



THE UNIVERSITY OF THE WEST INDIES

EXAMINATIONS OF: Semester II – 2015/2016

**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. The process of arriving at general scientific statements by making an appropriate number of specific observations is known as
 - a. deduction.
 - b. induction.
 - c. hypothetico-deduction.
 - d. paradigm shifts.

2. The scientific method is NOT completely objective because
 - a. scientific facts are “theory-laden”.
 - b. scientists sometimes make mistakes.
 - c. scientific instruments are not perfect.
 - d. deduction is not truth preserving.

3. An argument that starts with a general statement, and then uses a minor premise to arrive at a specific conclusion is
 - a. always sound.
 - b. inductive.
 - c. not valid.
 - d. deductive.

4. Which of the following is NOT true of petroleum based fuels?
 - a. They are currently more accessible than alternative sources of energy.
 - b. Their energy originated with the sun.
 - c. They are renewable.
 - d. They affect the entire economy of all countries.

5. An atom is
 - a. the smallest unit of an element.
 - b. the smallest unit of water.
 - c. found only in metals.
 - d. the nucleus of living cells.

6. Enzymes are
 - a. biological catalysts.
 - b. the energy storehouse of cells.
 - c. biological waste.
 - d. only found in detergents.

7. Diamond is hard and expensive while coal is soft and cheap, yet they are both
 - a. easily dissolved in a solution of acid.
 - b. easily manufactured.
 - c. found in volcanoes.
 - d. made of carbon atoms in different configurations.

8. Prions are the causative agent for which of the following diseases?
 - a. Bovine Spongiform Encephalopathy (BSE)
 - b. H1N1
 - c. Foot and Mouth Disease
 - d. H5N1

9. Which massive molecule codes the genotype that determines the phenotype?
 - a. DNA
 - b. An enzyme
 - c. A protein
 - d. An antibiotic

10. Meiosis differs from mitosis. This is because
 - a. meiosis reduces the number of chromosomes by half while mitosis does not.
 - b. meiosis produces identical copies of cells while mitosis does not.
 - c. meiosis occurs in every cell while mitosis only occurs in gametes.
 - d. meiosis only occurs in females.

11. The human haploid number of chromosomes is
 - a. 46
 - b. 28
 - c. 23
 - d. 266

12. Which of the following statements is correct?
- Antibiotics will cure viral infections but not bacterial infections.
 - Antibiotics will cure all infections.
 - Antibiotics work as a placebo.
 - Antibiotics will cure bacterial infections but not viral infections.
13. Diabetes may be considered
- a genetic disease.
 - an autoimmune disease.
 - a chronic lifestyle disease.
 - all of the above.
14. Although there is some controversy surrounding Global Warming, it is true to say that
- everyone agrees that Global Warming is caused by man's activities.
 - everyone agrees that there is an increase in average global temperature.
 - Global Warming is part of a natural cycle.
 - climate change will always cause droughts.
15. Foot and mouth disease is normally controlled by
- banning the importation of lamb meat.
 - disinfecting travellers.
 - cooking lamb properly.
 - vaccinating local cattle.
16. A rise in temperature of the ocean
- causes glaciers to melt more rapidly.
 - bleaches coral reefs.
 - makes them less effective carbon sinks.
 - All of the above.
17. A shift from one set of fundamental assumptions to another set of fundamental assumptions is called
- falsification.
 - theory-ladenness.
 - hypothesis formulation.
 - a paradigm shift.

18. Which of the following is having the greatest impact on developing countries?
- Landline telephones
 - The personal computer
 - The television
 - Cellular phones
19. Parts of computers are commonly known by acronyms. What is RAM?
- Readily accessible mouse
 - Readily accessible monitor
 - Random access memory
 - Random algorithm monitor
20. A series of unambiguous executable steps to perform some task in a finite amount of time is
- a programme code.
 - an algorithm.
 - a website.
 - HTML code.
21. The World Wide Web (WWW) is based on which of the following two concepts?
- Hyper text and graphical user interface
 - Hardware and software
 - Registers and output units
 - Microsoft Office and online payment systems
22. The internet was probably designed originally
- to manage large private corporations.
 - to predict weather systems.
 - by the US military as a form of decentralized communication for defensive purposes.
 - as a way for government to conduct censuses.

23. Which of the following involved a paradigm shift?
- Geocentrism to Heliocentrism
 - Solar energy to wind energy
 - Creationism to Intelligent Design
 - Increasing the sample size of a sociological survey
24. The final step in producing aluminium from alumina in Jamaica is NOT economically feasible because of
- red mud pollution.
 - high labour costs.
 - the high cost of electrolysis.
 - All of the above.
25. Crossing XX with XY on average will produce the following:
- 50% males and 50% females
 - All males
 - All females
 - Cannot say
26. Which of the following is a list of genetic diseases ONLY?
- Huntington's disease, Cystic Fibrosis, Sickle Cell Anaemia, Down's Syndrome
 - Hypertension, Cystic Fibrosis, Sickle Cell Anaemia, Down's Syndrome
 - Huntington's disease, Cystic Fibrosis, Cancer, Down's Syndrome
 - Huntington's disease, Diabetes, Sickle Cell Anaemia, Down's Syndrome
27. What is the term used for "primitive cells" with the capacity to become several types of specialised adult cell?
- Early Cells
 - Gene Cells
 - Somatic Cells
 - Stem Cells

28. Recombinant DNA has made the large scale production of insulin possible by inserting the gene that codes for human insulin into which bacterium?
- a. *Escherichia coli*
 - b. *Staphylococcus aureus*
 - c. *Chlamydia trachomatis*
 - d. *Clostridium*
29. Stem Cell research is controversial when
- a. the clones produced may be dangerous.
 - b. the cells are harvested from unused human embryos.
 - c. the cells cause cancer.
 - d. diseases are genetic.
30. Making Papaya resistant to ringspot viral disease was an example of
- a. transgenic modification.
 - b. tissue culture.
 - c. cross-breeding.
 - d. All of the above.
31. The mechanisms that drive Darwin's theory of evolution are
- a. mutation and natural selection.
 - b. intelligent direction.
 - c. genetic complexity.
 - d. long life-cycles.
32. Darwin's theory of evolution says that
- a. humans descended from monkeys.
 - b. humans and primates have a common ancestor.
 - c. we should be able to see monkeys becoming human during our life time.
 - d. the universe started with a Big Bang.

33. $E = mc^2$ was derived by
- Karl Popper.
 - Thomas Kuhn
 - Albert Einstein.
 - Isaac Newton
34. Marie Curie was a woman scientist who
- won two (2) Nobel prizes.
 - played a major role in describing DNA's double helix structure.
 - invented the atomic bomb.
 - pioneered botany.
35. In gender theory sex and gender are determined by
- genetics alone.
 - education.
 - parental lifestyles alone.
 - genetics (biology) and socialization respectively.
36. The smallest units of compounds are
- subatomic particles.
 - molecules.
 - hydrogen and oxygen.
 - vibrating strings.
37. Which type of renewable energy has been most successful in Barbados?
- Solar electricity
 - Biogas
 - Natural gas
 - Solar heating
38. Which one of the following statements explains why technology is different from science?
- Technology came before science.
 - Technology does not necessarily depend on explanations.
 - Science came before technology.
 - Ancient civilizations had no science.

39. Which industrial process is used to separate complex mixtures of hydrocarbons in crude oil?
- Precipitation
 - Electrolysis
 - Crystallization
 - Fractional distillation
40. A car in motion makes which of the following energy conversions?
- Chemically stored potential energy to kinetic energy.
 - Kinetic energy to stored electrical energy.
 - Electrical energy to light energy.
 - All of the above.
41. Which of the following is correct?
- HIV/AIDS cannot be cured using antibiotics.
 - HIV/AIDS cannot be transmitted through casual contact but requires and exchange of bodily fluids.
 - Both (a) and (b) above.
 - Neither (a) nor (b) above.
42. Hypertension and diabetes are
- treatable using antibiotics.
 - communicable diseases.
 - caused by viruses.
 - chronic non-communicable diseases.
43. The method used to detect genetic abnormalities in a human foetus is called
- hybridomas.
 - amniocentesis.
 - stem cell therapy.
 - DNA profiling.

44. Leo Szilard realised that the advances made in physics could be used to build a super weapon. He then did the following:
- Encouraged Albert Einstein to inform the President Roosevelt of this possibility.
 - Started a petition against using the weapon.
 - Only (a) above.
 - Both (a) and (b) above.
45. Which of the following is caused by Global Warming?
- Depletion of the ozone layer
 - Acid rain
 - Climate Change
 - All of the above
46. William Harvey's approach to science was said to be innovative and experimental. This is because he
- interrupted the normal flow of nature in living organisms to observe the results.
 - used instruments.
 - used mathematics.
 - speculated on reality by using existing theories.
47. Long coiled strands of DNA are stored in the nuclei of human somatic cells as
- 46 chromosomes.
 - genes.
 - ribosomes.
 - Mitochondria
48. "The set of tools and techniques for controlling one's environment" is the definition of
- history
 - technology
 - medicine
 - science

49. Green House gases warm the earth by
- a. radiating their own internal heat.
 - b. trapping and conducting energy from the earth's core.
 - c. vibration and friction.
 - d. trapping the sun's energy that is being reflected from the earth's surface.
50. Persons with a Body Mass Index of over 30 are
- a. under weight
 - b. diabetic
 - c. hypertensive
 - d. obese

END OF SECTION A

SECTION B

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

- B.1. What is global warming? Discuss the social and economic consequences of global warming and climate change in the Caribbean.
- B.2. Write an essay on the strengths and weaknesses of induction, deduction and the hypothetico-deductive method while explaining how the scientific method sometimes leads to “scientific revolutions.”
- B.3. What is the difference between “science” and “technology”? With relevant examples discuss which one may have come first historically and describe their modern interplay in medicine.
- B.4. Apart from our people, what are our most important resources in the Caribbean? Using examples explain how we have protected them in the past and suggest ideas for their security into the future.

END OF SECTION B

SECTION C

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

- C.1. What do you understand by the notions of “modern” and “ancient” biotechnology? Using your knowledge of genetics and genetic modification, discuss the benefits and ethical problems of biotechnological advances.
- C.2. Dealing with **chronic non-communicable** diseases is a serious developmental challenge to Caribbean governments. Advise the government of your country on how to combat this challenge while citing the most problematic diseases and their causes.
- C.3. Write an essay explaining the nature of energy and its critical role in Caribbean industrial development.
- C.4. What are the consequences of creating global communities using the Internet? Consider both the positive and negative aspects of, for example, e-Commerce, political interest groups, criminal/terrorist activity, privacy issues, interpersonal relations, nationhood, neighbourhood cohesion, and social networking.

END OF PAPER

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