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| **SUBJECT:** | PHILOSOPHY |
| **DATE:** | 27$^{th}$ May 2014 |
| **TIME:** | 4.00 p.m. to 7.00 p.m. |

## Directions to Candidates
Answer **THREE** questions in all, **ONE** from **EACH** section. Questions carry equal marks.

### Section A: Logic

1. (a) (i)  What is meant by saying that the implication A < B is valid?
   (ii)  What is meant by saying that the equivalence A >< B is valid?

   (b) (i)  How many interpretations of the following formula are models of it: ¬(B ∧ ¬B)?
   (ii)  What is the name given to this kind of formula?

   (c)  Express the following propositions symbolically:
   (i)  If Theresa went roller-skating, then she had booked.
   (ii)  Theresa went roller-skating only if she had booked.
   (iii)  Theresa did not go roller-skating unless she had booked.
   (iv)  Theresa neither went karting nor roller-skating.

   (d)  Translate symbolically the following argument and, by using truth-tables, check whether the implication involved is valid. Give a reason for your answer.
   If it is spring time then the tulips are in bloom.
   The tulips are not in bloom. Therefore it is not spring time.

   (e) (i)  Write down the truth-table of the formula "Either A or B".
   (ii)  A formula which is implied by "Either A or B" has one of four truth-tables. Write down these four truth-tables.

   (f)  Fill in the blanks:
   (i)  ¬ (A ∧ B) >< _____ is valid (de Morgan's)
   (ii)  ¬ (A ∧ B) < ¬ A ∨ ¬ B <=> _____ is admissible (duality principle)
   (iii) A → (B ∨ C) >< _____ is valid (contraposition)
   (iv) A < (B ∨ C) <=> _____ is admissible (transportation)

*Please turn the page.*

2. (a) By means of an example explain in **not more than 10 lines** how it is possible for one to assert ¬(a∧b) without being able to assert one of ¬a and ¬b.

(b) How would you introduce the conjunctor (∧) ?

(c) Translate symbolically the following argument and, using truth-tables, check whether the implication involved is valid. Give a reason for your answer.
If Christina is hungry then she cooks a meal or buys a take-away. Therefore if Christina is hungry and does not buy a take-away then she cooks a meal.

(d) Which, if any, of the following implications are valid?
(i)   A→B,, A < B
(ii)  A→B,, B < A
(iii) A→B,, ¬A < ¬B
(iv)  A→B,, ¬B < ¬A

(e) What conclusion, in words, can be derived when the transitivity of *if...then* (→) is applied to the following two premises:
If there is no electricity then the fridge does not work. If the fridge does not work, the food goes bad.

(f) (i) Fill in the blanks:
A ∧ (B ∧ C) >< _____ (∧ is associative)
A ∧ (B ∧ C) >< _____ (∧ is self distributive)
(ii) Use one of the above equivalences to simplify, in words, the proposition:
Karl and Mark are playing cards and Karl and Andrew are playing cards.

## Section B: Ethics

3. 'Treat the Earth well. We do not inherit the Earth from our ancestors; we borrow it from our children.' Discuss.

4. Can war ever be justified? Give reasons for your answer.

## Section C: History of Philosophy

5. How does Aristotle analyse the phenomenon of change?
*Aristotile kif janalizza l-fenomenu tal-bidla?*

6. A key component of the philosophy of Plotinus is his theory of emanation. Explain this theory.
*Komponent fundamentali fil-filosofija ta' Plotinu hi t-teorija tal-emanazzjoni. Fisser din it-teorija.*