Assignment 1

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-02-13, 23:59 IST.

1) Which sentence is not a proposition?
   a. Canada is a country.
   b. \(-1\) is a real number
   c. \(1+101=110\)
   d. Boston is the capital of Massachusetts.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: c

2) Which sentence is a proposition?
   a. Read this carefully.
   b. \(x+2=11\)
   c. Answer this question.
   d. \(5+7=12\)

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: d

3) Let \(p, q, r\) be the propositions. The truth value of \((p \rightarrow q) \rightarrow r\) is F if \(p, q, r\) have truth values
   a. T, T, T
   b. F, F, T
If the propositions $p$, $q$, $r$ have truth values $T$, $T$, and $F$, then the truth values of $(p \rightarrow (q \rightarrow r)) \rightarrow ((p \rightarrow q) \rightarrow (p \rightarrow r))$ and $p \rightarrow (q \lor r)$ are:

- a. $T, T$
- b. $F, T$
- c. $F, F$
- d. $T, F$

No, the answer is incorrect.
Score: 0
Accepted Answers: 

Which of the following propositions is not a tautology?

- a. $p \lor \neg p$
- b. $(p \lor \neg p) \lor q$
- c. $(p \lor \neg q) \lor \neg p$
- d. $p \lor \neg q$

No, the answer is incorrect.
Score: 0
Accepted Answers: 

The number of tautologies in the following compound statements:
(i) $p \rightarrow (p \lor q)$
(ii) $\neg p \rightarrow (p \lor q)$
(iii) $p \land (p \lor q)$
(iv) $\neg (p \lor q) \rightarrow p$

is:
- a. 4
- b. 3
- c. 2
- d. 1

No, the answer is incorrect.
Score: 0
Accepted Answers: 

7) The compound proposition \( p \iff q \) is equivalent to

- a. \( \neg p \lor \neg q \)
- b. \( p \lor q \)
- c. \( (p \to q) \land (q \to p) \)
- d. \( \neg pq \land \neg pq \)

No, the answer is incorrect.
Score: 0
Accepted Answers: 

8) For the compound proposition \( p \to q \), its contrapositive is

- a. \( q \to p \)
- b. \( \neg p \to \neg q \)
- c. \( \neg q \to \neg p \)
- d. \( p \to \neg q \)

No, the answer is incorrect.
Score: 0
Accepted Answers: 

9) The compound proposition \( \neg (p \lor (\neg p \land q)) \) is logically equivalent to

- a. \( p \land q \)
- b. \( \neg p \land \neg q \)
- c. \( p \lor q \)
- d. \( \neg p \lor \neg q \)

No, the answer is incorrect.
Score: 0
Accepted Answers: 

10)
Which of the following compound propositions is a contradiction?

a. \((p \land q) \rightarrow (p \lor q)\)

b. \((p \land q) \rightarrow p\)

c. \((p \land \neg q) \land (\neg p \lor q)\)

d. \(\neg p \rightarrow (p \lor q)\)

No, the answer is incorrect.
Score: 0
Accepted Answers: 
c

11) For which of these sentences, an “exclusive or” is intended?

a. A password must have at least three digits or be at least eight characters long

b. The prerequisite for the course is a course in number theory or a course in cryptography.

c. To take discrete structures, you must have taken calculus or a course in computer science.

d. Coffee or tea comes with dinner.

No, the answer is incorrect.
Score: 0
Accepted Answers: 
d

12) Let \(p\) and \(q\) be propositions as follows:
\(p\): The message is scanned for viruses.
\(q\): The message was sent from an unknown system.
The system specification “The message is scanned for viruses whenever the message was from an unknown system” can be expressed as

a. \(p \lor q\)

b. \(q \land \neg p\)

c. \(q \lor p\)

d. \(\neg q \rightarrow \neg p\)

No, the answer is incorrect.
Score: 0
Accepted Answers: 
c

13)
Let \( p, q, r \) be the proposition as follows:
- \( p \): The user enters a valid password.
- \( q \): Access is granted.
- \( r \): The user has paid the subscription fee.

The system specification “If the user has not entered a valid password but has paid the subscription fee, then access is granted” can be expressed as

\[
\begin{align*}
\text{a. } & \neg p \land q \land r \\
\text{b. } & \neg p \rightarrow q \land (r \rightarrow q) \\
\text{c. } & \neg (p \lor r) \rightarrow q \\
\text{d. } & \neg (p \land r) \rightarrow q
\end{align*}
\]

No, the answer is incorrect.
Score: 0
Accepted Answers: 
\( d \)

14)

Let \( p, q, r \) be the propositions. For the premises \( p \lor q, p \rightarrow r, \) and \( q \rightarrow r, \) the valid conclusion is

\[
\begin{align*}
\text{a. } & p \\
\text{b. } & \neg p \\
\text{c. } & q \\
\text{d. } & r
\end{align*}
\]

No, the answer is incorrect.
Score: 0
Accepted Answers: 
\( d \)

15)

Let \( p, q, r, s, t \) be the propositions. For the premises \( \neg p \land q, r \rightarrow p, \neg r \rightarrow s, \) and \( s \rightarrow t, \) the conclusion is

\[
\begin{align*}
\text{a. } & p \\
\text{b. } & \neg q \\
\text{c. } & r \\
\text{d. } & t
\end{align*}
\]

No, the answer is incorrect.
Score: 0
Accepted Answers: 
\( d \)