

2020
MATHEMATICS GENERAL
Paper: SEC B(Mathematical Logic)
SET-1
Internal Assessment
Full Marks: 10

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Notations and symbols have their usual meaning.

Answer all questions:

2×5

1.A valuation is a mapping from the set of propositional variables to the two elements set

- a) {T,T} b) {F,F} c) {T,F} d) none of these

2.If $U\{ \}$ \vdash then

- a) $\neg \vdash(\quad)$ b) (\vdash) c) \vdash d)

3.Disjunction of p and q is denoted by

- a) $p \vee q$ b) $p \wedge q$ c) $p \rightarrow q$ d) none of these

4. $\forall A$ is

- a) T b) F c) neither T nor F d) both T and F

5.Which of the following is commutative law-

- a) $A \vee B = A \vee B$ b) $A \vee (B \vee C) = (A \vee B) \vee C$ c) $A \vee A = A$ d) $A \wedge B = B \wedge A$

2020
MATHEMATICS GENERAL
Paper: SEC B(Mathematical Logic)
SET-1
Theory Examination
Full Marks: 40

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Notations and symbols have their usual meaning.

Answer any FIVE questions:

8×5

1. Prove that $\vdash (p \rightarrow q) \rightarrow (p \rightarrow q)$.
2. Check whether the following is valid
 $\{p \rightarrow q, p\} \vdash q$
3. Show that the following system formulas is a contradiction
 $\{p \rightarrow q, p \rightarrow q\}$
4. Show that $A \models B$ iff $\vdash A \rightarrow B$.
5. Show that $\neg p$ is not a logical consequence of $p \rightarrow q$ and $p \wedge q$.
6. Determine whether the following system formulas is a tautology
 $p \rightarrow q, \{(q \rightarrow r) \rightarrow (p \rightarrow r)\}$