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THE OPEN UNIVERSITY OF SRI LANKA

M.SC. IN ENVIRONMENTAL SCIENCE – LEVEL 08

FINAL EXAMINATION – 2017/2018

MHPA307/NEP2220 – PHILOSOPHY OF SCIENCE

DURATION – THREE (03) HOURS (ESSAY TYPE PAPER)

OPEN BOOK EXAMINATION (OBT)

Date: 25th November 2018 Time: 0930hrs to 1230hrs

Answer question no. 01 and any four (04) other questions only. (Total of five (05) questions)

01. Read the following passage and the course materials of MPHA307 to answer the questions (i) (ii) & (iii) given below.

The process of normal science, that of articulation and application of the paradigm, is more or less mechanical. But despite being mechanical in nature, this process has nothing to do with the objective, value-free apprehension of reality that Bacon advocated. On the contrary, nature is approached in terms of categories and concepts supplied by the paradigm, and the data are worked upon through the ideal problem solutions and experimental procedures afforded by the paradigm. In fact, according to Kuhn, the paradigms so deeply condition the scientists' perceptions during their normal activities, that it can be said that not only normal science, but a scientist's world itself is constituted by the paradigm.

The hold of the categories supplied by paradigms on the scientists is weakened by the crisis situations and in these revolutionary stages of scientific activity, the scientists do behave to some extent like innocent children free of all preconceptions about the world. Even for the scientific community, acceptance of a new paradigm is hardly a mechanical process based on 'certain rule and method', but involves intangible considerations like aesthetic appeal, neatness, simplicity, etc. Having arrived at this completely non-Baconian understanding of the process of scientific development, and having seen the influence of non-mechanical cultural and personal factors in the crucial stages of the history of science, on expects that Kuhn would abandon the idea of western science being somehow unique, compared to other non-western knowledge systems. One would expect him to take a relativistic position, allowing for the possibility of different cultures arriving at different yet equally valid knowledge systems.

However, Kuhn is quick to point out that scientific knowledge is not relative. He tells us that even though modern science cannot be shown to be a transcript of the divine mind (God), yet it remains the uniquely valid knowledge system available to humanity, simply because no other culture has ever possessed any science. Only the civilizations that

descended from Hellenic Greece (Western Europe) have possessed more than the most rudimentary sciences of other cultures. However Kuhn does not happen to be an authority on the non-Hellenic (non-western) civilizations and their sciences.

Feyerabend complains, with justifications that defenders of science typically judge it to be superior to other systems of knowledge without adequately investigating those other systems. Feyerabend is not prepared to accept the necessary superiority of science over other systems of knowledge. Further, in the light of his incommensurability thesis, he rejects the idea that there ever can be a decisive argument in favour of science over other systems of knowledge incommensurable with it. If western science is to be compared with other systems of knowledge, then it will be necessary to investigate the nature, aims and methods of science of those other systems of knowledge. This will be done by the study of historical records, text books, original papers, records of meetings and private conversations, letters and the like.

i. Explain briefly how Kuhn attacks (criticizes) the popular view of western science advocated by Bacon namely, 'western science is an objective, value free knowledge system', utilizing the role played by the concept 'paradigm' during the process of normal science, according to the above passage.

ii. Explain briefly the role of the 'Scientific Community' in replacing an existing paradigm by a new paradigm during a revolution in science. (Hint: you should mention about the rationality of this process and the factors that influence the scientific community in this process)

iii. Explain briefly the critique of Feyerabend regarding Thomas Kuhn's view that western science is unique among other knowledge system.

iv. Outline (state) the ontological, and epistemological assumptions of reductionism which guide modern western science.

v. Explain briefly how the above mentioned assumptions of reductionism contribute to aggravate the environmental crisis that threatens the very existence of life on earth.

02. i. Explain briefly the method of science advocated by Bacon.

ii. Explain briefly how the above mentioned method is linked with 'certainty' and 'breath' in science.

iii. Explain briefly the method of science advocated by Galileo.

iv. Explain briefly how the above method is linked with 'novelty' and 'depth' in science.

v. Compare and contrast the views of inductists and Hypothesists regarding "Theoretical Entities" in entities.

vi. Give two examples of theoretical entitles.

03. i. What was the critique of David Hume regarding the method of Induction?

ii. Why didn't Hume accept the alternative method of Hypothetico-deduction?

iii. Why did he reject the defense of Induction proposed by inductivists namely 'uniformity in nature'?

iv. What was Hume's final position (stand-point) regarding the method of induction?

04. i. Explain briefly the views of 'Positivists' regarding the practice of various knowledge systems especially social sciences.

ii. State two arguments against the view of Logical Positivists namely 'observations are theory independent'.

Give an example to justify your answer.

iii. Explain briefly the views of Logical Positivists regarding the creation (construction) of theories.

iv. Compare and contrast the methods of science advocated by Logical Positivists and Karl Popper.

05. i. Explain briefly how Karl Popper apply his concept 'Verisimilitude' to describe the 'progress of science'.

ii. Explain briefly the views of Karl Popper regarding 'Ad-hoc modification' of theories.

iii. How does Popper apply his above mentioned views regarding the ad-hoc modifications to theories to show that Karl Marx's theory on the evolution of societies is preudo-science?

iv. What is the main draw-back of Popper's method of falsification?

06. Briefly explain the following relationships based on Thomas Kuhn's philosophy of science.

i. Normal Science, Paradigm and Scientific community.

ii. Revolutions in science, Paradigms, anomalies and Scientific Community.

iii. Uniqueness of science, Paradigms and Schools of science.

iv. Progress of science, Paradigms and Puzzle solving.

vi. Incommensurability and Paradigms.

07. 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.