M.A. Examination, 2014

Semester – I

Philosophy

Paper : III

Logic (Western)

Time: 3 Hours **Full Marks: 40**

Questions are of value as indicated in the margin.

Answer ***any four*** questions

1. (a) Symbolize the following (any four): 4×2=8

   (i) If something is damaged then somebody will be blamed.

   (ii) If anything is damaged, if will be repaired.

   (iii) If any banana is yellow, and all yellow bananas are ripe then it is ripe.

   (iv) If any employees are lazy, then if some positions have no future, then they will not be successful.

   (v) If there are any participants and only women are participants, then they are women.

   (vi) If all officers present are either captains or majors, then either some captains are present or some majors are present.

   (b) When is an individual variable free in a propositional function? 2

2. (a) What is a multiply-general proposition? Give an example. 2

   (b) Construct a formal proof of validity for any two of the following: 2×4=8

   (i) $(\exists x)\, Ux \supset (y)\big[(Uy \vee Vy) \supset Wy\big]$; $(\exists x)\, Ux.(\exists x)Wx$

   $\therefore (\exists x)(Ux.\, Wx)$

   (ii) $(\exists x)\, Ax \supset (y)(By \supset Cy)$

   $(\exists x)\, Dx \supset (\exists y)\, By$

   $\therefore (\exists x)(Ax.\, Dx) \supset (\exists y)\, Cy$

   (iii) $(x)(Lx \supset Mx)$

   $(x)(Mx \supset Nx)$

   $\therefore (\exists x)\, Lx \supset (\exists y)\, Ny$

P.T.O.

3. Construct demonstrations for each of the following (***any two***): 2×5=10

   (i) $(x)(Fx \supset Gx) \supset [(x)Fx \supset (x)Gx]$

   (ii) $[(\exists x)Fx \supset (\exists x)Gx] \supset (x)[Fx \supset (\exists x)Gx]$

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

4. Test the validity of the following by the tree method (***any two***): 2×5=10

   (i) $(\exists x)[Mx.(y)(My \supset Dyx)]$
   $\therefore (\exists x)(Mx.Dxx)$

   (ii) $(x)[Ax \supset (y)(By \supset Cy)]$
   $\therefore (x)Ax \supset (y)(By \supset Cy)$

   (iii) $(\exists x)Fx \supset (\exists y)Gy$
   $\therefore (x)Fx \supset (y)Gy$

5. (a) Prove the invalidity of ***any one*** of the following: 5

   (i) $(\exists x)(y)(Fx \supset \sim Gy)$
   $(z)(\exists y)(Ez \supset Fy)$
   $\therefore (x)(z)(\sim Ex \supset Gz)$

   (ii) $(\exists x)(y)(Ax \supset By)$
   $(y)(\exists z)(By \supset Cz)$
   $\therefore (x)(\exists z)(Ax \supset Cz)$

   (b) State the rule QN. Illustrate the rule QN with the help of an example. 5

6. (a) State the rule UG. Explain the restrictions on it. 5

   (b) State the rule EI. Explain the restrictions on it. 5
