



#### UNIVERSITY OF PERADENIYA

### CENTRE FOR DISTANCE AND CONTINUING EDUCATION

ශාස්තුවේදී උපාධි (බාහිර - නව නිර්දේශය) පරීකෳණය 100 මට්ටම - 2020\_

கலைத்தேர்வுப் பரீட்சை (வெளிவாரி–புதிய பாடத்திட்டம்) 100 வது தேர்ச்சி மட்டம்

\_ 2020

### (SUPE 104-LOGIC AND SCIENTIFIC METHOD)

മാര്യ മ്യാ (03) മുമദി. ഗ്രഞ്ബ്വ(03) ഥഞിத்தியாலங்கள், Time three **(03)** Hours. තොපැහැදිලි අත් අකුරුවලට ලකුණු කපනු ලැබේ. எழுத்து தெளிவில்லாதவிடத்து புள்ளிகள் குறைக்கப்படும். Marks will be deducted for illegible hand writing.

පළමු කොටසෙන් අඩුම තරමේ පුශ්න දෙකක් (02) ද දෙවන කොටසෙන් අඩුම තරමේ පුශ්න එකක් (01) ද තෝරාගෙන පුශ්න පහකට(05) පමණක් පිළිතුරු සපයන්න

ஞைப்படுக் ஒன்றில் குறைந்தது இரண்டு வினாக்களுக்கும் பகுதி இரண்டில் குறைந்தது ஒரு வினாவுமாக மொத்தம் 05 வினாக்களுக்கு மட்டும் விடையளிக்குக.

Answer Five (05) Questions only, selecting at least two (02) from part I and at least one (01) from part II.

මෙම පුශ්න පතුයේ අඩංගු පුශ්න සංඛ්‍යාව 10 කි.

இந்த வினாப்பத்திரத்தில் 10 வினாக்கள் உள்ளன.

There are 10 questions in the question paper,

# PART I

- 01. Symbolize the following arguments and show them to be valid by the method of derivation.
  - i. If you go abroad then you will not pass the examination. Either you will pass the examination or you will get married. Therefore, if you go abroad then either you will get married or you will get a job.
  - ii. If the government takes necessary steps to control COVID 19, then people will vote for the government. If the government will not take the necessary steps to control COVID 19, then the economy of the country will go down. Either people will not vote for the government or the economy of the country will not go down. Therefore, If and only if the government will take the necessary steps to control COVID 19, then people will vote for the government.
  - If either America or Brazzil can find a medicine for the virus, then India can buy the medicine for the virus. If either China or Japan can find a medicine for the virus, then India cannot buy the medicine for the virus. Either Brazzil cannot find a medicine for the virus or China can find a medicine for the virus. Therefore, either Brazzil cannot find a medicine for the virus or Japan can find a medicine for the virus.
  - iv. Both Aristotle and Homer are not Philosophers. Aristotle is a philosopher. Therefore, Homer is not a philosopher.

(05x4=20 Marks)

P.T.O.

- Prove the following theorems by the method of derivation. 02.
  - $(PV \sim P)$

- ii.  $[P \rightarrow (\sim P \rightarrow Q)]$
- iii.
- $[(p \land Q) \rightarrow (P \leftrightarrow Q)]$  iv.  $[(P \rightarrow Q) \lor (Q \rightarrow R)]$

(05x4=20 Marks)

- Symbolize the following arguments by giving your scheme of abbreviation and test them for the 03. validity by the method of indirect truth table.
  - If she is educated then she is a lucky woman. Either she is educated or she is a rich (i) woman. Neither she is educated nor she is a lucky woman. Therefore, she is not a rich woman.
  - Students pass well if only they have answered correctly. Students face well for the (ii) examination if only they have done well their exercises. Students face well for the examination and they pass well. Therefore, they have done well their exercises and they have answered correctly.
  - If rabbit win the race then Achilus will not win the race and if Achilus win the race then (iii) rabbit will not win the race. Therefore, both rabbit and Achilus will not win the race.
  - If the government can reduce the price of goods then people will be happy and people (iv) will stop all union actions against the government. If the government can reduce the taxes then people will be happy and they will stop all union actions against the government. Either government can reduce the price of goods or people will stop all union actions against the government. Therefore, either government can reduce the taxes or people will be happy.

(05x4=20 Marks)

- Symbolize the following arguments in terms of classes and determine their validity by using 04. Venn diagrams.
  - All beautiful things are valuable. Some ladies are beautiful. Therefore, some ladies are (i) not valuable.
  - All politicians are not famous. Raja is not a politician. Therefore, he is not famous. (ii)
  - Some are rich. Some are poor. Therefore, some rich people are poor. (iii)
  - No writer is a film director. Some film directors are players. Therefore, no player is a (iv) writer.

(05x4=20 Marks)

P.T.O.

- Write short notes on any four of the followings.
  - i. Direct Method of truth table.
  - ii. Aristotelian laws of thought.
  - iii. Logical constants and variables.
  - iv. Stylistic variants.
  - (v) Truth and Validity.
  - (vi) Universe of Discourse.

(05x4=20 Marks)

## PART II

06. a) Briefly examine the characteristics of a science according to Karl Popper's demarcation principle.

(10 Marks)

b) Identify and write separately the Social Sciences and Humanities out of following given disciplines.

Geology, Sociology, Mathematics, Fine Arts, Linguistic, Psychology, English, Biology, History, Buddhist Studies, Archeology, Philosophy, Music and Zoology

(10 Marks)

07. a) Examine the difference between scientific observations and scientific experimentations with examples.

(10 Marks)

- b) Explain following research methods with examples.
  - i. Case study Method
  - ii. Participant observation Method

(05x2=10 Marks)

P.T.O.

How do you understand the concept of "objectivity"?. 08. a) (05 Marks) Write an essay on "the objectivity in Social Sciences". b) (15 Marks) What are the attributes of a sound scientific hypothesis. 09. a) (10 Marks) Outline the general steps in forming of a scientific hypothesis by a scientist. b) (10 Marks) Write short notes on any **four** (04) of followings: 10.

- i. Francis Bacon's Inductivism.
- ii. John S. Mill's laws of causality.
- iii. Deductive Falsificationism.
- iv. Standard Deviation.
- v. Classical Interpretation of Probability.
- vi. Auxiliary hypotheses

(05x4=20 Marks)

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