

Ex./Phil/PG/4.5.5/90/2018

MASTER OF ARTS EXAMINATION, 2018

(2nd Year, 4th Semester)

PHILOSOPHY

[Logic - IV]

Full Marks : 30

Time : Two Hours

The figures in the margin indicate full marks.

1. Give recursive definition of the primitive formulas of ZF. 10

Or.

2. Discuss Russell's paradox in detail mentioning the significance of the axiom schema of abstraction. 10
3. Prove the following in ZF (any two) : 5×2=10

(i) $(\exists!c)(\forall x)(x \in C \leftrightarrow x \in A \ \& \ x \in B)$

(ii) $x \in A \cap B \leftrightarrow x \in A \ \& \ x \in B$

(iii) $A \cap A = A$

(iv) $\cup O = O$

[Turn over]

[2]

4. (i) State in primitive notation of ZF the axiom of extensionality and the axiom schema of separation. 2

(ii) Prove in ZF

$$A \subseteq O \rightarrow A = O$$

Or.

5. Define the following in ZF. 1×5

(i) Proper subset

(ii) Set

(iii) Intersection of the sets

(iv) Union of two sets

(v) Ordered pair.

6. Prove any *one* of the following in ZF.

(i) $A \subseteq B$ and $B \subseteq C \rightarrow A \subseteq C$ 5

(ii) $A \subseteq B$ and $B \subseteq A \rightarrow A = B$ 5