2012

PHILOSOPHY

(Major)

Paper : 2.1

(Logic—II)

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following questions : 1×10=10

(a) Is shorter truth table method a decision procedure?

(b) $p \supset q$
$\sim p$
$\therefore \sim q$
Is it valid?

(c) How many sets of rules are applied in the formal proof of validity?

(d) Choose the correct answer :
Quantification belongs to propositional logic / predicate logic.

(e) Fill up the following blank :

The symbol —— is used for universal quantification.

(f) How many valid moods are there in the first figure?

(g) What is the fallacy of exclusive premises?

(h) Symbolize the following proposition in the notation of predicate logic :

Sita is pure.

(i) What is the sign for existential quantifier?

(j) Diagrammatically represent the second figure of categorical syllogism.

2. Answer the following : 2×5=1

(a) Symbolize the following proposition using quantifiers :

Everything is movable.

(b) State the meaning of 'reductio ad absurdum'.

(c) State two uses of Venn diagram.

(d) What is truth-value?

(e) What is the meaning of Modus Ponens (MP)? What is its symbolic form?

3. Give short answers for the following questions (any *five*) : 4×5=20

   (a) What is propositional function?

   (b) State the difference between propositional logic and predicate logic.

   (c) Distinguish between singular proposition and general proposition.

   (d) Write short notes on quantifiers.

   (e) Name the valid moods of the fourth figure.

   (f) Name any four rules of the method of deduction.

4. What is indirect truth table method? Explain the process of the application of indirect truth-table method with a suitable example. 5+5=10

   Or

   Construct indirect truth table to determine the validity or invalidity of the following forms of argument : 5×2=10

   (a) If x is an even number, then x is divisible by 2.

   x is not divisible by 2.

   $\therefore$ x is not an even number.

(b) If you finish the job by Friday, then you get the bonus.

You do not finish the job by Friday.

$\therefore$ You do not get the bonus.

5. Construct a formal proof of validity for the following arguments : 5×2=10

(a) 1. $F \vee (G \vee H)$
2. $(G \supset I) \cdot (H \supset J)$
3. $(I \vee J) \supset (F \vee H)$
4. $\sim F / \therefore H$

(b) 1. $(M \supset N) \cdot (O \supset P)$
2. $M \vee O$
3. $(N \vee P) \supset (\sim B \vee \sim D)$
4. $(G \supset B) \cdot (H \supset D)$
5. $\sim\sim G$
6. $(K \cdot L) \supset H / \therefore \sim (K \cdot L)$

Or

What is the formal proof of validity? Describe the strategies for constructing formal proof of validity. 10

6. Describe the standard form of categorical syllogism with particular reference to its structure, figure and moods. 3+3+4=10

Or

Prove the validity or invalidity of the following syllogistic arguments with the help of Venn diagram : 5×2=10

(a) All great scientists are college graduates.
Some professional atheletes are college graduates.
∴ Some professional atheletes are great scientists.

(b) All dogs are mammals.
All cats are mammals.
∴ All cats are dogs.

7. Explain how traditional *A*, *E*, *I* and *O* propositions are symbolised with the help of quantifiers. 10

Or

What is quantification? Explain the rules of quantification. 2+8=10

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