

M.A. Examination, 2016

Semester – I

Philosophy

Course- III

Logic (Western)

Time: 3 Hours

Full Marks: 40

Questions are of value as indicated in the margin.

Answer *any four* questions.

1. (i) Symbolize any four of the following : 4 x 2 = 8
- (a) If nothing is damaged, nobody will be blamed.
- (b) If any bananas are yellow, then if all yellow bananas are ripe, they are ripe.
- (c) If something is missing, then if nobody calls the police, it will not be recovered.
- (d) Any good amateur can beat some professional.
- (e) A lawyer who pleads his own case has a fool for a client.
- (ii) What is a relational predicate? Give one example. 2
2. (i) Construct a formal proof of validity for **any two** of the following: 4 x 2 = 8
- (a) $(\exists x)Lx \supset (y)My$
 $\therefore (x)[Lx \supset (y)My]$
- (b) $(x)(Qx \supset Rx)$
 $(x)(Sx \supset Tx)$
 $\therefore (x)(Rx \supset Sx) \supset (x)(Qy \supset Ty)$
- (c) $(\exists x)Ux \supset (y)[(Uy \vee Vy) \supset Wy]$
 $(\exists x)Ux \cdot (\exists x)Wx$
 $\therefore (\exists x)(Ux \cdot Wx)$
- (ii) Explain the distinction between an individual constant and an individual variable. 2
3. (a) Explain why the rule E.I. requires that the assumption for E.I. needs a variable which has no free occurrence earlier in the derivation.
- (b) State the rule E.I. and explain its application. 4+6=10

P.T.O.

(2)

4. (a) Test the validity of the following inference by using the tree method: 5

$$(\exists x)Jx \supset (\exists y)Ky$$

$$\therefore (\exists x)[Jx \supset (\exists y)Ky]$$

(b) Give a demonstration for the following: 5

$$(x)Fx \equiv \sim(\exists x)\sim Fx$$

5. Prove the invalidity of **any two** of the following: 2 x 5 = 10

(a) $(x)(\exists y)(Px \supset Qy)$

$$(y)(\exists z)(Ry \supset Qz)$$

$$\therefore (\exists x)(z)(Px \supset Rz)$$

(b) $(x)(\exists y)(Ex \supset Fy)$

$$(\exists y)(z)(Fy \supset \sim Gz)$$

$$\therefore (x)(z)(\sim Ex \supset Gz)$$

(c) $(x)(\exists y)(Hx \supset Iy)$

$$(\exists y)(z)(Iy \supset Jz)$$

$$\therefore (x)Hx \supset (z)Jz$$

6. Construct formal proofs of validity of the following: 2 x 5 = 10

(a) No acrobats are clumsy. Therefore, if Al is a waiter, then if all waiters are clumsy, Al is not an acrobat.

(b) All pets are gentle. Therefore, if any dogs are excitable and no excitable dogs are gentle, then they are not pets.
