

B.A. (Honours) Examination, 2017

Semester-IV

Philosophy

Course – 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) When is a statement tautological? Give an example of a tautological statement. 2
b) Determine by constructing truth-tables whether the following forms of statement are tautological, contradictory or contingent. 3×2
(i) $(p \supset q) \vee (q \supset p)$ (ii) $[p \supset (q \supset r)] \supset [r \supset (q \supset p)]$
(iii) $[p.(q \vee r)] \supset [\sim(p.q). \sim(p.r)]$
(c) What is meant by a contingent statement? 2
2. (a) Distinguish between a unary connective and binary connective. Give examples. 4
(b) Use the *reductio ad absurdum* (shatter truth-table technique) method to determine the validity or invalidity of the following arguments. 3+3
(i) $A \supset (B.C)$ (ii) $(A.B) \supset (C.D)$
 $C \supset (D \vee E)$ $(A. \sim B) \supset (\sim C.D)$
 $\therefore A \supset (D \vee E)$ $\therefore A \equiv D$
3. (a) What is the difference between Rules of Inference and Rules of Replacement? Explain. 4
(b) Construct a formal proof of validity for each of the following: 3+3
(i) A (ii) $(A. \sim B) \supset C$
 $\therefore B \vee \sim B$ $\sim(B \vee C)$
 $\therefore \sim A$
4. (a) State and explain the strengthened Rule of conditional proof. 4
(b) Use the strengthened Rule of conditional proof to verify that the following is a tautology: 3
 $[A \supset (B \supset C)] \supset [(A \supset B) \supset (A \supset C)]$
(c) Use Indirect Proof to show that the following is a tautology: 3
 $A \supset (B \supset (A.B))$
5. (a) What are the two qualifiers? Explain the difference between them. 4
(b) Construct a formal proof of validity for each of the following: 3+3
(i) $(x)(Ax \supset Bx)$ (ii) $(x)(Px \supset \sim Qx)$
 $(\exists x)(Cx.Ax)$ $(\exists x)(Px.Rx)$
 $\therefore (\exists x)(Cx.Bx)$ $\therefore (\exists x)(Rx. \sim Qx)$
6. (a) State and explain the Rule of Existential Instantiation and the restrictions, if any, on it. 5
(b) Construct a formal proof of validity for the following argument: 5
No philosophers are rich persons. All poets are philosophers. Therefore, no poets are rich persons.