



පේරාදෙණිය විශ්වවිද්‍යාලය
பேராதனைப் பல்கலைக் கழகம்
UNIVERSITY OF PERADENIYA

දුරස්ථ හා අඛණ්ඩ අධ්‍යාපන කේන්ද්‍රය
தொலை தொடர் கல்வி நிலையம்
CENTRE FOR DISTANCE AND CONTINUING EDUCATION

පළමු වසර ශාස්ත්‍රවේදී උපාධි පරීක්ෂණය (බාහිර - නව නිර්දේශය)
දෙසැම්බර් 2018

முதலாம் வருட கலைத்தேர்வு பரீட்சை (வெளிவாரி - புதிய பாடத்திட்டம்)
டிசம்பர் - 2018

1st YEAR (100 LEVEL) EXAMINATION IN BACHELOR OF ARTS (EXTERNAL - NEW SYLLABUS) DECEMBER 2018

SUPE 011
Logic and Scientific Method

Answer FIVE (05) Questions only selecting at least TWO each part
Time allowed: Three (03) Hours
The total number of questions in this paper is 10

PART I

- (01) Symbolize the following arguments and show them to be valid by deriving the conclusions from premises. In each case, give your scheme of abbreviation.
- (i) It is not the case that David is a philosopher if only he is a British man. David is a philosopher. Therefore, he is a British man.
- (ii) He goes Kandy while she goes Colombo. If Mother goes Colombo then she does not go Colombo. Either Mother goes Colombo or Father comes from Colombo. Therefore He goes Kandy and father comes from Colombo.
- (iii) If either Hegal or Plato is an idealist then Marx is a materialist. If Engles is a Christian then Marx is not a materialist. Therefore If Plato is an idealist then Engles is not a Christian.
- (iv) If both Sri Lankan and Indian teams are weak then England team will win the game. Therefore, If England team will not win the game then either Sri Lanka team is not weak or Indian team is not weak.

(05 marks for each part)

P.T.O.

(02) Prove the following theorems by the method of derivation.

- (i) $[(P \vee \sim P) \vee Q]$
- (ii) $[(\sim P \vee Q) \leftrightarrow (P \rightarrow Q)]$
- (iii) $[P \rightarrow Q] \leftrightarrow \sim(P \wedge \sim Q)$
- (iv) $[(P \rightarrow Q) \vee (Q \rightarrow R)]$

(05 marks for each part)

(03) Symbolize the following arguments giving your schemes of abbreviation and determine their validity or invalidity by the indirect method of truth tables.

- (a) If Ravana is a legend then Ramayana is a fiction. Ravana is not a legend and Ramayana is not a fiction. Therefore, Rama invaded Sri Lanka.
- (b) Both heliocentric theory and geocentric theory can not be correct. If heliocentric theory is correct then Copernicus is intelligent. Heliocentric theory is correct. Therefore, Ptolemy is not correct.
- (c) If we respect our environment then we can not destroy it. The environment is sacred. Therefore, we respect our environment.
- (d) If you jumps up then she falls down. If she falls down then you goes up. Therefore, If you jumps up then you goes up.

(05 marks for each)

(04) Symbolize the following arguments in terms of classes and determine their validity using Venn diagrams.

- (i) All Sri Lankans are clever. All clever people are intelligent. Therefore, all intelligent people are Sri Lankans.
- (ii) Karl Marx is a Philosopher. Aristotle is a Philosopher. Therefore both Karl Marx and Aristotle are Philosophers.
- (iii) Some politicians are educated. All educated people have disciplines. Therefore, some politicians have disciplines.
- (iv) No Philosopher is a scientist. Newton is a scientist. Therefore, Newton is not a philosopher.

(05 marks for each)

P.T.O.

(05) Write short notes on any **four** of followings.

- i. Simple Sentences.
- ii. Strong disjunction.
- iii. Aristotelian laws of thought.
- iv. Analytic and synthetic propositions.
- v. Class complement.
- vi. Indirect method of derivation.

(05 marks for each)

PART II

(06) Distinguish between;

- i. Natural and Social Sciences.
- ii. Pure and Applied sciences.
- iii. Science and Technology
- iv. Empirical sciences and Non- empirical sciences.

(05 marks for each)

(07) (a) What do you mean by "Scientific Method".

(05 Marks)

(b) Give brief notes on following;

- i. Methodologist and Scientist.
- ii. The concept of Objectivity in Sciences.
- iii. Hypothetical deductive method.

(05 marks for each)

P.T.O.

(08) (a) The method of experiment is limited only for scientific researchers in the realms of natural sciences". Comment.

(10 Marks)

(b) Briefly explain following illustrating your answer with example.

I. Crucial Tests.

II. Limitations of Natural Observation.

(05 marks for each)

(09) **Either,**

(a) What is a good scientific hypothesis?

(05 Marks)

(b) Show with a suitable example the steps in the construction of a scientific Hypothesis by a scientist.

(15 Marks)

Or,

(a) What is probability of an event?

(05 Marks)

(b) Explain why the probability of an any event lies between zero and one.

(05 Marks)

(c) Examine the traditional definition of probability and its limitations.

(10 Marks)

P.T.O.

(10) Write short notes on any **four** of following:

- i. Scientific explanation.
- ii. Theories and laws.
- iii. Animal rights and science
- iv. Use of statistics in social sciences.
- v. The method of discovery in science.
- vi. Galileo.
- vii. Copernicus.

(05 marks for each)