

BACHELOR OF ARTS EXAMINATION, 2022

(2nd Year, 4th Semester)

PHILOSOPHY

[LOGIC (WESTERN-II)]

Time : Two Hours

Full Marks : 30

Group – A

1. Construct a formal proof of validity of the following:

নিম্নলিখিত যুক্তিগুলির বৈধতার আকারগত প্রমাণ প্রদান কর।

5+5=10

- a) No businessmen are not wealthy. There are no wealthy poets. Therefore, businessmen are never poets. (Bx, Wx, Px)

b) $(x)[(Ax \vee Bx) \supset (Cx \cdot Dx)]$

$\therefore (x)(Bx \supset Cx)$

Or

2. Prove the invalidity of the following:

নিম্নলিখিত যুক্তিগুলির অবৈধতা প্রমাণ কর :

5+5=10

a) $(O \cdot P) \supset (Q \supset R)$

$S \supset \sim R$

$\sim (P \supset \sim S)$

$\sim (O \supset Q)$

$\therefore \sim O$

[Turn over

[2]

- b) If Liverpool wins then Tottenham will lose. If Chelsea wins then Everton will lose. Either Liverpool will win or Everton will lose. Therefore Either Tottenham will lose or Chelsea will win.

3. Symbolize the following sentences:

নিম্নলিখিত বাক্যসমূহের সাক্ষেতিক আকার প্রদান কর।

- a) Sparrows are not humans
b) Few cricketers are footballers
c) Only citizens are allowed to have an Aadhar Card
d) A child is crying
e) Tendulkar is not a citizen of Australia

Or

4. Prove: প্রমাণ কর। 5

- a) $\sim(x)[\sim(Sx \cdot \sim Tx)] \equiv (\exists x)(Sx \cdot \sim Tx)$
b) $\sim(\exists x)[\sim(\sim Mx \vee \sim Nx)] \equiv (x)(Mx \supset \sim Nx)$

Group – B

Answer **any one** question from the following :

নিম্নলিখিত প্রশ্নগুলির মধ্যে থেকে যে কোন একটি প্রশ্নের উত্তর দাও :

1. i) Prove that the following statements are true for all sets A, B, and C)
a) If $A \subseteq B$ and $B \subseteq C$, then $A \subseteq C$. 5
b) If $A \in B$ and $B \subset C$, then $A \in C$. 5

[3]

- ii) Test the validity of the following arguments by using the Method of Venn Diagram. 5

$$\begin{aligned} A \cap B &\subseteq \sim D \\ A \cup D &\subseteq B \\ \therefore A \cap D &= \Lambda \end{aligned}$$

2. i) If it is given that $A \subseteq B$ and that $C \cap \sim B \neq \Lambda$, what relation can be concluded to hold between A and C? 4

- ii) Symbolize the following statement: 2
Fools and drunk men are truth tellers.

- iii) Are the following assumptions mutually consistent?

$$\begin{aligned} C &\neq \Lambda \\ A \cap B &\neq \Lambda \\ A \cap C &= \Lambda \\ (A \cap B) \sim C &= \Lambda \end{aligned} \quad 9$$