

**2016**

**M.A.**

**1st Semester Examination**

**PHILOSOPHY**

**PAPER—PHI-102**

*Full Marks : 40*

*Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

**(Western Logic)**

**UNIT—I**

**Group—A**

Answer any one question.

1. (a) Answer the following questions (any four) : 4×2
- (i) Distinguish between truth function and propositional function with examples.
  - (ii) What, according to Copo, are the two definite conventions governing the expressions ' $\phi$  lc' and ' $\phi$  v'?

*(Turn Over)*

(iii) Identify the mistake in the following erroneous proof.

$$1. (\exists x) (Fx \cdot Gx) \therefore (x) Fx$$

$$\rightarrow 2. Fx \cdot Gy$$

$$3. Fx \text{ --- } 2, \text{ simp.}$$

$$4. Fx \text{ --- } 1, 2-3 \text{ EI}$$

$$5. (x) Fx \text{ --- } 4. \text{UG.}$$

(iv) Explain with illustrations 'QN' rule.

(v) State the rule of Existential Instantiation (EI).

(b) Symbolize the following propositions using quantifies, variables etc. : (any four) 4×2

(i) If every position has a future and no employees are lazy, then some employees will be successful.

(Px : x is a position, Fx : x has a future, Ex : x is an employee, Lx : x is Lazy, Sx : x will be successful.)

(ii) If some officers are present, then if all officers present are captains, they are captains.

(Ox : x is an officer, Px : x is present, Cx : x is Captain).

(iii) If something is damaged, but nobody is blamed, the tenant will not be charge for it.

(Dx : x is damaged, Px : x is a person, Bx : x is blamed, Cx : x will be charged to tenant).

(iv) If something has mass then it has velocity.

(Mx : Vx)

2. (a) Construct formal proof of validity for the following arguments : (any two) 2×4

(i)  $(\exists x) Jx \cup (\exists y) Ky, (x) (Jx \supset Kx) \therefore (\exists y) Ky$

(ii)  $(x) (\exists y) (Kx \supset Ly)$   
 $\therefore / (\exists y) (x) (Kx \cdot Ly)$

- (iii) All pets are gentle. Therefore, if any dogs are excitable and no excitable dogs are gentle, they are not pets.

- (iv) All radioactive substances either have a very short life or have medical value. No uranium isotope that is radioactive has a very short life. Therefore, if all uranium isotopes are radioactive, then all uranium isotopes have medical value.

(Rx : x is radioactive, Sx : x has very short life, Mx : x had medical value, Ux : x is a uranium isotope.)

- (b) Prove the invalidity of the following arguments : 2×4

(i)  $(x) (\exists y) (Fx \equiv Gy) \therefore (\exists y) (x) (Fx \equiv Gy)$

(ii)  $(x) Nx \supset (\exists y) Oy$

$(y) Oy \supset (\exists z) Pz \therefore (\exists x) Nx \supset (z) Pz$

### Group—B

Answer any one question :

1×4

3. Construct a demonstration for the following :

$$(\exists y) [Fy \supset (x) Fx]$$

Or

$$(x) Fx \supset \sim (\exists x) \sim Fx$$

4. Identify and explain the mistakes in the following erroneous "proof" : 4

1.  $(y) (\exists x) (Fx \cup Gy)^2 \therefore (\exists x) (y) (Fx \cup Fx)$
2.  $(\exists x) (Fx \cup Gy)$  1, uI
3.  $Fx \cup Gx$
4.  $(y) (Fx \cup Gy)$  3, uG
5.  $(\exists x) (y) (Fx \cup Gy)$  4, E-G
6.  $(\exists x) (y) (Fx \cup Gy)$  2, S — S EI.

## UNIT—II

### Group—A

Answer any one question.

5. Answer the following questions :
- (a) Explain the *principle of extentionality for sets*. 4
  - (b) Which of the following statements are true for all sets A, B and C? 4 × 1  $\frac{1}{2}$ 
    - (i) If  $A \in B$  and  $B \subset C$ , then  $A \subset C$
    - (ii) If  $A \subseteq B$  and  $B \in C$ , then  $A \in C$
    - (iii) If  $A = B$  and  $B \in C$ , then  $A \in C$
    - (iv) If  $A \subset B$  and  $B \subseteq C$ , then  $A \subset C$

- (c) (i) Can the members of a set be themselves sets?  
 (ii) Can a set be a member of itself?  
 Give reasons for your answers. 2+2
- (d) Explain the properties of the relation of inclusion. 2

6. Answer the following questions :

- (a) Prove that the empty set is a subset of every set. 4
- (b) Answer the following questions : 3
- (i) What do you mean by intersection of sets?  
 (ii) What do you mean by union of sets?  
 (iii) What do you mean by difference of sets?
- (c) Find the following : 3
- (i)  $\{\Lambda, \{\Lambda\}\} \sim \Lambda$
- (ii)  $\{\Lambda, \{\Lambda\}\} \sim \{\{\Lambda\}\}$
- (iii)  $\Lambda \cap \{\Lambda\}$
- (d) If  $V = \{1, 2, 3, 4, 5\}$   
 $A = \{1, 2\}$   
 $B = \{2, 3\}$
- What is the following?
- (i)  $\sim A \sim B$   
 (ii)  $A \sim B$  2

- (e) Test the validity of the following argument by Venn diagrams.

State in terms of regions of the diagram why the argument is valid or invalid :

Only salesman are retailers. Not all retailers are travellers. Therefore, some salesmen are not travellers.

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### Group—B

Answer any *one* question.

7. Translate the following statements into set-theoretic notation : 4×1

- (i) Planets are nine.
- (ii) No Frenchmen is an American.
- (iii) People who drink wine and coffee also drink tea.
- (iv) Some American wine-drinkers are philosophers.

8. Are the following assumptions mutually consistent? 4

All A are C

No A are C

Some A are B