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PHILOSOPHY

(Major)

Paper : 2.1

(Logic)

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) Can rules of inference be applied to a part of a proof?

   (b) How many truth values does a proposition can have?

   (c) Fill up the blank :

   If a disjunction is true, but its first disjunct is not true, then the second disjunct must be ——.

(*Turn Over*)

(d) State the rule of Modus Tollens (MT).

(e) Is the rule of hypothetical syllogism a rule of inference/rule of replacement? Find out the correct answer.

(f) "Formal proof of validity can prove the invalidity of an argument." Is this statement true?

(g) State the name of one valid mood of fourth figure.

(h) Name the following rule of formal proof of validity :

$$p \supset q \equiv \sim q \supset \sim p$$

(i) Predicate logic is concerned with the internal structure of simple proposition/ compound proposition/both. Find out the correct answer.

(j) Name the logician after whose name Venn diagrams are associated.

2. Answer the following questions in brief :

$$2 \times 5 = 10$$

(a) Symbolize the following proposition in the notation of predicate logic :
Everything is temporary.

(b) Explain the meaning of the phrase 'reductio ad absurdum'.

(c) State two features of syllogistic inference.

(d) State the rule of material implication.

(e) What are the two sets of rules of formal proof of validity?

3. Give short answer for the following questions (any *four*) :

$$5 \times 4 = 20$$

(a) State the logical names of the rules of replacement with their logical form.

(b) What is propositional logic? In what way is it distinguished from predicate logic?

(c) Symbolize the traditional A, E, I and O proposition through Venn diagram.

(d) Write a short note on conditional proof.

(e) What is propositional function? State one difference between proposition and propositional function.

4. What is indirect truth table method? Explain the strategy of constructing and indirect truth table method with a suitable example.

2+8=10

Or

Construct indirect truth table and determine the validity or invalidity of the following forms of argument :   5+5=10

(a) $p \supset q$

$q \supset r$

$\therefore p \supset r$

(b) $(p \supset q) \cdot (r \supset s)$

$\sim q \vee \sim s$

$\therefore \sim p \vee \sim r$

5. What is formal proof of validity? Describe the strategies for constructing formal proof of validity.   2+8=10

Or

Construct a formal proof of validity for the following arguments :   5+5=10

(a) $A \vee \sim I$

$D \supset I$

$\sim A$

$(\sim D \cdot \sim I) \supset W / \therefore W$

(b) $N \supset O / \therefore (N \cdot P) \supset O$

6. Define categorical syllogism and analyze its features.   2+8=10

Or

Test the following syllogistic arguments with the help of Venn diagram :   5+5=10

(a) All animals are four-legged animals.

All cats are four-legged animals.

∴ All cats are elephants.

(b) All great leaders are intelligent.

Some politicians are intelligent.

∴ Some politicians are great leaders.

7. What is predicate logic? Explain the process of quantification of the traditional *A, E, I* and *O* propositions.   2+8=10

Or

Prove the validity of the following arguments with the help of predicate logic :   5+5=10

(a) All king are wise.

All rulers are kings.

∴ All rulers are wise.

(b) No politicians are reliable.

Mr. John is reliable.

∴ Mr. John is not a politician.

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