63/1 (SEM–4) PHL HC 4106 (CC 10)

2022

PHILOSOPHY

Paper : CC–10

(Truth Functional Logic : Propositional and Predicate)

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Choose the correct answer : 1×6=6

(a) Development form of traditional logic is known as

(i) classical logic

(ii) deductive logic

(iii) modern logic

(iv) inductive logic

(b) There are _____ types of logical constant.

(i) 2

(ii) 3

(iii) 4

(iv) 5

(c) In rules of replacement, there are ____ rules.

(i) 9

(ii) 10

(iii) 11

(iv) 12

(d) '(x)' is known as

(i) universal quantifier

(ii) existential quantifier

(iii) bound variable

(iv) propositional function

(e) "All crows are black." The proposition is

(i) universal affirmative

(ii) universal negative

(iii) particular affirmative

(iv) particular negative

(f) '$p \supset q \equiv \sim q \supset \sim p$' is known as

(i) material implication

(ii) exportation

(iii) transposition

(iv) equivalence

2. Answer the following in brief : 2×5=10

(a) What is truth table?

(b) What are free and bound variables?

(c) What are the three logical connectives?

(d) Symbolize the proposition by using quantifier :

"All grass snakes are harmless."

(e) What is truth tree?

3. Answer any *six* of the following questions : 5×6=30

(a) Explain the nature of logic.

(b) What do you mean by interdefinability of logical connectives?

(c) What are tautology and contradictory expressions? Give example with truth table.

(d) Construct a formal proof of validity for the following argument form :

$$P \supset Q$$
$$\sim Q \vee R \,/\, \therefore \sim R \supset \sim P$$

(e) What do you mean by conditional proof? Explain.

(f) Explain the rules of indirect proof of validity with example.

(g) Write a short note on existential quantifier.

(h) Mention the rules of quantification.

(i) Prove invalidity of the following argument :

$$A \supset B$$
$$B \supset C$$
$$\therefore C \supset A$$

4. Answer any *two* of the following questions : 10×2=20

(a) Discuss shorter truth table method to prove the validity of argument. 10

(b) What is conjunctive normal form? Discuss with example. 2+8=10

(c) What is formal proof of validity? Discuss the method to construct a formal proof of validity. 2+8=10

5. Answer elaborately any *one* of the following : 14

(a) What is truth function? Explain with the help of truth table. 2+12=14

(b) What is quantification? Discuss universal and existential quantification with example. 2+12=14

★★★