

Ex/Phil/PG/1.2/12/2017

MASTER OF ARTS EXAMINATION, 2017

(1st Year, 1st Semester)

PHILOSOPHY

[Logic (Western)]

Full Marks : 30

Time : Two Hours

Use a separate Answer-Script for each Part.

The figures in the margin indicate full marks.

Part - A

1. (a) Symbolize any *one* of the following : 2

(i) If a boy tells only lies, none of them will be believed.
(Bx : x is a boy, Lx : x is a lie, Txy : x tells y, Bxy : x believes y)

Or

(ii) Anyone who accomplishes anything will be envied by everyone. (Px : x is a person, Axy : x accomplishes y, Exy : x envies y).

(b) Prove that the following argument is invalid : 3

$(x)(\exists y)(Fx \equiv Gy)$
 $\therefore (\exists y)(x)(Fx \equiv Gy)$

[Turn over]

[2]

2. Prove that the following argument is valid (any *one*) : 5

- (i) All horses are animals. Therefore the head of a horse is the head of an animal. ($\text{Ex} : x$ is a horse, $\text{Ax} : x$ is an animal, $\text{Hxy} : x$ is the head of y)

Or

- (ii) $(\exists x)Jx \vee (\exists y)Ky$
 $(x)(Jx \supset Kx) / \therefore (\exists y)Ky$

3. Construct a demonstration for *either* of the following : 5

(i) $(\exists y)[(\exists x)Fx \supset Fy]$

(ii) $[(x)Fx \vee (x)Gx] \supset (x)(Fx \vee Gx)$

Or

4. Symbolise symmetrical, asymmetrical, transitive, intransitive and irreflexive relations. Give suitable examples to illustrate them. 5

[*Turn over*]

[3]

Group - B

5. Prove the following theories :

(a) If A and $A \supset B$ are both true for a given interpretation, then B is true for that interpretation.

(b) $A \models_p B$ iff $\models_p A \supset B$

(c) If $\Gamma \models_p A$, then $\Gamma \cup \Delta \models_p A$

(d) If $\Gamma \models_p A$, and $A \models_p B$, then $\Gamma \models_p B$.

$$2\frac{1}{2}+2\frac{1}{2}+2\frac{1}{2}+2\frac{1}{2}=10$$

Or

6. Prove that if $\Gamma, A \vdash_{PS} B$, then $\Gamma \vdash_{PS} A \supset B$ 10

7. State the axioms of System T. 5

Or

8. Prove the following theorems in system T : 5

(i) $p \supset Mp$

(ii) $(p \supset q) \supset (Mp \supset Mq)$