B.A. (Honours) Examination, 2015
Semester – IV
Philosophy
Paper : H-8
Western Logic (Part-II)

Time: 3 Hours **Full Marks: 40**

Questions are of value as indicated in the margin.
Answer ***any four*** questions.

1. (a) Distinguish between argument and argument form. 4

   (b) Use truth-tables to determine the validity of the following: 3+3=6

   (i) $(A \lor B) \supset (C.D)$
   $\therefore B \supset (C.D)$

   (ii) If the market is down then the economy is sluggish. If the economy is sluggish then people are in distress. The market is down. Therefore the economy is not sluggish.

2. (a) What is a truth-functional statement? 2

   (b) Determine by truth-table whether the following are tautologies, or contradictions, or contingent statement forms. 4+4=8

   (i) $[(p.q) \supset \sim r] \supset [r \supset (\sim p \lor \sim q)]$

   (ii) $[p \lor (q \supset r)] \equiv [p \lor (q. \sim r)]$

3. (a) Distinguish between exclusive disjunction and inclusive disjunction. 4

   (b) Construct a formal proof of validity for each of the following: 3+3=6

   (i) $(S \lor \sim S) \supset T$
   $\therefore T$

   (ii) $(A \lor B) \supset (A.B)$
   $\sim (A \lor B)$
   $\therefore \sim (A.B)$

4. (a) State the rule of inference for the truth-functional connective 'v' as applied in the tree method. 2

   (b) Determine the validity of the following by using the tree method. 4+4=8

   (i) $(A.B) \equiv (C \lor D)$
   $\sim C. \sim A$
   $\therefore B \equiv D$

   (ii) $(P. \sim R) \supset Q$
   $(S \lor T) \supset P$
   $\therefore S \supset (\sim Q \supset R)$

P.T.O.

5. Construct formal proofs of validity for the following: 5+5=10

(a) $(\exists x)(Px . \sim Qx)$

$(x)(Px \supset Rx)$

$\therefore (\exists x)[Rx.(\sim Qx \vee Sx)]$

(b) $(x)(Ax \supset \sim Bx)$

$(\exists x)[Bx.(Cx.Dx)]$

$\therefore (\exists x)[(Cx.Dx). \sim Ax]$

6. (a) State and explain the rule for Existential Instantiation (E.I.) 5

(b) Prove the invalidity of the following: 5

$(x)(Ax \supset \sim Bx)$

$(\exists x)(Bx. \sim Cx)$

$\therefore (\exists x)(Ax. \sim Cx)$