PG Odd Semester Examination, 2022

PHILOSOPHY

(1st Semester)

Course No.: PHICC-103

(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) "There is a connection between the validity or invalidity of an agrument and the truth or falsehood of its premises and conclusion." Explain with suitable examples. 4

(b) Symbolize the following statements :

(i) Both Amherst and Colgate win theiir games only if Dartmouth does not win its first game. 2

(ii) It is not the case that both A and B go to college. 2

(iii) If either Iran raises the price of oil or Iran does not raise the price of the oil, then America will be in trouble. Therefore, America will be in trouble. 2

(i) Either Atlanta wins their confernece championship and Balthimore wins their

conference championship or Chicago wins the super bowl. 2

(b) If the seed catalog is correct, then if the seeds are planted in April, then the flowers bloom in July. The flowers bloom in July. Therefore, if the seed catalog is correct, then it seeds are planted in April. 2

2. (a) Use truth table to determine the validity or invalidity of each of the following arguments : 10+4=14

(i) KVL 2
K
∴ ~L

(ii) p>(q.r) 2
∴ ~(q.r)>~p

(iii) E>(F.G0 2
∴ ~(F.G)>~E

(iv) p>q 2
∴ ~q>~p

(v) H 2
I
∴ H.T

(b) What do you understand by logic? What are the uses of symbolic logic? 4

UNIT-II

3. (a) Construct a formal proof of validity for each of the following arguments. 3x3=9

(i) E>F
G>F
/ ∴ (EvG)>F

(ii) A>B
/ ∴ A>(A.B)

(iii) E>S
E>(S>N)
S>(N>F)
/ ∴ E<F

10. Prove the invalidity of the following arguments by the method of assigning truth values : 4+5+5=14

(i) A>B
C>D
BvC
/ ∴ AvD

(ii) ~(E.F)
(~E.~F)>(G.H)
H>G
/ ∴ G

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

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(ii) S>(T.U)
(TvU)>V
/ ∴ S>V

(iv) (OvP)>(QvR)
PvD
/ ∴ QvR

(b) Write all the 19 rules of inference and replacement. 5

4. Use truth table to characterize the following statement forms at tautologous, contradictory or contigent : 4+5+5=14

(i) (p.q)>q

(ii) p>(p.q)

(iii) (~p.q).(q.p)

UNIT-III

5. Use the method of conditional proof to verify that the following are tautologies : 5+4+5=14

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

(ii) ~~p>p

(iii) [(A>B)>B] > (AvB)

6. Use the method of Indirect proof to verify that the following are tautologies :

(i) (A>B) v (~A>C)

(ii) A v (A>B)

(iii) (A>B) v (B>C) 5+5+4=14

UNIT-IV

7. Construct an indirect proof of validity for the following arguments : 5+5+4=14

(i) H>(A>B)
~C>(HvB)
H>A)
/ ∴ CvB

(ii) A
∴ Bv(B>C)

(iii) Av(B.C)
A>C
∴ C

8. For each of the following arguments, construct both a formal proof of validity and an indirect proof and compare their lengths : 5+4+5=14

(i) (MvN) > (O.P)
(OvQ) > (~R.S)
(RvT) > (M.U)
∴ ~R

(ii) (H>I).(J>K)
(IvK)>L
~L
∴ ~(HvJ)

(iii) (DvE) > (F>G)
(~GvH) > (D.F)
∴ G

UNIT-V

9. Construct a conditional proof of validity for the following arguments : 5+4+5=14

(i) (AvB) > (C.D)
(DvE) > F
/ ∴ A>F