Question No : 1 of 26 Marks: 1 (Budgeted Time 1 Min)

What is the output state of an AND gate if the inputs are 0 and 1?

Answer (Please select your correct option)

- 0
- 3
- 1
- 2

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Question No : 2 of 26 **Marks: 1 (Budgeted Time 1 Min)**

The statement of the form $p \wedge \sim p$ is

Answer (Please select your correct option)

- Tautology
- Contradiction
- Fallacy

Question No : 3 of 26 **Marks: 1 (Budgeted Time 1 Min)**

The contra positive of the conditional statement $p \rightarrow q$ is

Answer (Please select your correct option)

- $\sim p \rightarrow \sim q$
- $q \rightarrow p$
- $\sim q \rightarrow \sim p$
- None of these

Question No : 4 of 26 **Marks: 1 (Budgeted Time 1 Min)**

Select the contra positive of the following statement
If I will get up early in the morning then I will catch my school bus
p = I will get up early in the morning
q = I will catch my school bus

Answer (Please select your correct option)

- $: p \rightarrow: q$
- $p \rightarrow: q$
- $: q \rightarrow: p$
- $: p \rightarrow q$

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Question No : 5 of 26 **Marks: 1 (Budgeted Time 1 Min)**

If p = It is red,
q = It is hot
Then "It is not red but hot" is denoted by : $p \wedge : q$.

Answer (Please select your correct option)

- True
- False

Question No : 6 of 26 Marks: 1 (Budgeted Time 1 Min)

What will be the output of an OR-gate if it has inputs 0 and 1?

Answer (Please select your correct option)

- 0
- 1
- 2
- 3

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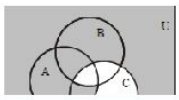
Question No : 7 of 26 **Marks: 1 (Budgeted Time 1 Min)**

In the given Venn diagram shaded area represents



Answer (Please select your correct option)

- $(A \cap B) \cup C$
- $(A \cup B^c) \cup C$
- $(A \cap B^c) \cup C^c$
- $(A \cap B) \cap C^c$

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Question No : 9 of 26 **Marks: 1 (Budgeted Time 1 Min)**

If A and S are two reflexive relations then $A \cap S$ will be

Answer (Please select your correct option)

- Symmetric
- Reflexive
- Transitive

Question No : 9 of 26 **Marks: 1 (Budgeted Time 1 Min)**

If A and S are two reflexive relations then $A \cap S$ will be

Answer (Please select your correct option)

- Symmetric
- Reflexive
- Transitive

Question No : 10 of 26 Marks: 1 (Budgeted Time 1 Min)

Every relation _____

Answer (Please select your correct option)

- may or may not be a function.
- is a bijective mapping.
- Cartesian product set
- is a function.

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Question No : 11 of 26 Marks: 1 (Budgeted Time 1 Min)

How many functions are there from a set with three elements to a set with two elements?

Answer (Please select your correct option)

- 6
- 8
- 12

Question No : 12 of 26 **Marks: 1 (Budgeted Time 1 Min)**

Let $A = \{x, y, z\}$ and $B = \{a, b, c\}$ be two sets then a function f defined as $\{(x, a), (y, a), (z, a)\}$ is

Answer (Please select your correct option)

- Onto
- Constant
- One-to- one
- Onto and constant

Question No : 13 of 26 **Marks: 1 (Budgeted Time 1 Min)**

Let f and g be the functions defined by $f(x) = 2x + 3$ and $g(x) = 3x + 2$ then composition of f and g is

Answer (Please select your correct option)

- $6x + 6$
- $5x + 5$
- $6x + 7$

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Question No : 14 of 26 **Marks: 1 (Budgeted Time 1 Min)**

Let g be the function defined by $g(x) = 3x + 2$ then $g \circ g(x) =$

Answer (Please select your correct option)

- $9x^2 + 4$
- $6x + 4$
- $9x + 8$

Question No : 15 of 26 Marks: 1 (Budgeted Time 1 Min)

If $f(x) = 2x + 1$, $g(x) = x^2 - 1$ then $f \circ g(x) =$

Answer (Please select your correct option)

- $x^2 - 1$
- $2x^2 - 1$
- $2x^3 - 1$

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Question No : 16 of 26 Marks: 1 (Budgeted Time 1 Min)

$\sum_{j=1}^{3}(3j-5) =$

Answer (Please select your correct option)

- 4
- 3
- -2

Question No : 17 of 26 Marks: 1 (Budgeted Time 1 Min)

The part of definition which can be expressed in terms of smaller versions of itself is called

Answer (Please select your correct option)

- Recursion
- Conclusion
- Base
- Restriction

Question No : 18 of 26 **Marks: 1 (Budgeted Time 1 Min)**

Let f is defined recursively by $f(0) = 3, f(n+1) = 2f(n) + 3$ then $f(1) =$

Answer (Please select your correct option)

- 9
- 10
- 18
- 21

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Question No : 19 of 26 Marks: 1 (Budgeted Time 1 Min)

$A = \{1, 2, 3, 4, 5\}$ is a set of first five -------- numbers.

Answer (Please select your correct option)

- True
- natural
- even
- odd

Question No : 20 of 26 **Marks: 1 (Budgeted Time 1 Min)**

If p = Saima is hard working
q = Saima is good in mathematics
"Saima is hard working and good in mathematics" is denoted by

Answer (Please select your correct option)

- $p \vee q$
- $p \wedge q$
- $p \wedge : q$
- $: (p \vee q)$

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Question No : 21 of 26 **Marks: 2 (Budgeted Time 4 Min)**

If A is a set having m elements and B is another set having n elements then how many functions are there from A to B?

Answer (Please click here to Add Answer)

Question No : 22 of 26 **Marks: 2 (Budgeted Time 4 Min)**

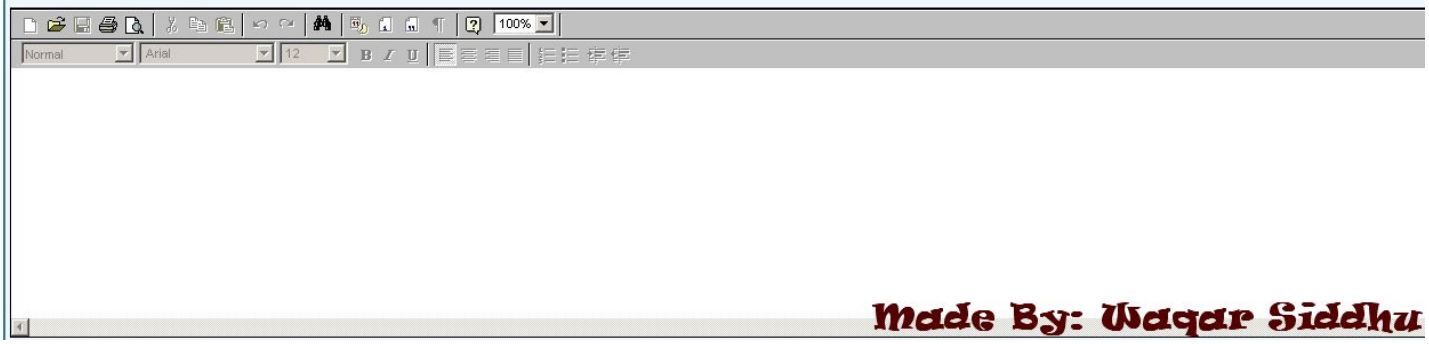
Sum the series $-3+(-1)+1+3+5+\ldots+a_{16}$.

Answer (Please click here to Add Answer)

Question No : 23 of 26 **Marks: 3 (Budgeted Time 6 Min)**

Determine whether the function f from set $\{a,b,c,d\}$ to set $\{1,2,3,4\}$ with $f(a) = 4$, $f(b) = 2$, $f(c) = 1$, $f(d) = 3$ is a bijective function.

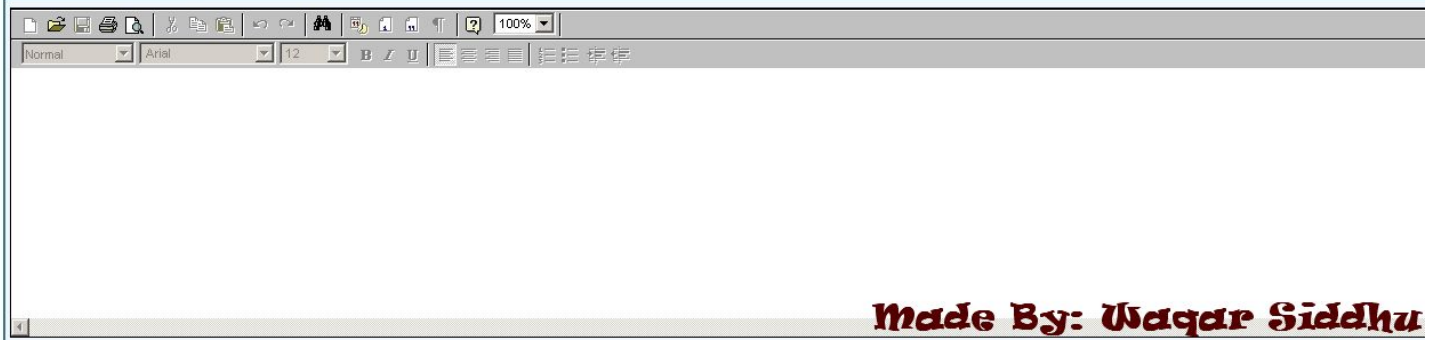
Answer (Please click here to Add Answer)



Question No : 24 of 26 **Marks: 3 (Budgeted Time 6 Min)**

Let $f(x) = 2x + 1$ and $g(x) = x^2 - 1$ be the real valued function the find the expression $g \circ g(x) =$

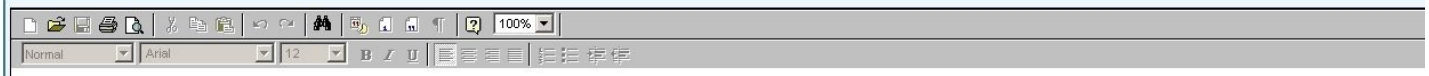
Answer (Please click here to Add Answer)



Question No : 25 of 26 **Marks: 5 (Budgeted Time 10 Min)**

Let A be a set of integers and R is a relation defined on it as $R = \{(x, y)) : x \in Z, y \in Z, (x - y) \text{ is divisible by } 2\}$. Show that R is equivalence relation.

Answer (Please click here to Add Answer)



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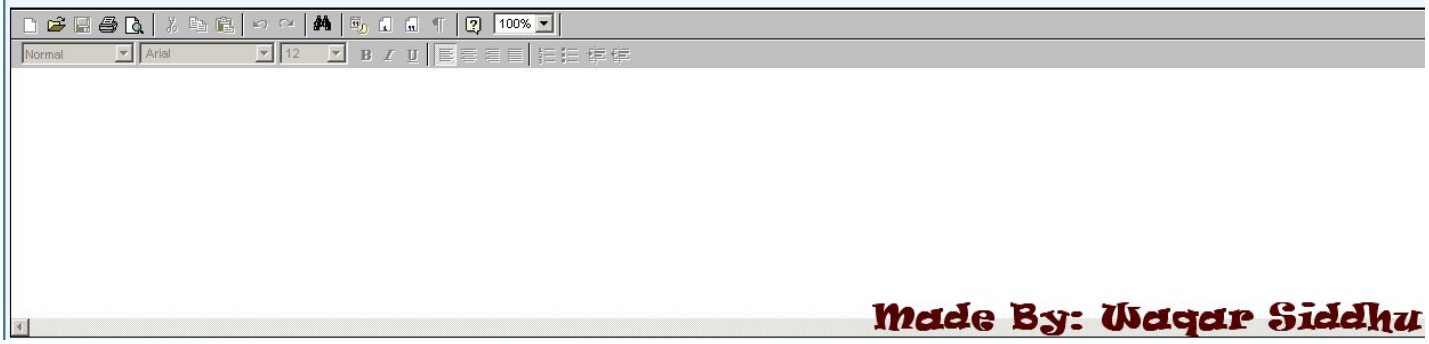
Question No : 26 of 26 **Marks: 5 (Budgeted Time 10 Min)**

Define a sequence $a_0, a_1, a_2, \ldots$ by the formula $a_n = 3n + 1$, for all integers $n \geq 0$. Show that this sequence satisfies the recurrence relation $a_k = a_{k-1} + 3$, for all integers $k \geq 1$.

Answer (Please click here to Add Answer)



Question No : 8 of 26 **Marks: 1 (Budgeted Time 1 Min)**

Let U be the universal set and A is its subset then $A \cup A^c$ is equal to

Answer (Please select your correct option)

- A
- A^c
- ϕ
- U

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