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(i) ⌐ denotes the negation
(ii) ∨ denotes the conjunction and ∧ the disjunction
(iii) ↔ denotes the conditional

How many of the three statements above are correct?

A. 0
B. 1
C. 2
D. 3

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In the following question, $(B,+,\cdot,^{-})$ is a Boolean algebra.
The zero element is denoted by 0 and the unit element by 1.

Consider the following statements:

(i) + is idempotent
(ii) + is distributive over $\cdot$
(iii) there is a neutral element for +
(iv) there is an absorbing element for +

How many of these four statements are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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The converse of $p \rightarrow q$ is:

A. $q \rightarrow p$
B. $(\neg p) \rightarrow (\neg q)$
C. $(\neg q) \rightarrow (\neg p)$
D. None of the above

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The propositional expression p→q is equivalent to:

A. q→p
B. (¬p)→(¬q)
C. (¬q)→(¬p)
D. None of the above

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Consider the following statements:

(i) ¬ has higher precedence than ∨
(ii) ∨ has higher precedence than ∧
(iii) ∧ has higher precedence than ↔
(iv) ↔ has higher precedence than →

How many of these four statements are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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Consider the following statements:

(i) $\neg p \wedge p$ is a tautology
(ii) $p \rightarrow p$ is a contingency
(iii) $p \wedge p$ is a contradiction

How many of these three statements are correct?

A. 0
B. 1
C. 2
D. 3

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QUIZ 5

Let P be a binary predicate.
Assume P(u,v) is the statement: "u loves v."

Which one of the propositions below corresponds to:
"Somebody loves everybody."

A. $\forall u, \forall v, P(u,v)$
B. $\exists u, \forall v, P(u,v)$
C. $\forall u, \exists v, P(u,v)$
D. $\exists u, \exists v, P(u,v)$
E. None of the above

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QUIZ 5

Let P be a binary predicate.
Assume P(u,v) is the statement: "u loves v."

Which one of the propositions below corresponds to:
"There is somebody who is loved by everybody."

A. $\forall u, \forall v, P(u,v)$
B. $\exists u, \forall v, P(u,v)$
C. $\forall u, \exists v, P(u,v)$
D. $\exists u, \exists v, P(u,v)$
E. None of the above

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Consider $P : \mathbb{R} \to \mathscr{P}$
$u \mapsto P(u)$ where P(u) is the statement "|u|>u".

Consider the propositions below:

(i) $\exists u \in \mathbb{R}, P(u)$
(ii) $\exists u \in \mathbb{R}^+, P(u)$
(iii) $\exists u \in \{\}, P(u)$

How many of these three propositions are true?

A. 0
B. 1
C. 2
D. 3

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QUIZ 5

Consider $P : \mathbb{R} \to \mathscr{P}$
$u \mapsto P(u)$ where P(u) is the statement "|u|>u".

Consider the propositions below:

(i) $\forall u \in \mathbb{R}$, P(u)
(ii) $\forall u \in \mathbb{R}^+$, P(u)
(iii) $\forall u \in \{\}$, P(u)

How many of these three propositions are true?

A. 0
B. 1
C. 2
D. 3

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Consider the Boolean algebra $(\{0,1\},+,\cdot,^-)$ as seen in class.
Consider the Boolean function F defined by the table below:

x	y	z	$F(x,y,z)$
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

Which one of the statements below is correct?

A. The sum-of-products expansion of F is the sum of 8 minterms.
B. The sum-of-products expansion of F is the sum of 6 minterms.
C. The sum-of-products expansion of F is the sum of 2 minterms.
D. None of the above

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QUIZ 5

Consider the Boolean algebra $(\{0,1\},+,\cdot,^{-})$ as seen in class.
Consider the statements below:

(i) The NOR operation is defined by: $x \downarrow y = \overline{x+y}$
(ii) The Boolean expression $\overline{x}$ is equivalent to a Boolean expression that involves no other Boolean operation than $\downarrow$
(iii) The Boolean expression $x+y$ is equivalent to a Boolean expression that involves no other Boolean operation than $\downarrow$
(iv) The Boolean expression $x \cdot y$ is equivalent to a Boolean expression that involves no other Boolean operation than $\downarrow$
(v) $\{\downarrow\}$ is functionally complete

How many of these five statements are correct?

A. 1
B. 2
C. 3
D. 4
E. 5