2022

1st Semester Examination

PHILOSOPHY

Paper : PHI 102

(Western Logic)

Full Marks : 40 Time : Two Hours

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

Group - A

Answer any ***four*** out of the following questions : 5×4=20

1. State the rules for conjunction and rules for disjunction (with suitable examples) after the method of Resolution. 5

2. Suppose A is True, B is False, X is False, Y is false, P and Q are unknown. Determine the truth value of the following sentences. 2½+2½

   (a) $(P \bullet \sim P. A) (P \vee Q \vee B)$

   (b) $[(A \bullet X) \supset Q] \equiv [A \supset (X \supset Q)]$

P.T.O.

3. (a) State the rules of inference of any two truth-functional connectives after Jeffrey's Truth Tree.

   (b) Determine the validity of the following statement using Truth Tree.

   $A \leftrightarrow B, A \vee B / \therefore A \,\&\, B$ 2+3

4. Write down two definite conventions governing the expressions '$\Phi\mu$' and '$\Phi\nu$'. 2½+2½

5. Explain the final version of UG 5

6. Identify and explain the mistakes in the following erroneous proof.

   1. $(\exists x)(y)[Fx.Gx) \supset Hy] / \therefore (\exists x)[(Fx.Gx) \supset Hx]$
   2. $(y)[(Fz.Gz) \supset Hy]$
   3. $(Fz.Gz) \supset Hy - 2, UI$
   4. $(\exists x)[(Fx.Gz) \supset Hy] - 3, EG$
   5. $(y)(\exists x)[(Fx.Gy) \supset Hy] - 4, UG$
   6. $(y)(\exists x)[(Fx.Gy) \supset Hy] - 1,2 - 5, EI$
   7. $(\exists x)[(Fx.Gy) \supset Hy] - 6, UI$ 2½+2½

Group - B

Answer any *two* out of the following questions : 10×2=20

7. State and explain the *Reductio Ad Absurdum* Method in your own words. 10

8. (a) Determine whether the following argument is valid.

$(A \vee B) \supset (A \bullet B), \sim (A \vee B) / \therefore \sim (A \bullet B)$

(b) Determine whether the following statements are equivalent.

(i) $(P \supset Q) \supset R, P \supset (Q \supset R)$

(ii) $(A \bullet B) \vee (A \bullet C) \vee (B \bullet C), (A \vee B) \bullet (A \vee C) \bullet (B \vee C)$ 4+(3+3)

9. (a) What is validity?

(b) Prove the validity of the following :

(i) 1. $(\exists x) Xx \supset (y)(Yy \supset Zy) /$

$\therefore (\exists x)(Xx.Yx) \supset (\exists y)(Xy.Zy)$

(ii) 1. $(x)(\exists y)(Kx.Ly) / (\exists y)(x)(Kx.Ly)$ 2+(4+4)

10. (a) What is invalidity?

(b) Prove the invalidity of the following :

(i) 1. $(x)(\exists y)(Ex \supset Fy)$

2. $(\exists y)(z)(Fy \supset \sim Gz) / \therefore (x)(z)(Ex \supset \sim Gz)$

(ii) 1. $(\exists x)(\exists y)(Yx \supset Zy)$

2. $(\exists y)(z)(Zy \supset Az) / \therefore (\exists x) Yx \supset (z)Az$ 2+(4+4)
