Started on	Saturday, 24 September 2022, 9:15 AM
State	Finished
Completed on	Saturday, 24 September 2022, 9:15 AM
Time taken	10 secs
Marks	0.00/24.00
Grade	**0.00** out of 10.00 (**0%**)

Question **1**

Not answered

Marked out of 1.00

How many rows are there in the truth table for the compound proposition $\neg(r \rightarrow \neg q) \vee (p \wedge \neg r)$?

- ○ a. 6
- ○ b. 16
- ○ c. 8
- ○ d. 4
- ○ e. None of these

Your answer is incorrect.

The correct answer is:
8

Question **2**

Not answered

Marked out of 1.00

Which proposition has given truth table

p	q	?
T	T	F
T	F	T
F	T	T
F	F	F

(i) $\neg(p \leftrightarrow q)$

(ii) $p \oplus q$

- a.   Neither (i) nor (ii)
- b.   (ii) only
- c.   Both (i) and (ii)
- d.   (i) only

The correct answer is: Both (i) and (ii)

Question **3**

Not answered

Marked out of 1.00

Select correct statement(s). p denotes any proposition.

- a. $p \wedge \neg p \equiv T$
- b. $p \equiv p \wedge p$
- c. $p \vee T \equiv p$
- d. $p \wedge T \equiv T$

The correct answer is: $p \equiv p \wedge p$

Question **4**

Not answered

Marked out of 1.00

Suppose the truth value of $p \rightarrow \neg(p \wedge \neg q)$ is False.

Find the truth value of p, q.

○ a.　True, True

○ b.　False, True

○ c.　False, False

○ d.　True, False

The correct answer is: True, False

Question **5**

Not answered

Marked out of 1.00

Write the statement in the "If-then" form.

"It is necessary to score a goal to win the match".

Which one is true?

(i) If the team scores a goal, the will win the match.

(ii) If the team doesn't score a goal, they don't win the match.

- a.   Both
- b.   Only (i)
- c.   Only (ii)
- d.   Neither

The correct answer is: Only (ii)

Question **6**

Not answered

Marked out of 1.00

Which proposition are tautologies?

(i) $(p \rightarrow q) \wedge (\neg p \rightarrow q)$

(ii) $((p \rightarrow \neg q) \wedge q) \rightarrow \neg p$

- ○ a. Only (i)
- ○ b. Neither
- ○ c. Both
- ○ d. Only (ii)

Your answer is incorrect.

(i) $\quad p = F, q = F : (p \rightarrow q) \wedge (\neg p \rightarrow q) = (F \rightarrow F) \wedge (T \rightarrow F) = F$

(ii) use truth table or Keep in mind: $p \rightarrow q \equiv \bar{q} \rightarrow \bar{p}$

The correct answer is:
Only (ii)

Question **7**

Not answered

Marked out of 1.00

Suppose the variable *x* represents students, *F(x)* means "*x* is a freshman", and *M(x)* means "*x* is a math major".

Translate

$\forall x(F(x) \to \neg M(x)).$

into English statement.

- ○ a.　No math major is a freshman
- ○ b.　None of these
- ○ c.　Some freshmen are math majors
- ○ d.　Every math major is a freshman

The correct answer is: No math major is a freshman

Question **8**

Not answered

Marked out of 1.00

Let $F(A)$ be the predicate "*A* is a finite set" and $S(A, B)$ be the predicate "*A* is contained in *B*". Suppose the universe of discourse consists of all sets. Translate the statement into symbols.

"Every subset of a finite set is finite"

Which one is true?

(i) $\forall A \forall B[(F(B) \wedge S(A, B)) \rightarrow F(A)]$
(ii) $\forall A \forall B[(F(B) \wedge S(A, B)) \wedge F(A)]$
(iii) $\forall A \forall B[(F(B) \rightarrow S(A, B)) \wedge F(A)]$

   a.   (i)

   b.   (i) and (ii)

   c.   (iii)

   d.   (ii)

The correct answer is: (i)

Question **9**

Not answered

Marked out of 1.00

Let $F(A)$ be the predicate "A is a finite set" and $S(A,B)$ be the predicate "A is contained in B". Suppose the universe of discourse consists of all sets. Translate the statement into symbols.

"The empty set is a subset of every finite set."

Which one is true?

(i) $\forall A[F(A) \rightarrow S(\emptyset, A)]$.
(ii) $\forall A\ [\emptyset \rightarrow F(A) \wedge S(\emptyset, A)]$.
(iii) $\forall A[F(A) \wedge S(\emptyset, A)]$.

○ a.   None of these

○ b.   (i)

○ c.   (iii)

○ d.   (ii)

The correct answer is: (i)

Question **10**

Not answered

Marked out of 1.00

Determine whether these are valid arguments.

a) If x is a positive real number, then x^2 is a positive real number. Therefore, if a^2 is positive, where a is a real number, then a is a positive real number.

b) If $x^2 \neq 0$, where x is a real number, then $x \neq 0$. Let a be a real number with $a^2 \neq 0$; then $a \neq 0$.

   a.   Both are valid

   b.   a) is invalid, b) is valid

   c.   Neither a) nor b) is valid

   d.   a) is valid, b) is invalid

The correct answer is: a) is invalid, b) is valid

Question **11**

Not answered

Marked out of 1.00

Write the statement in the form "If …, then …."

It is necessary to be registered to join us.

Select one or more.

(i) If you join us, then you are registered.

(ii) If you don't join us, the you are not registered.

(iii) If you are not registered, then you cannot join us.

- a. (i) and (iii)
- b. (i) and (ii)
- c. None of the other choices is correct
- d. Only (i)
- e. Only (iii)

Your answer is incorrect.

The correct answer is:
(i) and (iii)

Question **12**

Not answered

Marked out of 1.00

Find a proposition with the given truth table.

p	q	?
T	T	T
T	F	F
F	T	T
F	F	F

○ a. p ∨ q

○ b. p ^ q

○ c. p

○ d. None of these

○ e. q

Your answer is incorrect.

Consider rows where the proposition is TRUE.

The correct answer is:
q

Question **13**

Not answered

Marked out of 1.00

Let Q(w) be the statement "the word w contains the letter e". Find the true value of each of these statements:

(i)   Q(lemon)

(ii) Q(false)

○ a. (i): false, (ii): false

○ b. (i): true, (ii): false

○ c. (i): true, (ii): true

○ d. (i): false, (ii): true

The correct answer is: (i): true, (ii): true

Question **14**

Not answered

Marked out of 1.00

Suppose the variable *x* represents students, *F(x)* means "*x* is a freshman", and *M(x)* means "*x* is a math major".

Translate

$$\forall x(M(x) \to \neg F(x))$$

into English statement.

- a. Every math major is a freshman

- b. No freshman is a math major.

- c. None of these

- d. Some freshmen are math majors

The correct answer is: No freshman is a math major.

Question **15**

Not answered

Marked out of 1.00

Using c for "it is cold" and r for "it is rainy", write "It is rainy if it is not cold" in symbols.

(i) $\neg c \to r$

(ii) $r \to \neg c$

(iii) $c \to r$

(iv) $\neg c \wedge r$

- a. (iv)
- b. (iii)
- c. (i)
- d. (ii)
- e. None of the others

The correct answer is: (i)

Question **16**

Not answered

Marked out of 1.00

Which arguments are valid?

(i) All Wowy's fans can sing the song "Thiên đàng". I cannot sing "Thiên đàng". Therefore, I am not a fan of Wowy.

(ii) All Son Tung MTP's fans like the MV "Chạy ngay đi". I like this MV. Therefore, I am a fan of Sơn Tùng.

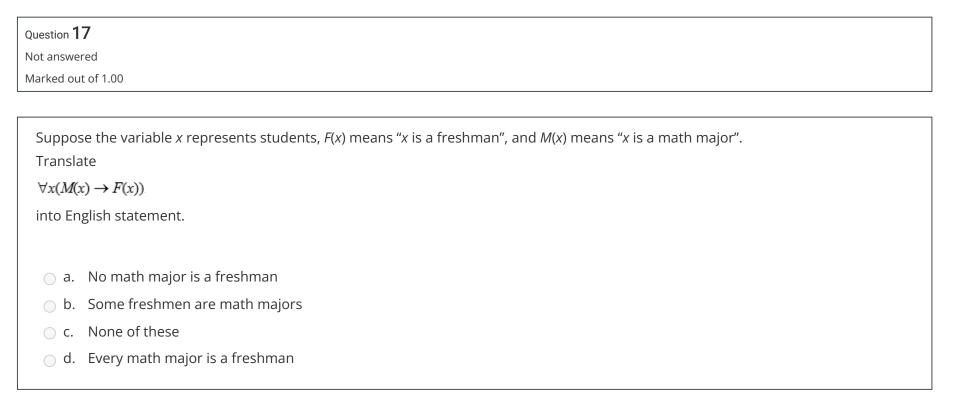○ a.   Both

○ b.   Only (ii)

○ c.   Neither

○ d.   Only (i)

Your answer is incorrect.

(i)
$$P \rightarrow q$$
$$\overline{q}$$
$$\therefore \overline{P}$$
(valid)

(ii)
$$P \rightarrow q$$
$$q$$
$$\therefore P$$
(Invalid)

The correct answer is:
Only (i)

Question **17**

Not answered

Marked out of 1.00

Suppose the variable *x* represents students, *F(x)* means "*x* is a freshman", and *M(x)* means "*x* is a math major".

Translate

$\forall x(M(x) \rightarrow F(x))$

into English statement.

- ○ a.   No math major is a freshman
- ○ b.   Some freshmen are math majors
- ○ c.   None of these
- ○ d.   Every math major is a freshman

The correct answer is: Every math major is a freshman

Question **18**

Not answered

Marked out of 1.00

Suppose the variable x represents students, $F(x)$ means "x is a freshman", and $M(x)$ means "x is a math major".

Translate

$\neg\forall x(\neg F(x) \vee \neg M(x))$.

into English statement.

- a.   Some freshmen are math majors.

- b.   No math major is a freshman.

- c.   Every math major is a freshman.

- d.   None of these

The correct answer is: Some freshmen are math majors.

Question **19**

Not answered

Marked out of 1.00

Which statements are true?

(i) $p \vee (q \wedge r) \equiv (p \wedge q) \vee (p \wedge r)$.

(ii) $p \rightarrow (\neg q \wedge r)$ is logically equivalent to $\neg p \vee \neg (r \rightarrow q)$.

- a.　Only (ii)
- b.　Only (i)
- c.　Both
- d.　Neither

Your answer is incorrect.

(i) False.　$p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$

(ii) True.　$A \rightarrow B \equiv \bar{A} \vee B$

$$p \rightarrow (\neg q \wedge r) \equiv \bar{p} \vee (\neg q \wedge r)$$
$$\equiv \bar{p} \vee \neg(q \vee \bar{r})$$
$$\equiv \bar{p} \vee \neg(\bar{r} \vee q)$$
$$\equiv \bar{p} \vee \neg(r \rightarrow q)$$

The correct answer is:
Only (ii)

Question **20**

Not answered

Marked out of 1.00

Find the **negative** of the statement:

For every student, if this student is a freshman, then he/she is taking a math course.

- a. For every student, if this student is NOT a freshman, then he/she is taking a math course.
- b. For every student, if this student is a freshman, then he/she is NOT taking any math course.
- c. There are some freshmen who are NOT taking any math course.
- d. None of the other choices is correct
- e. For every student, if this student is NOT a freshman, then he/she is NOT taking any math course.

Your answer is incorrect.

For every student, if this student is a freshman, then he/she is taking a math course.

$$\forall x \qquad F(x) \qquad T(x,y) \quad \exists y$$

$$\forall x \exists y \, (F(x) \rightarrow T(x,y))$$

$$\text{Negation:} \quad \neg \forall x \exists y \, (F(x) \rightarrow T(x,y)) \equiv \exists x \forall y \, (F(x) \land \overline{T(x,y)})$$

There are some freshmen who are not taking any math course.

The correct answer is:
There are some freshmen who are NOT taking any math course.

Question **21**

Not answered

Marked out of 1.00

Find the **negation** of the statement "If Lan knows Python, then Lan knows calculus".

- ○ a.　Lan knows Python but Lan doesn't know calculus.
- ○ b.　If Lan knows Python, then Lan doesn't know calculus.
- ○ c.　None of the others
- ○ d.　Lan knows calculus and Lan doesn't know Python.
- ○ e.　If Lan doesn't know Python, then Lan doesn't know calculus.

The correct answer is: Lan knows Python but Lan doesn't know calculus.

Question **22**

Not answered

Marked out of 1.00

State true or false

(i) 1 + 1 = 3 if and only if 2 + 2 = 3.

(ii) If it is hot, then it is hot.

- a. False, True
- b. False, False
- c. True, False
- d. True, True

The correct answer is: True, True

Question **23**

Not answered

Marked out of 1.00

Let $I(x)$ be the statement "x has an Internet connection" and $C(x, y)$ be the statement "x and y have chatted over the Internet," where the domain for the variables x and y consists of all students in your class. Use quantifiers to express each of these statements.

Everyone in your class with an Internet connection has chatted over the Internet with at least one other student in your class.

(1) $\forall x \, \exists y \, (I(x) \wedge C(x, y))$

(2) $\forall x \, \exists y \, (I(x) \rightarrow C(x, y))$

(3) $\exists y \, \forall x \, (I(x) \rightarrow C(x, y))$

○ a.   (i)

  b. None of these

  c. (ii)

  d. (iii)

The correct answer is: (ii)

Question **24**

Not answered

Marked out of 1.00

Let Q(w) be the statement "the word w contains the letter e". Find the true value of each of these statements:

(i)   Q(lemon)

(ii) Q(false)

  a. (i): true, (ii): false

  b. (i): false, (ii): true

  c. (i): false, (ii): false

  d. (i): true, (ii): true

The correct answer is: (i): true, (ii): true