



**THE UNIVERSITY OF THE WEST INDIES**

**EXAMINATIONS OF: Summer – 2013/2014**

**CODE AND NAME OF COURSE: FOUN 1210 – Science, Medicine and  
Technology in Society**

**DATE AND TIME:**

**DURATION: 3 Hours**

**INSTRUCTIONS TO CANDIDATES:**

**This paper has 12 Pages and 58 Questions.**

**This examination consists of three Sections: Part A Multiple Choice Questions, and Parts B and C, Essay Questions.**

**Answer ALL questions in Part A in the Multiple Choice answer section of the examination booklet.**

**Answer ONE (1) question from Section B AND ONE (1) question from section C.**

**Section A is worth FIFTY (50) marks and each question in Sections B and C has a value of TWENTY FIVE (25) marks.**

**SECTION A**

1. Which of the following presents a major problem in tracking Bovine Spongiform Encephalopathy?
  - a. The causal agent is unknown.
  - b. Many years elapse between exposure and the development of symptoms.
  - c. Cattle do not display any symptoms.
  - d. Countries do not share information.
  
2. The human form of Bovine Spongiform Encephalopathy is transmitted as
  - a. vCJD.
  - b. scrapie.
  - c. foot and mouth.
  - d. a virus.
  
3. The Caribbean, with the exception of Trinidad and Tobago, has a large energy import bill in the form of
  - a. petroleum derivatives.
  - b. electricity.
  - c. solar energy components.
  - d. nuclear energy.
  
4. A hurricane can be viewed as
  - a. a carbon sink.
  - b. an energy sink
  - c. a heat engine.
  - d. an air flow regulator.
  
5. If a man is impotent, one way of him having a child with his wife is to use
  - a. amniocentesis.
  - b. artificial insemination.
  - c. genetic engineering.
  - d. cloning.

6. *In vitro* fertilization literally means
- “in body fertilization.”
  - “in glass fertilization.”
  - “virtual tissue culture.”
  - “cross pollination.”
7. In genetic engineering, what do geneticists use to cut long strands of DNA into shorter pieces?
- Sulphuric acid
  - Fine-beam lasers
  - Micro-scalpel
  - Enzymes
8. Recombinant DNA has made the large scale production of insulin possible by inserting the gene that codes for human insulin into which bacterium?
- Escherichia coli*
  - Staphylococcus aureus*
  - Chlamydia trachomatis*
  - Clostridium*
9. *Escherichia coli* that are modified with human genes are called
- stem cells.
  - retroviruses.
  - transgenic organisms.
  - cloning.
10. When an antigen invades the body, protection is provided by antibodies made by
- red blood cells.
  - all white cells.
  - B cells.
  - thrombocytes.

11. There is evidence that the average temperature of the world is increasing slowly. This statement is:
  - a. True during the summer and false during the winter.
  - b. Being debated.
  - c. False.
  - d. True.
  
12. Which of the following is caused by Global Warming?
  - a. Depletion of the ozone layer
  - b. Air currents around the world and affects weather patterns
  - c. Acid Rain
  - d. None of the above
  
13. The process of arriving at a specific scientific conclusion through simple rules of logic that move from a general premise is known as
  - a. paradigm shifts.
  - b. induction.
  - c. hypothetico-deduction.
  - d. deduction.
  
14. The occurrence of paradigm shifts suggests that the scientific method is NOT
  - a. completely honest.
  - b. completely objective.
  - c. very careful.
  - d. productive.
  
15. Scientists who practice NORMAL science
  - a. always function within the established paradigm.
  - b. are able to control all of the possible environmental variables.
  - c. do not subscribe to the normal set of fundamental assumptions.
  - d. are often immediately embraced by the scientific community.

16. Albert Einstein was a key figure in the paradigm shift of
- continental drift.
  - phlogiston.
  - heliocentrism.
  - gravity.
17. "Falsifiability" was a key characteristic of any scientific theory according to
- William Harvey.
  - Albert Einstein.
  - Karl Popper.
  - Thomas Kuhn.
18. In science, facts are based on evidence but are always
- mere guesses.
  - theory-laden.
  - unchanging laws.
  - changing arbitrarily.
19. Litmus paper is used to
- test the acidity and alkalinity of liquids.
  - test for lithium.
  - check for the truth value of a theory.
  - determine the presence of lipids.
20. The "Black Florence Nightingale" was a Caribbean doctress who traveled to Panama and worked during the Crimean War to deliver her unique brand of medical expertise. Her name was
- Mary Seacole.
  - Cicely Williams.
  - Nita Barrow.
  - Laura Secord.

21. The smallest units of compounds are
- enzymes.
  - molecules.
  - hydrogen and oxygen.
  - atoms.
22. Which of the following diseases is transmitted by a vector?
- Lou Gehrig's disease
  - Dengue
  - Skin cancer
  - Leukaemia
23. Haemophilia is normally found only in males. This disease is
- an autosomal recessive disease.
  - an autosomal dominant disease.
  - a sex-linked dominant disease.
  - a sex-linked recessive disease.
24. Which of the following statements is correct?
- HIV is suppressed with antibiotics.
  - Antibiotics will NOT cure bacterial infections.
  - Antibiotics attack antibodies.
  - Antibiotics destroy bacteria.
25. The division of cells to produce somatic growth is called
- meiosis.
  - stenosis.
  - mitosis.
  - narcosis.
26. An algorithm is a
- series of unambiguous executable steps to perform a task in a finite amount of time.
  - type of internet search engine.
  - programming language.
  - digital music channel.

27. The internet grew out of a project originally sponsored by which of the following?
- Private telecommunications corporations
  - Universities
  - The US Department of Defense
  - Individual scientists and engineers
28. Charles Darwin's theory of evolution was explained in his book published in 1859 and titled
- Evolution versus Creationism.*
  - The Origin of Species.*
  - The Origin of Man.*
  - The Origin of the Big Bang.*
29. Which of the following was an unfortunate consequence of Darwin's theory?
- Genetics
  - Eugenics
  - Lamarckianism
  - Paleontology
30. Semi-conductors are
- used to manufacture photovoltaic cells.
  - used to store energy as a compound.
  - a type of semi-permeable membrane.
  - plant chemicals that absorb half the wavelength of sunlight.
31. OTEC is a source of energy that
- is distilled from crude oil.
  - originates with the sun.
  - is harnessed from ocean tides.
  - utilizes the difference in the temperature of the water at the surface of the ocean and the water about 1000 metres deep.

32. What is removed at the bottom when the complex mixtures of hydrocarbons in crude oil are separated through fractional distillation?
- Pitch and tar
  - Gas
  - Gasoline
  - Kerosene
33. Solar panels that produce hot water are made of
- silicon based panels.
  - copper pipes and large sheets of metal painted black.
  - heat-producing, spinning generators.
  - chemical catalysts activated by sunlight.
34. One reason why aluminium is NOT produced from alumina in Jamaica and Guyana is the
- complex nature of this final step.
  - radioactive nature of alumina.
  - high cost of electrical energy.
  - environmental hazard of red earth.
35. Normal blood sugar levels range between:
- 50 and 60 milligrams per decilitre.
  - 90 and 210 milligrams per decilitre.
  - 70 and 110 milligrams per decilitre.
  - 10 and 50 milligrams per decilitre.
36. Diabetes mellitus has two types:
- Type I, IDDM and Type II, NIDDM.
  - Type I, NIDDM and Type II, IDDM.
  - Pancreatic and non-pancreatic.
  - Normal and abnormal.



37. It is understood academically that a model in science:
- I) Represents a real mechanism or process.
  - II) Is a perfect replica of reality.
  - III) Allows for visualisation and aids our imagination.
- a. I only
  - b. II only
  - c. I and III only
  - d. I, II and III
38. In gender theory, sex and gender are determined by
- a. genetics alone.
  - b. socialization and biology respectively.
  - c. parental lifestyles alone.
  - d. biology and socialization respectively.
39. The prevalence of women in science has historically been hindered by
- a. their lack of interest in scientific discovery.
  - b. the natural ability of men to more easily master scientific concepts.
  - c. the fact that women are not good at mathematics.
  - d. personal, structural and institutional bias.
40. Two of the most important factors that determine whether or not people do get the food they need are:
- a. origin and politics.
  - b. demand and supply.
  - c. quality and price.
  - d. availability and accessibility.
41. The number of people contracting any disease within a given period in a population is measured by its
- a. virulence.
  - b. incubation period.
  - c. incidence.
  - d. prevalence.

42. What is the name of the chromosome which determines that a human will be male?
- Y chromosome
  - XY genotype
  - AB blood type
  - X chromosome
43. It can be said that
- science controls the environment while technology explains.
  - science always comes before technology.
  - technology always comes before science.
  - science explains while technology controls the environments.
44. The first commercially grown genetically modified food to be sanctioned by the USA's Food and Drug Administration is
- rot resistant "Flavr Savr" tomato.
  - virus resistant papaya.
  - pesticide resistant sugar cane.
  - sweet corn that produces its own insecticide.
45. The dominant alleles of chromosome 4 bears the mutation responsible for
- Huntington's disease
  - Cystic Fibrosis
  - Sickle Cell Anaemia
  - Down's Syndrome
46. What type of chemical reaction releases energy from hydrocarbons?
- Endothermic
  - Combustion
  - Neutralization
  - Esterification
47. Which of the following is NOT a possible long-term impact of global warming?
- Increased desertification
  - Melting glaciers causing a rise in sea levels
  - Loss of coral reefs
  - Tsunamis caused by earthquakes

48. Who or what are Hiroshima and Nagasaki?
- a. Japanese scientists who won the Nobel Prize.
  - b. Japanese cities destroyed by atomic bombs.
  - c. Japanese cities that generate energy using nuclear power plants.
  - d. Genetically modified viruses.
49. Energy stored in a chemical substance is
- a. potential energy
  - b. thermal energy
  - c. kinetic energy
  - d. light energy
50. At fertilization, male and female gametes fuse to first produce
- a. a chromosome.
  - b. a foetus.
  - c. an embryo.
  - d. a zygote.

**END OF SECTION A**

**SECTION B**

**Answer ONE (1) question ONLY. Each question is worth twenty five (25) marks.**

- B.1. Review the science, debates and socio-economic impacts of climate change.
- B.2. Discuss the scientific method and the progress of science.
- B.3. Define the terms “science” and “technology.” Explore their general history, social impacts and the modern use of both in the development of medicine.
- B.4. Discuss the Caribbean’s key resources, their vulnerability, and their protection.

**END OF SECTION B**

**SECTION C**

**Answer ONE (1) question ONLY. Each question is worth twenty five (25) marks.**

- C.1. Explore the history, science, and impact of biotechnology on society. Briefly outline some of the ethical issues that have emerged with the advance of this science and its associated technologies.
- C.2. Identify and discuss with examples the various categories of human diseases.
- C.3. How does Fractional Distillation work? Write an essay on the threats and opportunities associated with the use of natural gas and crude oil as sources of energy in the Caribbean.
- C.4. Write an essay entitled “The Digital Age: Modern Technology, Old Science.”

**END OF PAPER**