

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
First Semester - 2022-2023
SYMBOLIC LOGIC HSS F236
Mid Semester Test (Closed Book)

Max Marks 60
Duration 90 Minutes

Date: 05-11-2022

Instructions: Do not use any symbols other than the specified truth-functional connectives; do not use binary language. No marks, if the syllogism is not standard-form. Attempt all parts of a question at one place.

1. What are the three 'laws of thought'? Critically discuss their privileged status as the most fundamental laws of thought. (10)
2. Explain with examples 'distribution of terms' in categorical propositions and the related fallacies that arise in categorical syllogisms. (10)
3. State the difference between an 'argument form' and a 'specific form' of an argument and its relation with the truth-table method. (10)
4. Compute the truth-values of the following compound statements given A, B, C as true statements and D and E as false statements. (8)
 - (i) $[(D \equiv \sim A) \cdot \sim (C \cdot \sim B)] \equiv \sim [(A \supset \sim D) \vee (C \equiv E)]$
 - (ii) $\sim \{[(C \cdot \sim E) \supset \sim (A \cdot \sim B)] \supset [\sim (B \vee D) \equiv (\sim C \vee E)]\}$
5. Rewrite them into standard-form categorical syllogisms. Test their validity or invalidity, stating their mood and figure, by the method of Venn diagram. Specify fallacy(ies), if the syllogism is invalid. (10)
 - (i) Some psychological disorders are not inherited afflictions and none of the environmentally produced diseases is inherited afflictions, it follows that some psychological disorders are environmentally produced diseases.
 - (ii) Whoever wrote the Declaration of Independence had a big impact on civilization, and people like Thomas Jefferson certainly had that. So, people like Thomas Jefferson wrote the Declaration of Independence.
6. Symbolize the argument by suggested notation and use truth-table method to determine its validity or invalidity. (8)

Vitamin E is an antioxidant and a useless food supplement if and only if it does not reduce heart disease. It is not the case that either vitamin E does not reduce heart disease or is not an antioxidant. Therefore, vitamin E is not a useless food supplement. (A = antioxidant, U = useless food supplement and R = reduces heart disease)
7. Construct the logical skeletons using S, P, M terms for the following moods in given figures and state whether they are valid or invalid: EIO-1, AOO-2, IAI-4, EOE-3. (4)