



## MUAMMOLI MASALA VA TOPSHIRIQLAR:

1.  $H$  formulalar majmuasidan ko'rsatilgan formulalarni keltirib chiqarish mumkinligini ko'rsating:

$$1) H = \{A\} \vdash B \rightarrow A; \quad 2) H = \{A \rightarrow B, B \rightarrow C\} \vdash A \rightarrow C;$$

$$3) H = \{A \rightarrow C\} \vdash \bar{C} \rightarrow \bar{A}; \quad 4) H = \{A \rightarrow B, \bar{B}\} \vdash \bar{A};$$

2. Umumlashgan deduksiya teoremasidan foydalanib, formulalarning isbotlanuvchi ekanligini isbotlang:

$$1) (x \rightarrow y) \rightarrow ((y \rightarrow z) \rightarrow (x \rightarrow z));$$

$$2) (A \rightarrow B) \rightarrow (A \vee C \rightarrow B \vee C);$$

$$3) (A \rightarrow B) \rightarrow ((C \rightarrow A) \rightarrow (C \rightarrow B)).$$

3. Shartlarni o'rin almashtirish, shartlarni qo'shish va shartlarni ajratish qoidalaridan foydalanib, berilganlarning to'g'riligini isbotlang:

$$1) \vdash x \rightarrow (y \rightarrow x \wedge y); \quad 2) \vdash (A \rightarrow B) \wedge \bar{B} \rightarrow \bar{A}; \quad 3) \vdash \bar{A} \rightarrow (A \rightarrow B).$$

4. Quyidagi formula  $A = x_1 \vee x_2 \rightarrow x_3$  va o'zgaruvchilarning 1) (0,0,1); 2) (1,0,0) qiymatlar satri berilgan.  $A$  formula va uning inkori  $\bar{A}$  ni mos formulalar majmuasidan keltirib chiqaring.

5. Quyidagi formula  $A = \bar{x}_1 \vee x_2 \rightarrow \bar{x}_3$  va o'zgaruvchilarning 1) (1,1,1); 2) (1,0,1); 3) (0,1,0) qiymatlar satri berilgan.  $A$  formula va uning inkori  $\bar{A}$  ni mos formulalar majmuasidan keltirib chiqaring.

6. Umumlashgan dedukstiya teoremasidan foydalanib, quyidagi formulalarni isbotlanuvchi ekanligini va ular mulohazalar algebrasida aynan chin(tavtalogiya) formulalar ekanligini isbotlang:

1.  $(x \rightarrow y) \rightarrow ((y \rightarrow z) \rightarrow (x \rightarrow z));$
2.  $(x \rightarrow y) \rightarrow (x \vee z \rightarrow y \vee z);$
3.  $(x \rightarrow y) \rightarrow ((z \rightarrow x) \rightarrow (z \rightarrow y)).$

**7.**  $H$  formulalar to'plamidan berilgan formulani chiqariluvchi ekanligini isbotlang:

1.  $H=\{A \rightarrow B\} \vdash A \& C \rightarrow B \& C;$
2.  $H=\{A \rightarrow B\} \vdash (C \rightarrow A) \rightarrow (C \rightarrow B);$
3.  $H=\{A \rightarrow B\} \vdash (B \rightarrow C) \rightarrow (A \rightarrow C).$

**4.2.11.** Deduksiya va umumlashgan deduksiya teoremlaridan foydalanib, quyidagi qonunlarni isbotlang:

1.  $\vdash (x \rightarrow (y \rightarrow z)) \rightarrow (y \rightarrow (x \rightarrow z));$
2.  $\vdash (x \rightarrow (y \rightarrow z)) \rightarrow (x \& y \rightarrow z);$
3.  $\vdash (x \& y \rightarrow z) \rightarrow (x \rightarrow (y \rightarrow z)).$