

2016

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 : $1 \times 10 = 10$

(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 —.

- (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 :

2×5=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) : 5×4=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.
