557

This question paper contains 4 printed pages.

Your Roll No. .....

UNIQUE PAPER CODE	:	210276 (IN LIEU OF MIL)
NAME OF PAPER	:	LOGICAL REASONING : PROPOSITIONAL & PREDICATE LOGIC-SYMBOLIZATION
NAME OF THE COURSE	:	B.A. (PROG.) (PHILOSOPHY)
SEMESTER	:	II
Duration	:	**3 Hours**
Maximum Marks	:	75

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Instruction for Candidates

Write your Roll No. on the top immediately on receipt of this question paper.

Attempt all questions.

1. State which of the following are true or false: (**any five**) **2x5=10**

(i) A proposition that is false under every interpretation is called a contingent proposition.

(ii) If the antecedent is true and consequence is false, the material implication will be false.

(iii) A bi-conditional is a conjunction of two conditionals.

(iv) Reductio ad absurdum is another name for shorter truth table method.

(v) A stroke function is just the opposite of a conjunctive function.

(vi) 'p ⊃ q' is equivalent to '~ p v q'.

(vii) The negation of a false statement is true.

2. Use truth table method to determine whether the following are tautologous, self-contradictory or contingent. (**any two**) **2x5=10**

(i) $q \supset [p \cdot (q \vee p)]$

(ii) $(p \supset q) \supset [(p \cdot q) \vee (p \cdot q)]$

(iii) $[(p \supset q) \vee (q \supset r)] \supset (p \vee r)$

3. Use the shorter truth table method to prove the validity/invalidity of **any *two*** of the following: **2x5=10**

(i) $(p \supset q) \supset r$
$r \ / \therefore p \vee q$

(ii) $p \supset q$
$q \supset r \ / \therefore p \vee r$

(iii) $p \supset (q \supset r)$

$r \supset q \ / \therefore p \supset r$

4. **(a)** Given that A, B, C are true and X, Y, Z are false, determine the truth value of ***any two*** of the following: **3x2=6**

(i) $(A \vee X) \supset (\sim B \supset \sim Y)$

(ii) $[(A \cdot B) \vee (X \vee Y)] \supset (\sim A \vee X)$

(iii) $[(A \supset B) \cdot X] \supset [A \supset (B \vee X)]$

(b) Define the following expression as per instruction: ***(any two)*** **4x2=8**

i. $(q \cdot r) \supset p$ in terms of '~' & 'v'

ii. $(p \supset q) \supset p$ in terms of '~' & '•'

iii. $(p \vee q) \supset \sim p$ in terms of '~' & '•'

(c) Define the following expressions in stroke function: *(any one)* 4

(i) $(p \supset q) \cdot r$

(ii) $(p \supset r) \vee q$

5. Symbolize the following (**any four**) **2 x 4 = 8**

(i) I sit on the chair but my cat sits on the floor. (C.F)

(ii) I will not go unless he finishes his work. (G,W)

(iii) He was annoyed, still he kept quiet. (A,Q)

(iv) Be neither a borrower nor a lender. (B,L)

(v) I cannot drive a car, if it is dark. (C,D)

(vi) The company will progress if and only if its team works efficiently. (P, E)

6. Construct a *formal proof of validity* of **any one** of the following : **6**

(i) $A \supset B$
$B \supset C$
$B \supset D$
$\sim D$
$A \vee B \quad / \therefore C$

(ii) $(N \vee M) \supset P$
$S \vee N$
$\sim S \; / \; \therefore P$

7. Symbolize **any four** of the following using *Quantifiers* and *Propositional Constants*: **2 x 4 = 8**

(i) Cats are mammals. (Cx, Mx)

(ii) All roses are not red. (Rx, Cx)

(iii) A businessman is hardly honest. (Bx, Hx)

(iv) None but brave are winners. (Bx. Wx)

(v) Few leaders are honest. (Lx. Hx)

(vi) Only students are eligible. (Sx. Ex)

8. Write a short note on **any one** of the following: **5**

i) Inference and Implication.

ii) Use of Symbols in Logic.

iii) Rules of Inference

iv) Stroke function