

4. If K is a consistent first order theory, then prove that the system that results from adding a denumerable set of new individual constants to K , with an effective enumeration of those constants, is a consistent first order theory that is an extension of K . 10

5. If v_k does not occur free in A , then prove that $A \supset \Lambda v_k A$ is logically valid, where A is an arbitrary wff. 5

Or

6. If a formula A with exactly one free variable v_k is true for I , then, prove that each formula that results from substituting a closed term for the free occurrences of the variable is true for I . 5

7. If $\Gamma \vdash_{QS} A$, then, prove that $\Gamma \models_Q A$. 5

Or

8. If $\vdash_K A$, then prove that $\vdash_K \Lambda v A$. 5

MASTER OF ARTS EXAMINATION, 2023

(2nd Year, 4th Semester)

PHILOSOPHY

[Logic - III]

Time : Two Hours

Full Marks : 30

Answer *either* in English *or* in Bengali.

1. Let I be an interpretation with domain D . Let A be an arbitrary wff. Let s and \acute{s} be two sequences such that for each free variable v in A , if v is the k^{th} variable in the fixed enumeration of the variables, then s and \acute{s} have the same member of D for their k^{th} terms. Then, prove that s satisfies A iff \acute{s} does. 10

Or

2. Let t and u be terms. Let t' be the result of replacing each occurrence of v_k in t by u . Let s be a sequence and let $u*s=d$. Let \acute{s} be $s(d/k)$, i.e. let \acute{s} be the sequence that results from substituting d for the k^{th} term of s . Then, prove that $t'*s = t*s'$. 10

3. If K is a consistent first order theory, then, prove that there is a first order theory K' consistent negation-complete extension of K with the same formulas as K . 10

Or

[Turn over