63 (FY) SEM–3/MAJ/PHLMAJ2024

2024

PHILOSOPHY

Paper : PHLMAJ2024

(Formal Logic)

Full Marks : 70

Pass Marks : 28

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer : 1×6=6

   (a) Who is the pioneer of the concept of set ?

   (i) Gottlob Frege

   (ii) George Cantor

   (iii) George Boole

   (iv) Patrick Suppes

(b) The word *validity* and *invalidity* are related to—

(i) Proposition

(ii) Argument

(iii) Sentence

(iv) Term

(c) $P \supset Q \equiv \sim Q \supset \sim P$ what is the name of this rule ?

(i) Transposition

(ii) Double Negation

(iii) Equivalence

(iv) Tautology

(d) Under what condition, a conjunctive function becomes true ?

(i) If both P and q are true

(ii) If both P and q are false

(iii) If P is true and q is false

(iv) If P is false and q is true

(e) How many 'rules of replacement' are there ?

(i) Eight

(ii) seven

(iii) nine

(iv) ten

(f) What symbol is used for Universal Quantification ?

(i) (x)

(ii) $(\exists x)$

(iii) $(Z\, x)$

(iv) (xa)

2. Answer the following questions : ***(any five)*** 2×5=10

(a) Define variables.

(b) What is Truth function ?

(c) What do you mean by Argument form ?

(d) What is empty or null set ?

(e) Define Quantification.

(f) State two usages of truth table method.

(g) What are the Logical Constants ?

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

(a) Explain and illustrate the concept of 'difference of set'.

(b) What is shorter truth table method ?

(c) Construct truth tables for an implicative and disjunctive function.

(d) Make a difference between SubSet and SuperSet.

(e) Describe the different types of General Proposition.

(f) Symbolize the following statements by using Quantifier :

(i) Some men are honest.

(ii) Everything is movable.

(iii) All mangoes are sweet.

(iv) No philosophers are Scientists.

(v) Some men are not intelligent.

(g) Write short notes on Propositional variable.

(h) Explain the relation between truth and validity.

(i) Name *any five* rules of inference.

4. Answer the following questions : ***(any two)*** 12×2=24

(a) Construct formal Proof of Validity of the following: 4+4+4=12

(i) 1. $(AVG) \supset S$

2. $A.T / \therefore S$

(ii) 1. $(MVL) \supset K$

2. $(K V J) \supset I$

3. JVM

4. $\sim J / \therefore I$

(iii) 1. $E \supset (F \cdot \sim G)$

2. $(FVG) \supset H$

3. $E / \therefore H$

(b) What is Quantification ? Explain universal and existential Quantifiers with suitable example.

(c) What are the basic truth function ? Explain conjunctive, Implicative and biconditional (equivalent) function with truth tables.

(d) Construct truth tables for the following compound expressions and determine whether they are tautologous, contradictory or contingent ? 4+4+4=12

(i) $(P \vee q) \cdot \sim (P \supset q)$

(ii) $\sim (P \vee \sim P)$

(iii) $(P \supset q) \cdot \sim (P \equiv q)$