

(11) Use truth tables to determine the validity or invalidity of each of the following argument forms:

$$\begin{array}{l} (1) \quad p \cdot q \\ \therefore p \end{array}$$

$$\begin{array}{l} (7) \quad p \supset q \\ \therefore \sim q \supset \sim p \end{array}$$

$$\begin{array}{l} (2) \quad p \\ \therefore p \cdot q \end{array}$$

$$\begin{array}{l} (8) \quad p \supset q \\ \therefore \sim p \supset \sim q \end{array}$$

$$\begin{array}{l} (3) \quad p \vee q \\ \therefore p \end{array}$$

$$\begin{array}{l} (9) \quad p \supset (q \cdot r) \\ \therefore \sim (q \cdot r) \supset \sim p \end{array}$$

$$\begin{array}{l} (4) \quad p \\ \therefore p \vee q \end{array}$$

$$\begin{array}{l} (10) \quad p \vee q \\ p \\ \therefore \sim q \end{array}$$

$$\begin{array}{l} (5) \quad p \\ \therefore p \supset q \end{array}$$

$$\begin{array}{l} (11) \quad p \\ q \\ \therefore p \cdot q \end{array}$$

$$\begin{array}{l} (6) \quad p \\ \therefore q \supset p \end{array}$$

$$(12) \quad p \supset q$$

$$p \supset p$$

$$\therefore p \vee q$$

$$(13) \quad p \supset q$$

$$p \vee q$$

$$\therefore p$$

$$(14) \quad p \supset (q \supset r)$$

$$p \supset q$$

$$\therefore p \supset r$$

$$(15) \quad (p \supset q) \cdot (p \supset r)$$

$$p$$

$$\therefore q \vee r$$

$$(16) \quad p \supset (q \vee r)$$

$$p \supset r$$

$$\therefore p \vee r$$

$$(17) \quad (p \supset q) \cdot (r \supset s)$$

$$p \vee r$$

$$\therefore q \vee s$$

$$(18) \quad (p \supset q) \cdot (r \supset s)$$

$$\sim q \vee \sim s$$

$$\therefore \sim p \vee \sim r$$

$$(19) \quad (p \vee q) \supset (p \cdot q)$$

$$p \cdot q$$

$$\therefore p \vee q$$

$$(20) \quad p \vee (q \cdot \sim p)$$

$$p$$

$$\therefore \sim (q \cdot \sim p)$$

$$(21) \quad (p \vee q) \supset (p \cdot q)$$

$$\sim (p \vee q)$$

$$\therefore \sim (p \cdot q)$$