstream from a sewage treatment plant

7. Which of the following stages of cultural eutrophication occurs last
 - (a) fish kills
 - (b) increase in aerobic bacteria
 - (c) algal blooms
 - (d) increase in anaerobic bacteria

8. The common limiting factor in freshwater lakes most often emphasized in pollution prevention approaches is
 - (a) nitrogen

- (b) phosphorus
 - (c) calcium
 - (d) sulfur
9. Lichens are particularly useful for indicating
- (a) water pollution
 - (b) air pollution
 - (c) land pollution
 - (d) toxic-waste sites
10. The atmospheric layer containing 75% of the mass of the Earth's air is the
- (a) thermosphere
 - (b) mesosphere
 - (c) stratosphere
 - (d) troposphere
11. All of the following are photochemical oxidants except
- (a) dioxin
 - (b) hydrogen peroxide
 - (c) peroxyacyl nitrates (PAN)
 - (d) aldehydes, such as formaldehyde.
12. Gray-air smog comes from suspended particles of
- (a) carbon dioxide
 - (b) ammonium salts
 - (c) soot
 - (d) carbonic acid
13. Respiratory illnesses in developing countries is most likely to be caused by
- (a) formaldehyde
 - (b) cigarette smoke
 - (c) particulate matter
 - (d) asbestos
14. Pipe insulation and vinyl ceiling and floor tiles may be sources of
- (a) chloroform
 - (b) formaldehyde
 - (c) carbon monoxide
 - (d) asbestos
15. A waste is considered hazardous if it possesses one of four properties. Which of the following is not one of those properties?
- (a) Flammable
 - (b) Unstable
 - (c) Soluble
 - (d) Corrosive

16. Compost is most completely described as
- (a) Manure
 - (b) Landfill by-products
 - (c) Pure garbage
 - (d) Soil conditioner
17. Of the following methods of reducing hazardous waste, the most desirable is
- (a) Incineration
 - (b) Conversion to less hazardous material
 - (c) Perpetual storage
 - (d) deposit in ocean trenches
18. Deep-well injection of hazardous wastes can result in contamination of groundwater by
- (a) surface wastes leaching down
 - (b) leaking seals
 - (c) earthquake fractures
 - (d) all the above answers
19. Which of the following facts about dioxins is not correct? Dioxins can
- (a) cause immunological effects
 - (b) cause developmental effects
 - (c) promotes cancers
 - (d) can cause partial paralysis
20. Deep-well disposal of liquid hazardous wastes is
- (a) a complex process
 - (b) less visible than other waste-disposal methods
 - (c) more carefully regulated than other waste-disposal methods
 - (d) the most expensive waste-disposal method

TOTAL 20 MARKS

QUESTION TWO:

Briefly describe (citing five examples) how air pollution affects the following (5 marks each)

- (a) human health
- (b) plants
- (c) aquatic life
- (d) materials

TOTAL 20 MARKS

QUESTION THREE:

- (a) Describe a modern sanitary landfill (10 marks)
- (b) Summarize the benefits and drawbacks of burying solid wastes in a sanitary landfill (10 marks)

TOTAL 20 MARKS

QUESTION FOUR:

- (a) Describe the sequence of events that leads to lowering of oxygen levels in streams receiving organic wastes. (10 marks)
- (b) What are pathogenic organisms? (2 marks)
- (c) How do scientists determine whether pathogenic organisms may be present in water? (8 marks)

TOTAL 20 MARKS

QUESTION FIVE:

- (a) How does the size of particulates relate to their potential as a health threat? (10 marks)
- (b) Describe the mechanisms that protect the human respiratory system from the intrusion of particulates. (10 marks).

TOTAL 20 MARKS

QUESTION SIX:

- (a) Describe how a deep-well injection works as an alternative to hazardous waste disposal method. (5 marks)
- (b) Enumerate three advantages and three disadvantages of using the alternative mentioned in (a) above. (6 marks)
- (c) The World Health Organization estimates that 1. about 130-200 million Children around the world are at risk from lead, and 2. about 15-18 million children in developing countries suffer permanent brain damage because of lead poisoning, with 90% of the lead coming from leaded gasoline. As the senior environmental health manager in the ministry of health, you have been asked by the minister of health and social welfare to advice a parliamentary committee that is tasked with the reduction of exposure of Swazi children to lead. Propose here below nine ways that you will tell them as means of reducing lead exposure. (9 marks)

TOTAL 20 MARKS

GOOD LUCK!!!!