



THE OPEN UNIVERSITY OF SRI LANKA  
 M.Sc in ENVIRONMENTAL SCIENCE – LEVEL 08  
 FINAL EXAMINATION – 2016/17  
 NEP2220 – PHILOSOPHY OF SCIENCE  
 THREE HOURS (ESSAY TYPE PAPER)  
 OPEN BOOK EXAMINATION (OBT)

Date: 12<sup>th</sup> November 2017

Time: 0930 hrs. – 1230 hrs.

Answer question no. 01 and any four (4) other questions only (Total of 05 questions).

Q (01). Consider the following quotations

(a). “In the west, nature has always been thought of as being governed by laws laid down by an external God. The primary urge in Bacon was to find a method of deciphering (revealing) these divine laws, and then playing God with nature and man. For Kepler, Descartes, Boyle and Newton, the laws of nature which they believed ‘they were revealing the divine laws laid down by a supra-personal, supra-rational being (God) to the human mind’.

For the Chinese, however, there never was any celestial lawgiver issuing commands to nature. Nature was self-governed, unfolding itself according to its own internal harmonies. The object of science for the Chinese therefore was not to decipher the laws in order to put nature to human use, but to find out the way of nature, the Tao of Heaven, in order to be able to go along with it, to live according to the Tao”

Joseph Needham

(b). “The earth does not belong to man, man belongs to the earth. All things are connected like the blood which unites one family. Whatever befalls the earth, befalls the sons of the earth. Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself”.

Native American Chief Seattle

(c). The rise of the mechanical view as an instrument of power not just over nature but also over the original inhabitants of America (American Indians). The notions of these original American Indians about the working of nature are ridiculous. Their perception of Nature, ‘as a kind of goddess worthy of veneration’ has been a discouraging impediment to the empire of man over the inferior creatures of God’.

Robert Boyle

Based on the above three quotations and the course material of NEP2220 (Session 1) regarding Bacon’s world view.

- (i). Compare and contrast the Western European views and the Asian/other non-western views towards Nature and Man. (about 500 words)
- (ii). Explain briefly how the views of early Western European intellectuals like Francis Bacon, Robert Boyle and others which contributed to the development of western science over the last Five Hundred years has resulted in polluting the air, water and soil, thereby endangering the survival of life on Earth. (about 300 words)

- Q(02) (i). Compare and contrast the views of Inductivists and Hypothesisists regarding the following  
 (a). Method of science (define) (c). Theoretical terms (b) Hallmarks of science
- (ii). What was the critique of David Hume regarding the method of induction?
- (iii). Explain briefly the link between the method of induction and 'cause-effect relation' (causality)  
 (Hint: Consider the procedure adopted by medical scientists in determining the course for a particular fever (eg: Malaria))
- Q(03) (i). Explain the views of the school of philosophy called 'Positivists' regarding the method to be followed by the practitioners of various knowledge systems.
- (ii). Compare and contrast the views of Logical Positivists and Karl Popper regarding the following.  
 (a). Observations (b). Theories of science (c). Methodology of science
- (iii). State two arguments against the view of Logical Positivists namely "observations are theory independent".  
 Give an example to justify your answer.
- Q(04) (i). How does Popper demarcate science from non-science?  
 (ii). Why did Popper reject ad-hoc modifications to theories?  
 (iii). What is the main drawback of Popper's method of falsification?  
 Give an example to justify your answer.
- Q(05) (i). Explain briefly the role of 'Scientific Community'  
 (a). during a period of 'Normal Science' (b). during a revolution in science
- (ii). Explain briefly the views of Karl Popper and Thomas Kuhn regarding the 'Progress of science'.
- Q(06) (i). Explain briefly the following in the context of 'Research Programmes of Imre Lakatos'  
 (a). Hard-core of a programme.  
 (b). Negative heuristic of a programme  
 (c). Positive heuristic of a programme  
 (d). Progressive programmes  
 (e). Degenerating programmes
- (ii). Consider Newtonian Physics (Newton's research programme on the motion of bodies to identify the  
 (a). Hard-core of Newton's programme  
 (b). Positive heuristic of Newton's programme
- Q(07) (i). Compare and contrast the views of Karl Popper, Thomas Kuhn and Paul Feyerabend regarding the 'Uniqueness of Science'
- (ii). Explain briefly the critique of Paul Feyerabend regarding Karl Popper's views on 'Falsification' and "Ad-hoc modification of theories"
- (iii). Compare and contrast the views of Paul Feyerabend and Thomas Kuhn regarding 'Incommensurability of Theories'.