UNIT-V

9. Prove the invalidity of each of the following by quantification method. 4+4+4+2

(i)
(x) (Ex>Fx)
(x) (Gx>Fx)
∴ (x) (Ex>Gx)

(ii)
(Jx) (Ax.Bx)
Ac
∴ Bc

(iii)
(Jx) (Kx.Lx)
(Jx) (~Kx.~Lx)
∴ (Jx) (Lx.~Kx)

(iv)
(Jx) (Dx.Px)
(Jx) (Dx.Sx)
∴ (Jx) (Px.Sx)

10. Translate the following sentences into the logical rotation of propositional functions and quantifiers. 7x2=14

(i) Radhakrishnan is a philosopher.

(ii) None but the brave deserve the honour.

(iii) Bees and wasps sting if they are either energy or frightened.

(iv) Ghosts exist.

(v) Some horses are gentle and have been well trained.

(vi) Fruits and vegetables are wholesome and nourishing.

(vii) No coat is waterproof, unless it has been specially treated.

*****

PG Odd Semester Examination, 2022

PHILOSOPHY

(1st Semester)

Course No.: PHICC-504

(Symbolic Logic)

Full Marks: 70
Pass Marks: 28

Time: 3 hours

The figures in the right margin indicate full marks for the question.
Answer any five questions, taking one from each unit.

UNIT-I

1. (a) Use truth tables to determine validity or invalidity of the following arguments. 3x3=9

(i)
p v (q.p)
p
∴~(q.~p)

(ii)
p > (q.r)
∴ ~(q.r)> ~p

(iii)
KvL
K
∴ ~L

(b) Distinguish between a valid and a sound argument. Use suitable examples. 5

2. (a) Explain are inclusive and exclusive meanings of disjunction. 5

(b) Use truth-tables to decide which of the following are logical equivalances. 3x3=9

(i) ~(p.q) ≡ (~pv~q)

(ii) p ≡ [p.(q>p)]

(iii) [p.(qvr)] ≡ [(p.q) v (p.~r)]

UNIT-II

3. (a) Write all the 19 rules of formal proof (rules of inference and replacement). 5

(b) Use truth tables to characterise the following statement forms as tautologies contradictory or contingent. 3x3=9

(i) [(p>q)>q] >q

(ii) (p>~p).(~p>p)

(iii) (p.q)>p

4. Construct a formal proof of validity for each of the following arguments. 4+4+4+2

(i)
O>(P>Q)
P>(Q>R)
∴ O>(P>R)

(ii)
E>F
G>F
∴ (EvG)>F

(iii)
E>(F.~G)
(FvG)>H
E
∴ H

(iv)
K>L
∴ K>(LvM)

(v)
(QvR)>S
∴ Q>S

UNIT-III

6. Prove the invalidity of the following arguments by the method of assigning truth values. 4+4+4+2

(i)
X ≡ (Y>Z)
Y ≡ (~X.~Z)
Z ≡ (Xv~Y)
Y
∴ XvZ

(ii)
A>~B
(B.C)vA
∴ ~B

(iii)
~AvB
C>A
~BvC
∴ ~(B.A)

(iv)
~(E.F)
(~E.~F)>(G.H)
H>G
∴ G

(iv)
A>B
C>D
BvC
∴ AvD

6. For each of the following, construct both a formal proof of validity and an indirect proof (I.P.) 7+7

(i)
(V>~W).(X>Y)
(~W>Z).(Y>~A)
(Z>~B).(~A>C)
V.X
∴ ~B.C

(ii)
(H>I).(J>K)
(IvK)>L
~L
∴ ~(HvJ)

UNIT-IV

7. Use the method of conditional proof to verify that the following are tautologies. 4+4+4+2

(i) (P>Q)>[~(Q.R)>~(R.P)]

(ii) (A>B)>[A>(A.B)]

(iii)
(AvB)>[(CvE)>(~P.V)]
(~Pv~N)>U
∴ A>(C>U)

(iv) P>~~P

8. Use the method of indirect proof that the following are tautologies. 4+4+4+2

(i) ~[(A>~A).(~A>A)]

(ii) A ≡ [A.(AvB)]

(iii) (A>B)v(~A>B)

(iv) P ≡ ~~P