

Third Semester FYUGP Degree (Reg) Examination November 2025

KU3DSCPHL203 - SYMBOLIC LOGIC -1

2024 Admission onwards

Time : 2 hours

Maximum Marks : 70

Section A

Answer any 6 questions. Each carry 3 marks.

1. What is the truth value of $p \equiv q$, when both p and q are false? Examine with the help of a truth table.
2. Write the constant symbol that stands for 'if then' and 'if and only if' and explain briefly.
3. X has an umbrella or raincoat. What is the specific form of this statement?
4. Show the principle of Double Negation with the help of a truth table.
5. State the De Morgan's Theorems.
6. Who developed an algebraic system for validating logical arguments? Give a brief note about the author.
7. Name the English Mathematician who developed an algebraic system for logical discussions.
8. Define dot symbol.

Section B

Answer any 4 questions. Each carry 6 marks.

9. Construct truth table to find out which of the following compound statements are tautology, contradiction and contingent. 1) $(p \supset q) \vee p$ 2) $(p \vee q) \supset (q \cdot p)$
10. Use truth table to characterize the following statement forms as tautology, contradictory or contingent. a) $p \supset p$ b) $p \cdot p$ c) $p \vee p$
11. Prove the first and second De Morgan's Theorem with the help of truth tables.
12. Using one example, show how the same argument could be expressed differently in traditional logic and symbolic logic.
13. If A and B are true and X and Y are false statements, determine the truth value of the following statements: a) $(A \vee X)$ b) $(B \cdot Y)$ c) $A \vee (X \cdot Y)$

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14. Distinguish between simple and compound statements.

Section C

Answer any 2 questions. Each carry 14 marks.

15. Define formal proof of validity. Symbolize the given argument using the symbols given in brackets and construct formal proof of validity for the same.
If a man goes to university, then he has a chance to develop his natural intelligence.
If a man has inquisitive mind, then he will go to university. He never got a chance to develop his natural intelligence. Therefore, either he does not have inquisitive mind or he was not lucky. (G,D,I,L)
16. What is formal proof of validity? List nine rules of inference.
17. Symbolize the following argument, change it into argument form and determine their validity/invalidity by truth table method.
If it rains then the plants grow well.
If it does not rain then the plants become dry.
Therefore if plants do not grow well then it becomes dry. (R,G, D)