Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)

A sub graph of a graph G that contains every vertex of G and is a tree is called

Answer (Please select your correct option)

- Trivial tree
- empty tree
- Spanning tree

Question No : 2 of 52 Marks: 1 (Budgeted Time 1 Min)

A vertex of degree greater than 1 in a tree is called a

Answer (Please select your correct option)

- Branch vertex

correct

- Terminal vertex
- Ancestor

Question No : 3 of 52 Marks: 1 (Budgeted Time 1 Min)

A circuit that consist of a single vertex is called

Answer (Please select your correct option)

- Trivial

correct

- Tree
- Empty

Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

If a graph is a tree then

Answer (Please select your correct option)

- it has 2 spanning trees
- it has only 1 spanning tree
- it has 4 spanning trees
- it has 5 spanning trees

correct

Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)

The logical expression $p \vee q$ will be read as

Answer (Please select your correct option)

- p or q — correct
- p and q
- $p \times q$
- $p - q$

Question No : 6 of 52 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

correct

- False

Question No : 7 of 52 Marks: 1 (Budgeted Time 1 Min)

If A, B and C are the subsets of a universal set U then $(A \cup B) \cup C$ is equal to

Answer (Please select your correct option)

- $A \cup (B \cap C)$
- $A \cap (B \cup C)$
- $\varnothing$
- $A \cup (B \cup C)$

correct

Question No : 8 of 52 Marks: 1 (Budgeted Time 1 Min)

The power set of a set A is the set of all subsets of A and its denoted by P (A).

Answer (Please select your correct option)

- False
- True

correct

Question No : 9 of 52 Marks: 1 (Budgeted Time 1 Min)

Identify the Associative law of union for three sets

Answer (Please select your correct option)

- $A \cup (B \cup C) = (A \cup B) \cup C$ correct
- $A \cap (B \cap C) = (A \cap B) \cap C$
- $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- None of these

Question No : 10 of 52 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)

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

correct

Question No : 11 of 52 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)

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

correct

- $2x^3 - 1$

Question No : 13 of 52 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

correct

- 10
- 18
- 21

Question No : 14 of 52 Marks: 1 (Budgeted Time 1 Min)

If $1+2+3+\text{L}\ +n=\frac{n(n+1)}{2}$ for all integers $n \geq 1$ then $P(k)$ is

Answer (Please select your correct option)

- $1+2+3+\text{L}\ +k=\frac{k(k+1)}{2}$
- $1+2+3+\text{L}\ +n=\frac{n(n+1)}{2}$
- $1+2+3+\text{L}\ +(k+1)=\frac{(k+1)(k+2)}{2}$ correct
- $1+2+3+\text{L}\ +(k-1)=\frac{k(k-1)}{2}$

Question No : 15 of 52 Marks: 1 (Budgeted Time 1 Min)

In Mathematical Induction, inductive step is

Answer (Please select your correct option)

- $\forall k,\ P(k) \rightarrow P(n)$
- $\forall k,\ P(k) \rightarrow P(k+1)$ correct
- $\forall k,\ P(k) \rightarrow P(n+1)$
- $\forall k,\ P(k) \rightarrow P(k-1)$

Question No : 16 of 52 Marks: 1 (Budgeted Time 1 Min)

$P(n)$ is called statement or

Answer (Please select your correct option)

- sentence
- proposition
- inequality
- none of these

correct

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

For all positive integer values of n, $5^n - 1$ is divisible by

Answer (Please select your correct option)

- 3
- 4
- 6
- 0

correct

Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

An integer n is prime if and only if $n > 1$ and for all positive integers r and s, if $n = r.s$ then

Answer (Please select your correct option)

- $r = 1$ *and* $s = 2$ correct
- $r = 1$ *and* $s = 0$
- $r = 2$ *and* $s = 3$
- None of these

Question No : 19 of 52 Marks: 1 (Budgeted Time 1 Min)

Quotient Remainder Theorem states that for any positive integer d, there exist unique integer q and r such that ---------- and $0 \leq r < d$.

Answer (Please select your correct option)

- $n = d.r + q$
- $n = d.q + r$ correct
- $n = r.q + d$
- None of these

Question No : 20 of 52 Marks: 1 (Budgeted Time 1 Min)

The word ---------- refers to a step-by-step method for performing some action.

Answer (Please select your correct option)

- Series
- Relation
- Algorithm
- Function

correct

Question No : 21 of 52 Marks: 1 (Budgeted Time 1 Min)

The greatest common divisor of 27 and 72 is

Answer (Please select your correct option)

- 27
- 9 correct
- 1
- None of these

Question No : 22 of 52 Marks: 1 (Budgeted Time 1 Min)

In how many ways can a set of five letters be selected from the English Alphabets?

Answer (Please select your correct option)

- $C(26,5)$ correct
- $C(5,26)$
- $C(12,3)$
- None of these

Question No : 23 of 52 Marks: 1 (Budgeted Time 1 Min)

If one event can occur in n_1 ways and if for each of these n_1 ways, a second event can occur in n_2 ways, then the total number of ways in which both events occur is

Answer (Please select your correct option)

- $n_1 + n_2$
- $n_1 \cdot n_2$

correct

- $P(n)_1 \cdot P(n_2)$
- $P(n_1) + P(n_2)$

Question No : 24 of 52 Marks: 1 (Budgeted Time 1 Min)

An arrangement of objects without the consideration of order is called

Answer (Please select your correct option)

- Permutation
- Combination

- Selection
- None of these

Question No : 25 of 52 Marks: 1 (Budgeted Time 1 Min)

If the order does not matter and repetition is allowed then total number of ways for selecting k sample from n number of elements is

Answer (Please select your correct option)

- n^k
- $C(n+k-1,k)$

correct

- $P(n,k)$
- $C(n,k)$

Question No : 26 of 52 Marks: 1 (Budgeted Time 1 Min)

If the order matters and repetition is not allowed then total number of ways for selecting k sample from n number of elements is

Answer (Please select your correct option)

- n^k
- $C(n+k-1,k)$
- $P(n,k)$ correct
- $C(n,k)$

Question No : 27 of 52 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

correct

Question No : 28 of 52 Marks: 1 (Budgeted Time 1 Min)

Among 200 people, 150 either play tennis or snooker or both. If 85 play tennis and 60 play tennis and snooker, how many play snooker?

Answer (Please select your correct option)

- 125
- 225
- 85
- 25

correct

Question No : 29 of 52 Marks: 1 (Budgeted Time 1 Min)

A procedure that yields a given set of possible outcomes is called

Answer (Please select your correct option)

- Event
- Outcome
- Experiment

correct

Question No : 30 of 52 Marks: 1 (Budgeted Time 1 Min)

What is the probability of getting a number greater than 4 when a die is thrown?

Answer (Please select your correct option)

- $\frac{1}{2}$
- $\frac{3}{2}$
- $\frac{1}{3}$ correct
- 1

Question No : 31 of 52 Marks: 1 (Budgeted Time 1 Min)

If two fair dice are thrown, what is the probability of getting a double six?

Answer (Please select your correct option)

- $\frac{1}{6}$
- $\frac{1}{36}$ correct
- 1
- $\frac{1}{2}$

Question No : 32 of 52 Marks: 1 (Budgeted Time 1 Min)

If A and B are two disjoint (mutually exclusive) events then $P(A \cup B)$ =

Answer (Please select your correct option)

- $P(A) + P(B) + P(A \cap B)$
- $P(A) + P(B) + P(A \cup B)$
- $P(A) + P(B) - P(A \cap B)$
- $P(A) + P(B)$

correct

Question No : 33 of 52 Marks: 1 (Budgeted Time 1 Min)

If a fair die is thrown then what is the probability that a prime number appear?

Answer (Please select your correct option)

- $\frac{1}{2}$ correct
- $\frac{1}{6}$
- $\frac{1}{3}$
- $\frac{2}{3}$

Question No : 34 of 52 Marks: 1 (Budgeted Time 1 Min)

If $P(A \cap B) \neq P(A)P(B)$ then the events A and B are called

Answer (Please select your correct option)

- Dependent

correct

- Independent
- Exclusive

Question No : 35 of 52 Marks: 1 (Budgeted Time 1 Min)

If A, B and C are any three events, then $P(A \cup B \cup C)$ is equal to

Answer (Please select your correct option)

- $P(A) + P(B) + P(C)$
- $P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C) + P(A \cap B \cap C)$

correct

- $P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C)$
- $P(A) + P(B) + P(C) + P(A \cap B \cap C)$

Question No : 36 of 52 Marks: 1 (Budgeted Time 1 Min)

How many vertices will the graph have if it contain 16 edges and all vertices of degree 2?

Answer (Please select your correct option)

- 14
- 16 correct
- 18
- 32

Question No : 37 of 52 Marks: 1 (Budgeted Time 1 Min)

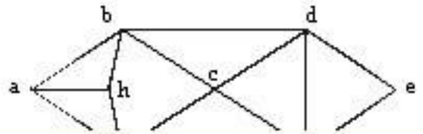
If a graph has any vertex of degree 3 then

Answer (Please select your correct option)

- It must have Euler circuit
- It must have Hamiltonian circuit
- It does not have Euler circuit

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)

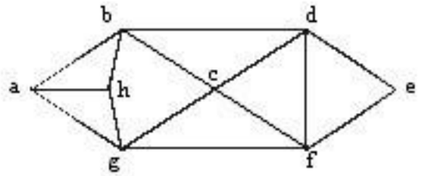
The Hamiltonian circuit for the following graph is



Answer (Please select your correct option)

- abcdefgh
- abefgha
- abcdefgha

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

- abcdefgh
- abefgha
- abcdefgha

Question No : 39 of 52 Marks: 1 (Budgeted Time 1 Min)

Changing rows of a matrix into its columns is called

Answer (Please select your correct option)

- symmetric matrix
- transpose of matrix
- adjoint of matrix
- Hermitian Matrix

Question No : 40 of 52 Marks: 1 (Budgeted Time 1 Min)

Two matrices are said to confirmable for multiplication if number of .....(a)..... of 1st matrix is equal to number of ....(b)..... in 2nd matrix

Answer (Please select your correct option)

- (a) rows, (b) columns
- (a) columns, (b) rows
- (a) columns, (b) columns
- (a) rows, (b) rows

Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)

A sub graph of a graph G that contains every vertex of G and is a tree is called

Answer (Please select your correct option)

- Trivial tree
- empty tree
- Spanning tree

correct

Question No : 2 of 52 Marks: 1 (Budgeted Time 1 Min)

A vertex of degree 1 in a tree is called a

Answer (Please select your correct option)

- Terminal vertex

correct

- Internal vertex

Question No : 3 of 52 Marks: 1 (Budgeted Time 1 Min)

If a tree has 8 vertices then it has

Answer (Please select your correct option)

- 6 edges
- 7 edges

correct

- 9 edges

Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

Complete graph is planar if

Answer (Please select your correct option)

- n = 4
- n>4
- $n \leq 4$

correct

Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)

Any two spanning trees for a graph

Answer (Please select your correct option)

- Does not contain same number of edges
- Have the same degree of corresponding edges
- contain same number of edges

correct

- May or may not contain same number of edges

Question No : 6 of 52 Marks: 1 (Budgeted Time 1 Min)

If p and q are statement variables then bi-conditional of p and q is denoted by

Answer (Please select your correct option)

- $p \leftrightarrow q$ correct
- : $p \rightarrow$: q
- : $q \rightarrow$: p
- None of these

Question No : 7 of 52 Marks: 1 (Budgeted Time 1 Min)

Rephrase the following statement in bi-conditional form
"If you get up early in the morning, you will be healthy"

Answer (Please select your correct option)

- You will be healthy if and only if you get up early in the morning

- If you will be healthy then you will get up early in the morning
- If you will get up early in the morning then you will be healthy
- None of these

Question No : 8 of 52 Marks: 1 (Budgeted Time 1 Min)

Which of the following law is used to show?
$p \leftrightarrow q \equiv q \leftrightarrow p$

Answer (Please select your correct option)

- Implication Law
- Commutative law

correct

- Exportation Law
- None of these

Question No : 9 of 52 Marks: 1 (Budgeted Time 1 Min)

If A and B are two sets then the set which contains all those elements that belong to A or B is

Answer (Please select your correct option)

- $A \cup B$ correct
- $A \cap B$
- $A - B$
- None of these

Question No : 10 of 52 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)

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

correct

Question No : 11 of 52 Marks: 1 (Budgeted Time 1 Min)

If A is a set of all integers and $R = \{(x, y) \in A \text{ iff } xy \geq 1\}$ is a relation on A then the relation R is

Answer (Please select your correct option)

- Transitive
- Symmetric
- Reflexive
- All the given options are true

correct

Question No : 12 of 52 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)

- Base
- Restriction
- Recursion

correct

- Conclusion

Question No : 13 of 52 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 correct
- 10
- 18
- 21

Question No : 14 of 52 Marks: 1 (Budgeted Time 1 Min)

Proof of a statement by induction comprises of two basic steps:

Answer (Please select your correct option)

- Inductive and Deductive
- Basis and Inductive
- Arranging and Sorting
- None of these

correct

Question No : 15 of 52 Marks: 1 (Budgeted Time 1 Min)

In Mathematical Induction, inductive step is

Answer (Please select your correct option)

- $\forall$ k, $P(k) \rightarrow P(n)$
- $\forall$ k, $P(k) \rightarrow P(k+1)$ correct
- $\forall$ k, $P(k) \rightarrow P(n+1)$
- $\forall$ k, $P(k) \rightarrow P(k-1)$

Question No : 16 of 52 Marks: 1 (Budgeted Time 1 Min)

The indirect proof of a statement $p \rightarrow q$ involves

Answer (Please select your correct option)

- Considering : q and then try to reach p
- Considering p and : q are true and try to reach contradiction

correct

- Considering p and then try to reach q
- Considering : p and then try to reach q

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

An integer n is called a perfect square for some integer k iff

Answer (Please select your correct option)

- $n = k$
- $n^2 = k$
- $n = k^2$

correct

- $n = 1$

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

An integer n is called a perfect square for some integer k iff

Answer (Please select your correct option)

- $n = k$
- $n^2 = k$
- $n = k^2$

correct

- $n = 1$

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

An integer n is called a perfect square for some integer k iff

Answer (Please select your correct option)

- $n = k$
- $n^2 = k$
- $n = k^2$
- $n = 1$

Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

An integer n is odd for some integer k iff

Answer (Please select your correct option)

- $n = 2k$
- $n = 2(k+1)$
- $n = 2(k-1)$
- $n = 2k+1$

correct

Question No : 19 of 52 Marks: 1 (Budgeted Time 1 Min)

What is the contra positive of the given statement:
If square root of every prime number is irrational then square root of 2 is irrational.

Answer (Please select your correct option)

- If square root of 2 is not irrational then square root of every prime number is not irrational.

- If square root of 2 is irrational then square root of every prime number is not irrational.
- If square root of 2 is not irrational then square root of every prime number is irrational.
- If square root of every prime number is not irrational then square root of 2 is not irrational.

Question No : 20 of 52 Marks: 1 (Budgeted Time 1 Min)

The method of loop invariants is used to prove ---------- with respect to certain pre and post-conditions.

Answer (Please select your correct option)

- correctness of a loop

correct

- correctness result
- correctness of variables
- correctness of algorithm

Question No : 21 of 52 Marks: 1 (Budgeted Time 1 Min)

How many different ways can three of the letters of the word BYTES be chosen if the first letter must be B ?

Answer (Please select your correct option)

- $P(4,2)$
- P(2,4)
- C(4,2)

correct

- None of these

Question No : 22 of 52 Marks: 1 (Budgeted Time 1 Min)

The value of 0! is

Answer (Please select your correct option)

- 0 correct
- 1
- undefined

Question No : 23 of 52 Marks: 1 (Budgeted Time 1 Min)

An arrangement of objects without the consideration of order is called

Answer (Please select your correct option)

- Permutation
- Combination

correct

- Selection
- None of these

Question No : 24 of 52 Marks: 1 (Budgeted Time 1 Min)

The value of ${}^{n}C_{n} =$

Answer (Please select your correct option)

- 1
- 0
- n

correct

- None of these

Question No : 25 of 52 Marks: 1 (Budgeted Time 1 Min)

If the order does not matter and repetition is allowed then total number of ways for selecting k sample from n number of elements is

Answer (Please select your correct option)

- n^k
- $C(n+k-1,k)$ correct
- $P(n,k)$
- $C(n,k)$

Question No : 26 of 52 Marks: 1 (Budgeted Time 1 Min)

If $(A \cup B) = A$ then

Answer (Please select your correct option)

- $(A \cap B) = B^c$
- $(A \cap B) = A$
- $(A \cap B) = B$

correct

Question No : 27 of 52 Marks: 1 (Budgeted Time 1 Min)

Among 200 people, 150 either play tennis or snooker or both. If 85 play tennis and 60 play tennis and snooker, how many play snooker?

Answer (Please select your correct option)

- 25 correct
- 125
- 225
- 85

Question No : 28 of 52 Marks: 1 (Budgeted Time 1 Min)

If A is a finite set then $n(A^c)$ =

Answer (Please select your correct option)

- $n(U) - n(A)$ correct
- $n(U) + n(A)$
- $n(A) - n(U)$
- 0

Question No : 29 of 52 Marks: 1 (Budgeted Time 1 Min)

What is the smallest integer N such that $\lceil N/5 \rceil = 7$?

Answer (Please select your correct option)

- 35 correct
- 31
- 30
- 0

Question No : 30 of 52 Marks: 1 (Budgeted Time 1 Min)

Compute $\lfloor -1.01 \rfloor$

Answer (Please select your correct option)

- -2
- -1 correct
- 2
- 1

Question No : 31 of 52 Marks: 1 (Budgeted Time 1 Min)

A procedure that yields a given set of possible outcomes is called

Answer (Please select your correct option)

- Event
- Outcome
- Experiment

correct

Question No : 32 of 52 Marks: 1 (Budgeted Time 1 Min)

If a pair of dice is thrown then the probability of getting a total of 5 or 11 is

Answer (Please select your correct option)

- $\frac{1}{18}$
- $\frac{1}{9}$
- $\frac{1}{6}$

correct

Question No : 33 of 52 Marks: 1 (Budgeted Time 1 Min)

The probability of getting a 5 when a die is thrown will be

Answer (Please select your correct option)

- $\frac{1}{6}$ correct
- $\frac{5}{6}$
- $\frac{1}{3}$
- $\frac{1}{36}$

Question No : 34 of 52 Marks: 1 (Budgeted Time 1 Min)

If a die is rolled then what is the probability that the number is greater than 4?

Answer (Please select your correct option)

- $\frac{1}{3}$ correct
- $\frac{3}{4}$
- $\frac{1}{2}$
- $\frac{2}{3}$

Question No : 35 of 52 Marks: 1 (Budgeted Time 1 Min)

A rule that assigns a numerical value to each outcome in a sample space is called

Answer (Please select your correct option)

- One to one function
- Conditional probability
- Random variable

correct

Question No : 36 of 52 Marks: 1 (Budgeted Time 1 Min)

How many vertices will the graph have if it contain 16 edges and all vertices of degree 2?

Answer (Please select your correct option)

- 14
- 16
- 18
- 32

correct

Question No : 37 of 52 Marks: 1 (Budgeted Time 1 Min)

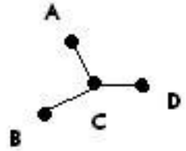
If a graph has any vertex of degree 3 then

Answer (Please select your correct option)

- It must have Euler circuit
- It must have Hamiltonian circuit
- It does not have Euler circuit

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)

In the given graph, vertex "C" has degree



Answer (Please select your correct option)

- 2
- 3
- 4
- 6

correct

Question No : 40 of 52 Marks: 1 (Budgeted Time 1 Min)

The Common fraction for the recurring decimal $0.\overline{81}$ is

Answer (Please select your correct option)

- $\frac{81}{100}$
- $\frac{81}{98}$
- $\frac{9}{11}$ correct
- $\frac{81}{1000}$

Question No : 1 of 52 Marks: 1 (Budgeted Time 1 M

A sub graph of a graph G that contains every vertex of G and is a tree is called

Answer (Please select your correct option)

- Trivial tree
- empty tree
- Spanning tree

correct

Question No : 2 of 52 Marks: 1 (Budgeted Time 1 M

If a tree has 8 vertices then it has

Answer (Please select your correct option)

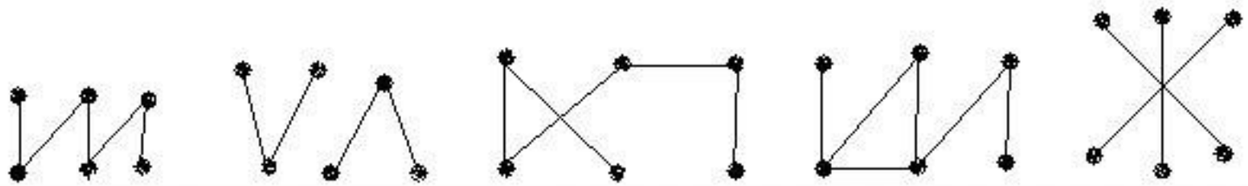
- 6 edges
- 7 edges

correct

- 9 edges

Question No : 3 of 52 Marks: 1 (Budgeted Time 1 M

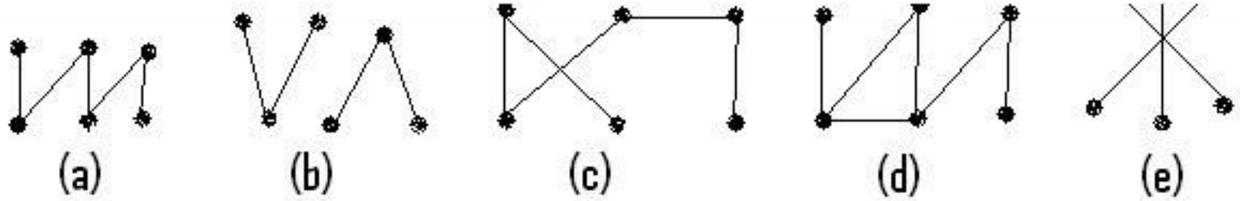
Which of the following graphs are tree?



Answer (Please select your correct option)

- a, b, c
- b, c, d
- c, d, e
- a , c, e

Question No : 3 of 52 Marks: 1 (Budgeted Time 1 M



Answer (Please select your correct option)

- a, b, c
- b, c, d
- c, d, e
- a , c, e

Question No : 4 of 52 Marks: 1 (Budgeted Time 1 M

Every connected tree

Answer (Please select your correct option)

- does not have spanning tree
- may or may not have spanning tree
- has a spanning tree

Question No : 5 of 52 Marks: 1 (Budgeted Time 1 M

Which of the following law is used to show?
$p \leftrightarrow q \equiv q \leftrightarrow p$

Answer (Please select your correct option)

- Implication Law
- Commutative law
- Exportation Law
- None of these

correct

Question No : 6 of 52 Marks: 1 (Budgeted Time 1 M

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

correct

- False

Question No : 6 of 52 Marks: 1 (Budgeted Time 1 M

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 : 7 of 52 Marks: 1 (Budgeted Time 1 M

A circuit with two input signals and one output signal is called

Answer (Please select your correct option)

- NOT-gate (or inverter)
- AND- gate
- None of these

correct

Question No : 8 of 52 Marks: 1 (Budgeted Time 1 M

If A and B are two sets then the set of all elements that belong to A but not B is

Answer (Please select your correct option)

- $A \cup B$
- $A \cap B$
- $A - B$

correct

- None of these

Question No : 9 of 52 Marks: 1 (Budgeted Time 1 M

If A={{5}},then power set of A is equal to

Answer (Please select your correct option)

- {{∅,{5}}}
- {∅,{5}}
- {∅,{{5}}}
- {{∅},{5}}

correct

Question No : 10 of 52 Marks: 1 (Budgeted Time 1 M

Let A be a set and R be a binary relation defined on it, if for all $t \in A, (t,t) \notin R$ then R is

Answer (Please select your correct option)

- Anti-symmetric
- Symmetric
- Irreflexive
- Reflexive

Question No : 11 of 52 Marks: 1 (Budgeted Time 1 M

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.

Question No : 12 of 52 Marks: 1 (Budgeted Time 1 M

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 : 14 of 52 Marks: 1 (Budgeted Time 1 M

If $1+2+3+\mathrm{L}\ +n=\frac{n(n+1)}{2}$ for all integers $n \geq 1$ then $P(k)$ is

Answer (Please select your correct option)

- $1+2+3+\mathrm{L}\ +k=\frac{k(k+1)}{2}$
- $1+2+3+\mathrm{L}\ +n=\frac{n(n+1)}{2}$
- $1+2+3+\mathrm{L}\ +(k+1)=\frac{(k+1)(k+2)}{2}$ correct
- $1+2+3+\mathrm{L}\ +(k-1)=\frac{k(k-1)}{2}$

Question No : 15 of 52 Marks: 1 (Budgeted Time 1 M

$n^2 > n + 3$ is true for all integers

Answer (Please select your correct option)

- $n \geq 3$ correct
- $n \geq 2$
- $n \leq 3$
- $n \geq 1$

Question No : 16 of 52 Marks: 1 (Budgeted Time 1 M

The direct proof of a statement $p \rightarrow q$ involves

Answer (Please select your correct option)

- considering q and then try to reach p
- considering p and then try to reach q
- considering p and ~q and try to reach contradiction
- None of these

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 M

$n! > 2^n$ is true for all integers

Answer (Please select your correct option)

- $n \geq 4$
- $n \leq 4$
- $n \geq 3$
- $n \geq 2$

Question No : 18 of 52 Marks: 1 (Budgeted Time 1 M

An integer n is prime if and only if $n > 1$ and for all positive integers r and s, if $n = r.s$ then

Answer (Please select your correct option)

- $r = 1$ *and* $s = 2$

correct

- $r = 1$ *and* $s = 0$
- $r = 2$ *and* $s = 3$
- None of these

Question No : 19 of 52 Marks: 1 (Budgeted Time 1 M

What is the contra positive of the given statement:
If square root of every prime number is irrational then square root of 2 is irrational.

Answer (Please select your correct option)

- If square root of 2 is not irrational then square root of every prime number is not irrational.

- If square root of 2 is irrational then square root of every prime number is not irrational.
- If square root of 2 is not irrational then square root of every prime number is irrational.
- If square root of every prime number is not irrational then square root of 2 is not irrational.

Question No : 20 of 52 Marks: 1 (Budgeted Time 1 M

The word ---------- refers to a step-by-step method for performing some action.

Answer (Please select your correct option)

- Series
- Relation
- Algorithm
- Function

correct

Question No : 21 of 52 Marks: 1 (Budgeted Time 1 M

If r is a positive integer then $\gcd(r, 0)$ =

Answer (Please select your correct option)

- None of these
- r
- 5
- 0

Question No : 22 of 52 Marks: 1 (Budgeted Time 1 M

Suppose that there are eight runners in a race first will get gold medal, the second will get silver and third will get bronze. How many different ways are there to award these medals if all possible outcomes of race can occur and there is no tie.

Answer (Please select your correct option)

- $P(8,3)$
- $P(100,97)$
- $P(97,3)$
- None of these

Question No : 23 of 52 Marks: 1 (Budgeted Time 1 M

The value of $\frac{(n-1)!}{(n+1)!}$ is

Answer (Please select your correct option)

- 0
- $n(n-1)$
- $\frac{1}{(n^2+n)}$
- can not be determined

Question No : 24 of 52 Marks: 1 (Budgeted Time 1 M

An arrangement of objects without the consideration of order is called

Answer (Please select your correct option)

- Permutation
- Combination
- Selection
- None of these

Question No : 25 of 52 Marks: 1 (Budgeted Time 1 M

The same element can never appear --------- in a set.

Answer (Please select your correct option)

- twice
- once
- thrice

Question No : 26 of 52 Marks: 1 (Budgeted Time 1 M

To find the number of unordered partitions, we have to count the ---------- partitions and then divide it by suitable number to erase the order in partitions.

Answer (Please select your correct option)

- unordered
- ordered

correct

- random
- None of these

Question No : 27 of 52 Marks: 1 (Budgeted Time 1 M

If A and B are two disjoint sets then which of the following must be true

Answer (Please select your correct option)

- $n(A \cup B) = n(A) + n(B)$
- $n(A \cup B) = n(A) + n(B) - n(A \cap B)$
- $n(A \cup B) = \phi$
- None of these

Question No : 28 of 52 Marks: 1 (Budgeted Time 1 M

If A is a finite set then $n(A^c)$ =

Answer (Please select your correct option)

- $n(U) - n(A)$ correct
- $n(U) + n(A)$
- $n(A) - n(U)$
- 0

Question No : 29 of 52 Marks: 1 (Budgeted Time 1 M

The value of $\lceil x \rceil$ for $x = -2.01$ is

Answer (Please select your correct option)

- -3
- 1
- -2
- 0

Question No : 30 of 52 Marks: 1 (Budgeted Time 1 M

If a pair of dice is thrown then the probability of getting a total of 5 or 11 is

Answer (Please select your correct option)

- $\frac{1}{18}$
- $\frac{1}{9}$
- $\frac{1}{6}$

Question No : 31 of 52 Marks: 1 (Budgeted Time 1 M

A die is thrown twice. What is the probability that the sum of the number of dots shown is 3 or 11?

Answer (Please select your correct option)

- $\frac{2}{3}$
- $\frac{1}{9}$
- $\frac{1}{2}$

Question No : 32 of 52 Marks: 1 (Budgeted Time 1 M

If A and B are independent events then $P(A/B)$ =

Answer (Please select your correct option)

- $P(B)$
- $P(A)$
- $P(A \cap B)$
- $P(A \cup B)$

Question No : 33 of 52 Marks: 1 (Budgeted Time 1 M

If $P(A \cap B) \neq P(A)P(B)$ then the events A and B are called

Answer (Please select your correct option)

- Dependent
- Independent
- Exclusive

Question No : 34 of 52 Marks: 1 (Budgeted Time 1 M

If A, B and C are any three events, then $P(A \cup B \cup C)$ is equal to

Answer (Please select your correct option)

- $P(A) + P(B) + P(C)$
- $P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C) + P(A \cap B \cap C)$
- $P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C)$
- $P(A) + P(B) + P(C) + P(A \cap B \cap C)$

Question No : 35 of 52 Marks: 1 (Budgeted Time 1 M

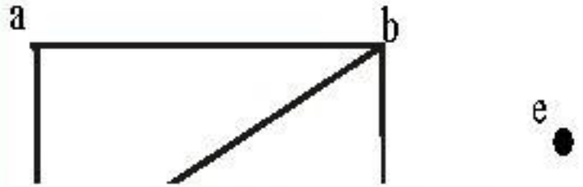
The expectation of x is equal to

Answer (Please select your correct option)

- Sum of all terms
- Sum of all terms divided by number of terms
- $\sum xf(x)$

Question No : 36 of 52 Marks: 1 (Budgeted Time 1 M

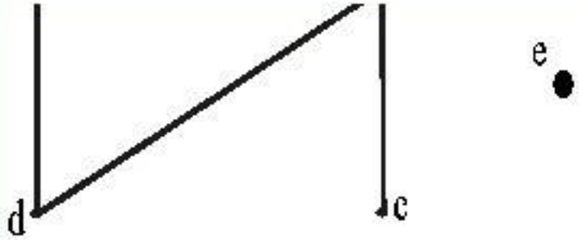
The degrees of the vertices a, b, c, d, e respectively, in the given graph are



Answer (Please select your correct option)

- 2, 2, 3, 1, 1
- 2, 3, 1, 0, 1
- 0, 1, 2, 2, 0
- 2, 3, 1, 2, 0

Question No : 36 of 52 Marks: 1 (Budgeted Time 1 M

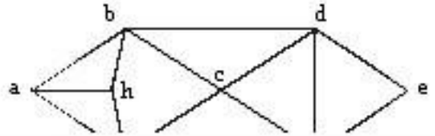


Answer (Please select your correct option)

- 2, 2, 3, 1, 1
- 2, 3, 1, 0, 1
- 0, 1, 2, 2, 0
- 2, 3, 1, 2, 0

Question No : 37 of 52 Marks: 1 (Budgeted Time 1 M

The Hamiltonian circuit for the following graph is



Answer (Please select your correct option)

- abcdefgh
- abefgha
- abcdefgha

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 M

Two matrices are said to confirmable for multiplication if number of .....(a)..... of 1st matrix is equal to number of ....(b)..... in 2nd matrix

Answer (Please select your correct option)

- (a) rows, (b) columns
- (a) columns, (b) rows
- (a) columns, (b) columns
- (a) rows, (b) rows

Question No : 39 of 52 Marks: 1 (Budgeted Time 1 M

The list of the degrees of the vertices of a graph in non-increasing order is called

Answer (Please select your correct option)

- Isomorphic Invariant
- Degree Sequence
- Order of Graph
- Lenght of Circuit

Question No : 40 of 52 Marks: 1 (Budgeted Time 1 M

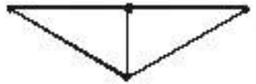
Suppose that a connected planar simple graph has 30 edges. If a plane drawing of this graph has 20 faces, how many vertices does the graph have?

Answer (Please select your correct option)

- 12
- 13
- 14
- 8

Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)

How many non-isomorphic spanning trees does the following simple graph has?



Answer (Please select your correct option)

- 6
- 7
- 8

correct

Question No : 2 of 52 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 correct
- 1
- 2
- 3

Question No : 3 of 52 Marks: 1 (Budgeted Time 1 Min)

Every connected tree

Answer (Please select your correct option)

- does not have spanning tree
- may or may not have spanning tree
- has a spanning tree

correct

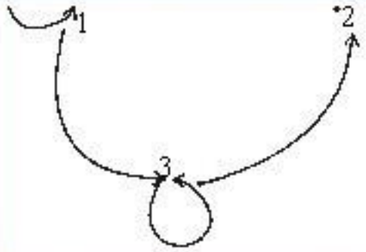
Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

The following directed graph can be represented in form of matrix as

Answer (Please select your correct option)

- $\begin{pmatrix} 1 & 0 & 1 \\ 1 & 0 & 0 \\ \end{pmatrix}$
- $\begin{pmatrix} 2 & 0 & 1 \\ 1 & 0 & 0 \\ \end{pmatrix}$
- $\begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 0 \\ \end{pmatrix}$
- $\begin{pmatrix} 1 & 0 & 1 \\ 1 & 0 & 0 \\ \end{pmatrix}$

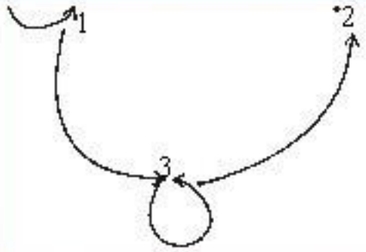
Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

- $\begin{pmatrix} 1 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$
- $\begin{pmatrix} 2 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$
- $\begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 0 \end{pmatrix}$
- $\begin{pmatrix} 1 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$

Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

- $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \end{pmatrix}$
- $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 2 \end{pmatrix}$
- $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 2 \end{pmatrix}$
- $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)

Rephrase the following statement in bi-conditional form
"If you get up early in the morning, you will be healthy"

Answer (Please select your correct option)

- You will be healthy if and only if you get up early in the morning

- If you will be healthy then you will get up early in the morning
- If you will get up early in the morning then you will be healthy
- None of these

Question No : 6 of 52 Marks: 1 (Budgeted Time 1 Min)

An argument is _____ if the conclusion is true when all the premises are true.

Answer (Please select your correct option)

- Invalid
- False
- Valid

correct

- None of these

Question No : 7 of 52 Marks: 1 (Budgeted Time 1 Min)

How many input signals are required for an OR-gate?

Answer (Please select your correct option)

- 2 correct
- 8
- All multiples of two
- 1

Question No : 8 of 52 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

correct

Question No : 9 of 52 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 correct
- 10
- 18
- 21

Question No : 10 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Let a and b be integers. Suppose a function Q is defined recursively as follows:

$$Q(a,b) = \begin{cases} 5 & \text{if } a < b \\ Q(a-b, b+2) + a & \text{if } b \le a \end{cases}$$

Then $Q(2,7)$ =

Answer (Please select your correct option)

- 7
- 2
- 5
- 0

Question No : 11 of 52 Marks: 1 (Budgeted Time 1 Min)

$P(n)$ is called statement or

Answer (Please select your correct option)

- sentence
- proposition
- inequality
- none of these

correct

Question No : 12 of 52 Marks: 1 (Budgeted Time 1 Min)

The direct proof of a statement $p \rightarrow q$ involves

Answer (Please select your correct option)

- considering q and then try to reach p

correct

- considering p and then try to reach q
- considering p and ~q and try to reach contradiction
- None of these

Question No : 13 of 52 Marks: 1 (Budgeted Time 1 Min)

The indirect proof of a statement $p \rightarrow q$ involves

Answer (Please select your correct option)

- Considering : q and then try to reach p
- Considering p and : q are true and try to reach contradiction
- Considering p and then try to reach q correct
- Considering : p and then try to reach q

Question No : 14 of 52 Marks: 1 (Budgeted Time 1 Min)

The contradiction proof of a statement $p \rightarrow q$ involves

Answer (Please select your correct option)

- Considering p and then try to reach q
- Considering : q and then try to reach : p

correct

- Considering p and : q are true and try to reach contradiction
- None of these

Question No : 15 of 52 Marks: 1 (Budgeted Time 1 Min)

$n! > 2^n$ is true for all integers

Answer (Please select your correct option)

- $n \geq 4$
- $n \leq 4$
- $n \geq 3$
- $n \geq 2$

Question No : 16 of 52 Marks: 1 (Budgeted Time 1 Min)

An integer n is prime if and only if $n > 1$ and for all positive integers r and s, if $n = r.s$ then

Answer (Please select your correct option)

- $r = 1$ *and* $s = 2$ correct
- $r = 1$ *and* $s = 0$
- $r = 2$ *and* $s = 3$
- None of these

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

The word ---------- refers to a step-by-step method for performing some action.

Answer (Please select your correct option)

- Series
- Relation
- Algorithm

correct

- Function

Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

gcd(4,12) =

Answer (Please select your correct option)

- 2
- 3
- 4

correct

- 12

Question No : 19 of 52 Marks: 1 (Budgeted Time 1 Min)

How many ways are there to select five players from a 10 members tennis team to arrange a match with another school?

Answer (Please select your correct option)

- $C(10,5)$ correct
- $C(5,10)$
- $P(10,5)$
- None of these

Question No : 20 of 52 Marks: 1 (Budgeted Time 1 Min)

The value of $\frac{n!}{(n-1)!}$ is

Answer (Please select your correct option)

- n correct
- $n-1$
- 0
- can not be determined

Question No : 21 of 52 Marks: 1 (Budgeted Time 1 Min)

The number of k-combinations that can be chosen from a set of n elements can be written as

Answer (Please select your correct option)

- $^{n}C_{k}$
- $^{k}C_{n}$
- $^{n}P_{k}$
- $^{k}P_{n}$

Question No : 22 of 52 Marks: 1 (Budgeted Time 1 Min)

If the order matters and repetition is not allowed then total number of ways for selecting k sample from n number of elements is

Answer (Please select your correct option)

- n^k
- $C(n+k-1,k)$
- $P(n,k)$
- $C(n,k)$

Question No : 23 of 52 Marks: 1 (Budgeted Time 1 Min)

When $A \subseteq B$, then B is called a ---------- of A.

Answer (Please select your correct option)

- superset

correct

- subset
- power set
- none of these

Question No : 24 of 52 Marks: 1 (Budgeted Time 1 Min)

Null set is denoted by

Answer (Please select your correct option)

- ϕ or $\{\}$ correct
- A
- N

Question No : 25 of 52 Marks: 1 (Budgeted Time 1 Min)

Among 200 people, 150 either play tennis or snooker or both. If 85 play tennis and 60 play tennis and snooker, how many play snooker?

Answer (Please select your correct option)

- 125
- 225
- 85
- 25

correct

Question No : 26 of 52 Marks: 1 (Budgeted Time 1 Min)

If A is a finite set then $n(A^c)$ =

Answer (Please select your correct option)

- $n(U) - n(A)$ correct
- $n(U) + n(A)$
- $n(A) - n(U)$
- 0

Question No : 27 of 52 Marks: 1 (Budgeted Time 1 Min)

The value of $\lceil x \rceil$ for $x = -3.01$ is

Answer (Please select your correct option)

- -3.01
- -3

correct

- -2
- -1.99

Question No : 28 of 52 Marks: 1 (Budgeted Time 1 Min)

What is the probability of getting a number greater than 4 when a die is thrown?

Answer (Please select your correct option)

- $\frac{1}{2}$
- $\frac{3}{2}$
- $\frac{1}{3}$ correct
- 1

Question No : 29 of 52 Marks: 1 (Budgeted Time 1 Min)

If two fair dice are thrown, what is the probability of getting a double six?

Answer (Please select your correct option)

- $\frac{1}{6}$
- $\frac{1}{36}$ correct
- 1
- $\frac{1}{2}$

Question No : 30 of 52 Marks: 1 (Budgeted Time 1 Min)

A die is thrown twice. What is the probability that the sum of the number of dots shown is 3 or 11?

Answer (Please select your correct option)

- $\frac{2}{3}$
- $\frac{1}{9}$ correct
- $\frac{1}{2}$

Question No : 31 of 52 Marks: 1 (Budgeted Time 1 Min)

A rule that assigns a numerical value to each outcome in a sample space is called

Answer (Please select your correct option)

- One to one function
- Conditional probability
- Random variable

correct

Question No : 32 of 52 Marks: 1 (Budgeted Time 1 Min)

The expectation μ for the following table is

x_i	1	3
$f(x_i)$	0.4	0.1

Answer (Please select your correct option)

- 0.5
- 3.4
- 0.3
- 0.7

Question No : 33 of 52 Marks: 1 (Budgeted Time 1 Min)

How many vertices will the graph have if it contain 16 edges and all vertices of degree 2?

Answer (Please select your correct option)

- 14
- 16 correct
- 18
- 32

Question No : 34 of 52 Marks: 1 (Budgeted Time 1 Min)

Two distinct edges with the same set of end points are called

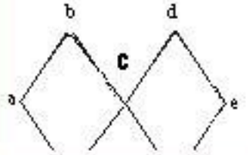
Answer (Please select your correct option)

- Isolated
- Incident
- Parallel

correct

Question No : 35 of 52 Marks: 1 (Budgeted Time 1 Min)

The graph given below

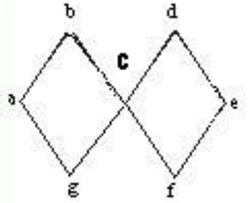


Answer (Please select your correct option)

- has not Euler circuit
- has Hamiltonian circuit
- does not have Hamiltonian circuit

correct

Question No : 35 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

- has not Euler circuit
- has Hamiltonian circuit
- does not have Hamiltonian circuit

Question No : 36 of 52 Marks: 1 (Budgeted Time 1 Min)

Changing rows of a matrix into its columns is called

Answer (Please select your correct option)

- symmetric matrix
- transpose of matrix

correct

- adjoint of matrix
- Hermitian Matrix

Question No : 37 of 52 Marks: 1 (Budgeted Time 1 Min)

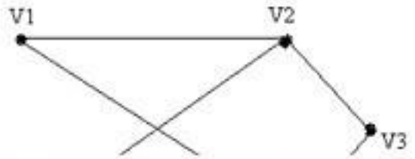
If the transpose of any square matrix is equal to the matrix itself then it is called

Answer (Please select your correct option)

- Additive Inverse
- Hermitian Matrix
- Symmetric Matrix
- Singular Matrix

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)

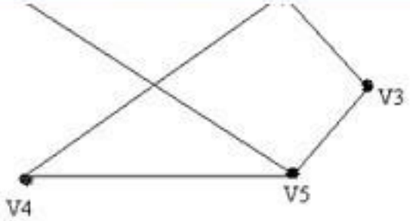
The given graph is called a ------- graph.



Answer (Please select your correct option)

- Simple
- Complete
- Complete Bipartite
- Non-planar

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

- Simple
- Complete
- Complete Bipartite
- Non-planar

Question No : 39 of 52 Marks: 1 (Budgeted Time 1 Min)

In a planar graph, the number of crossing edges are

Answer (Please select your correct option)

- 0
- 1
- 2
- 3

Question No : 40 of 52 Marks: 1 (Budgeted Time 1 Min)

If T is a full binary tree and has 5 internal vertices then the total vertices of T are

Answer (Please select your correct option)

- 11
- 12
- 13
- 10

Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)

A sub graph of a graph G that contains every vertex of G and is a tree is called

Answer (Please select your correct option)

- Trivial tree
- empty tree
- Spanning tree

correct

Question No : 2 of 52 Marks: 1 (Budgeted Time 1 Min)

A circuit that consist of a single vertex is called

Answer (Please select your correct option)

- Tree
- Empty
- Trivial

correct

Question No : 3 of 52 Marks: 1 (Budgeted Time 1 Min)

A vertex of degree 1 in a tree is called

Answer (Please select your correct option)

- Internal vertex
- Terminal vertex

correct

- Sibling vertex

Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

Complete graph is planar if

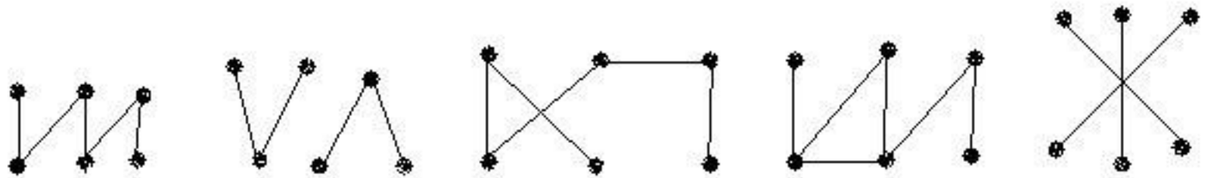
Answer (Please select your correct option)

- n = 4
- n>4
- $n \leq 4$

correct

Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)

Which of the following graphs are tree?



Answer (Please select your correct option)

- a, b, c
- b, c, d
- c, d, e
- a , c, e

Question No : 6 of 52 Marks: 1 (Budgeted Time 1 Min)

Euler formula for graphs is

Answer (Please select your correct option)

- f = e-v
- f = e+v +2
- f = e-v-2
- f = e-v+2

correct

Question No : 7 of 52 Marks: 1 (Budgeted Time 1 Min)

The logical expression $p \vee q$ will be read as

Answer (Please select your correct option)

- p or q — correct
- p and q
- $p \times q$
- $p - q$

Question No : 8 of 52 Marks: 1 (Budgeted Time 1 Min)

In method of proof by contradiction, we suppose the statement to be proved is false.

Answer (Please select your correct option)

- True
- False

Question No : 9 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- A
- A^c
- ϕ correct
- U

Question No : 10 of 52 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

correct

- Transitive

Question No : 11 of 52 Marks: 1 (Budgeted Time 1 Min)

If two relations are reflexive then their composition is

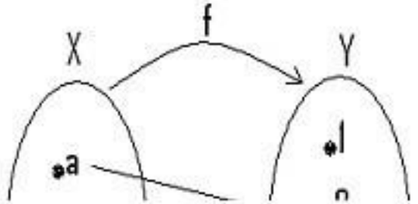
Answer (Please select your correct option)

- Anti-symmetric
- Reflexive
- Irreflexive
- Symmetric

correct

Question No : 12 of 52 Marks: 1 (Budgeted Time 1 Min)

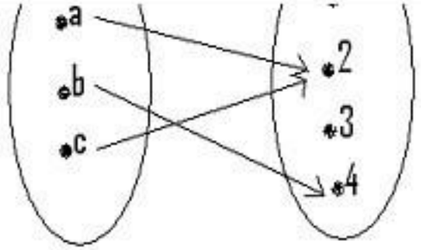
If $X = \{a,b,c\}$ and $Y = \{1,2,3,4\}$. Let us define a function $f : X \to Y$ as shown in following figure then the inverse image of 1 is



Answer (Please select your correct option)

- 1
- 2
- 1,2
- None of these

Question No : 12 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

- 1
- 2
- 1,2
- None of these

Question No : 13 of 52 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)

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

correct

Question No : 14 of 52 Marks: 1 (Budgeted Time 1 Min)

The composition of two functions is _____.

Answer (Please select your correct option)

- One to one
- Bijective
- Not commutative

correct

Question No : 15 of 52 Marks: 1 (Budgeted Time 1 Min)

Let f is defined recursively by $f(0) = 5, f(n+1) = 4f(n) + 2$ then $f(1) =$

Answer (Please select your correct option)

- 8
- 10
- 21
- 22

correct

Question No : 16 of 52 Marks: 1 (Budgeted Time 1 Min)

$P(n)$ is called statement or

Answer (Please select your correct option)

- sentence
- proposition
- inequality
- none of these

correct

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

Let n and d be the integers and $d \neq 0$. Then n is divisible by d or d divides n iff

Answer (Please select your correct option)

- $n = k.d$ for some integer k.

correct

- $n - k = d$
- $n.d = 1$
- $n.k = 0$

Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

The indirect proof of a statement $p \rightarrow q$ involves

Answer (Please select your correct option)

- Considering : q and then try to reach p
- Considering p and : q are true and try to reach contradiction

correct

- Considering p and then try to reach q
- Considering : p and then try to reach q

Question No : 19 of 52 Marks: 1 (Budgeted Time 1 Min)

The contra positive proof of a statement $p \rightarrow q$ involves

Answer (Please select your correct option)

- Considering p and then try to reach q
- Considering : q and then try to reach : p

correct

- Considering p and : q and try to reach contradiction
- None of these

Question No : 20 of 52 Marks: 1 (Budgeted Time 1 Min)

For all positive integer values of n, $5^n - 1$ is divisible by

Answer (Please select your correct option)

- 3
- 4
- 6
- 0

correct

Question No : 21 of 52 Marks: 1 (Budgeted Time 1 Min)

An integer n is prime if and only if $n > 1$ and for all positive integers r and s, if $n = r.s$ then

Answer (Please select your correct option)

- $r = 1$ *and* $s = 2$
- $r = 1$ *and* $s = 0$
- $r = 2$ *and* $s = 3$
- None of these

Question No : 22 of 52 Marks: 1 (Budgeted Time 1 Min)

An integer n is odd for some integer k iff

Answer (Please select your correct option)

- $n = 2k$
- $n = 2(k+1)$
- $n = 2(k-1)$
- $n = 2k+1$

correct

Question No : 23 of 52 Marks: 1 (Budgeted Time 1 Min)

If a and b are any positive integers with $b \neq 0$ and q and r are non negative integers such that $a = b.q + r$ then

Answer (Please select your correct option)

- $\gcd(a,b) = \gcd(b,r)$
- $\gcd(a,r) = \gcd(b,r)$
- $\gcd(a,q) = \gcd(q,r)$

Question No : 24 of 52 Marks: 1 (Budgeted Time 1 Min)

The greatest common divisor of 5 and 10 is

Answer (Please select your correct option)

- 5 correct
- 0
- 1
- None of these

Question No : 25 of 52 Marks: 1 (Budgeted Time 1 Min)

How many ways are there to select a first prize winner, a second prize winner and a third prize winner from 100 different people who have entered in a contest.

Answer (Please select your correct option)

- $P(97,3)$
- $P(100,3)$
- $P(100,97)$
- None of these

Question No : 26 of 52 Marks: 1 (Budgeted Time 1 Min)

If one event can occur in n_1 ways, a second event can occur in n_2 (different) ways, then the total number of ways in which exactly one of the events (i.e., first or second) can occur is

Answer (Please select your correct option)

- $n_1 + n_2$
- $n_1 n_2$
- $2n_1 n_2$
- $2^{n_1 n_2}$

Question No : 27 of 52 Marks: 1 (Budgeted Time 1 Min)

The value of $\frac{(n+1)!}{(n-1)!}$ is

Answer (Please select your correct option)

- 0
- $n(n-1)$
- n^2+n
- can not be determined

Question No : 28 of 52 Marks: 1 (Budgeted Time 1 Min)

If $(A \cup B) = A$ then

Answer (Please select your correct option)

- $(A \cap B) = B^c$
- $(A \cap B) = A$
- $(A \cap B) = B$

correct

Question No : 29 of 52 Marks: 1 (Budgeted Time 1 Min)

To find the number of unordered partitions, we have to count the ---------- partitions and then divide it by suitable number to erase the order in partitions.

Answer (Please select your correct option)

- unordered
- ordered
- random
- None of these

correct

Question No : 30 of 52 Marks: 1 (Budgeted Time 1 Min)

If A and B are finite (overlapping) sets, then which of the following must be true

Answer (Please select your correct option)

- $n(A \cup B) = n(A) + n(B)$
- $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ correct
- $n(A \cup B) = \phi$
- None of these

Question No : 31 of 52 Marks: 1 (Budgeted Time 1 Min)

What is the smallest integer N such that $\left\lceil \frac{N}{6} \right\rceil = 9$

Answer (Please select your correct option)

- 46
- 29
- 49
- 64

correct

Question No : 32 of 52 Marks: 1 (Budgeted Time 1 Min)

A procedure that yields a given set of possible outcomes is called

Answer (Please select your correct option)

- Event
- Outcome
- Experiment

correct

Question No : 33 of 52 Marks: 1 (Budgeted Time 1 Min)

What is the probability of getting a number greater than 4 when a die is thrown?

Answer (Please select your correct option)

- $\frac{1}{2}$
- $\frac{3}{2}$
- $\frac{1}{3}$ correct
- 1

Question No : 34 of 52 Marks: 1 (Budgeted Time 1 Min)

The ---------- of the experiment is the set of possible outcomes.

Answer (Please select your correct option)

- event
- sample space
- subset

correct

Question No : 35 of 52 Marks: 1 (Budgeted Time 1 Min)

If two fair dice are thrown, what is the probability of getting a double six?

Answer (Please select your correct option)

- $\frac{1}{6}$ correct
- $\frac{1}{36}$
- 1
- $\frac{1}{2}$

Question No : 36 of 52 Marks: 1 (Budgeted Time 1 Min)

If a die is thrown then the probability that the dots on the top are prime numbers or odd numbers is

Answer (Please select your correct option)

- 1
- $\frac{1}{3}$
- $\frac{2}{3}$

correct

Question No : 37 of 52 Marks: 1 (Budgeted Time 1 Min)

The expectation μ for the following table is

x_i	1	3
$f(x_i)$	0.4	0.1

Answer (Please select your correct option)

- 0.5
- 3.4
- 0.3
- 0.7

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)

A line segment joining pair of vertices is called

Answer (Please select your correct option)

- Loop
- Edge
- Node

correct

Question No : 39 of 52 Marks: 1 (Budgeted Time 1 Min)

Changing rows of a matrix into its columns is called

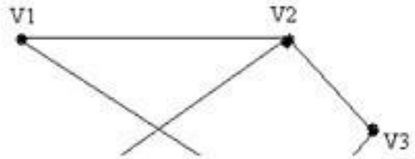
Answer (Please select your correct option)

- symmetric matrix
- transpose of matrix
- adjoint of matrix
- Hermitian Matrix

correct

Question No : 40 of 52 Marks: 1 (Budgeted Time 1 Min)

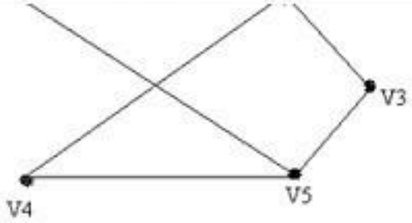
The given graph is called a ------- graph.



Answer (Please select your correct option)

- Simple
- Complete
- Complete Bipartite
- Non-planar

Question No : 40 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

- Simple
- Complete
- Complete Bipartite
- Non-planar

Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)

A sub graph of a graph G that contains every vertex of G and is a tree is called

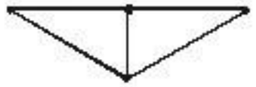
Answer (Please select your correct option)

- Trivial tree
- empty tree
- Spanning tree

correct

Question No : 2 of 52 Marks: 1 (Budgeted Time 1 Min)

How many non-isomorphic spanning trees does the following simple graph has?



Answer (Please select your correct option)

- 6
- 7
- 8

correct

Question No : 3 of 52 Marks: 1 (Budgeted Time 1 Min)

A vertex of degree greater than 1 in a tree is called a

Answer (Please select your correct option)

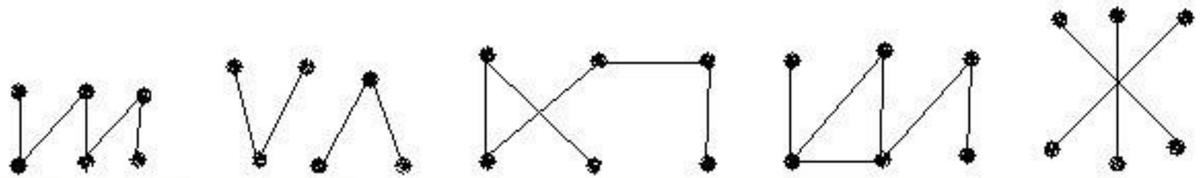
- Branch vertex

correct

- Terminal vertex
- Ancestor

Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

Which of the following graphs are tree?



Answer (Please select your correct option)

- a, b, c
- b, c, d
- c, d, e
- a , c, e

Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

Answer (Please select your correct option)

- a, b, c
- b, c, d
- c, d, e
- a , c, e

Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)

Any two spanning trees for a graph

Answer (Please select your correct option)

- Does not contain same number of edges
- Have the same degree of corresponding edges
- contain same number of edges

correct

- May or may not contain same number of edges

Question No : 6 of 52 Marks: 1 (Budgeted Time 1 Min)

If p & q are statements, then their disjunction is

Answer (Please select your correct option)

- p or q

correct

- p and q
- p and q and p
- None of these

Question No : 7 of 52 Marks: 1 (Budgeted Time 1 Min)

If p and q are statement variables then bi-conditional of p and q is denoted by

Answer (Please select your correct option)

- $p \leftrightarrow q$ correct
- : $p \rightarrow$: q
- : $q \rightarrow$: p
- None of these

Question No : 8 of 52 Marks: 1 (Budgeted Time 1 Min)

How many input signals are required for an OR-gate?

Answer (Please select your correct option)

- 2

correct

- 8
- All multiples of two
- 1

Question No : 9 of 52 Marks: 1 (Budgeted Time 1 Min)

A set which contains no element is called a

Answer (Please select your correct option)

- Null set

correct

- Universal set
- None of these

Question No : 10 of 52 Marks: 1 (Budgeted Time 1 Min)

If A and B are two sets then the set of all elements that belong to A but not B is

Answer (Please select your correct option)

- $A \cup B$
- $A \cap B$
- $A - B$

correct

- None of these

Question No : 11 of 52 Marks: 1 (Budgeted Time 1 Min)

Inverse of relation can be obtained by

Answer (Please select your correct option)

- changing signs of elements in order pairs.
- changing position of elements in order pairs.
- taking multiplicative inverse of elements in order pairs.

Question No : 12 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- $x^3 - 2x^2$
- $x^4 - 2x^2$ correct
- $x^4 + 1$
- $x^4 + 2x^2$

Question No : 13 of 52 Marks: 1 (Budgeted Time 1 Min)

If f and g are two one-to-one functions then their composition that is $f \circ g$ is

Answer (Please select your correct option)

- Not One-to-One
- On to
- One-to-One
- One-to-One and Onto

Question No : 14 of 52 Marks: 1 (Budgeted Time 1 Min)

If the nth term of a sequence is $a_n = 2(-3)^n + 5^n$ then the term a_1 is

Answer (Please select your correct option)

- -1 correct
- 0
- 1
- 2

Question No : 15 of 52 Marks: 1 (Budgeted Time 1 Min)

When 5^k is even, then $5^k + 5^k + 5^k$ must be

Answer (Please select your correct option)

- even

correct

- odd
- negative
- none of these

Question No : 16 of 52 Marks: 1 (Budgeted Time 1 Min)

Proof of a statement by induction comprises of two basic steps:

Answer (Please select your correct option)

- Inductive and Deductive
- Basis and Inductive

correct

- Arranging and Sorting
- None of these

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

In Mathematical Induction, inductive step is

Answer (Please select your correct option)

- $\forall$ k, $P(k) \rightarrow P(n)$
- $\forall$ k, $P(k) \rightarrow P(k+1)$ correct
- $\forall$ k, $P(k) \rightarrow P(n+1)$
- $\forall$ k, $P(k) \rightarrow P(k-1)$

Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

$n^2 > n + 3$ is true for all integers

Answer (Please select your correct option)

- $n \geq 3$ correct
- $n \geq 2$
- $n \leq 3$
- $n \geq 1$

Question No : 19 of 52 Marks: 1 (Budgeted Time 1 Min)

For all positive integers $n^2 + n$ is divisible by

Answer (Please select your correct option)

- 3
- 2 correct
- 7
- 5

Question No : 20 of 52 Marks: 1 (Budgeted Time 1 Min)

The contradiction proof of a statement $p \rightarrow q$ involves

Answer (Please select your correct option)

- Considering p and then try to reach q
- Considering : q and then try to reach : p

- Considering p and : q are true and try to reach contradiction
- None of these

Question No : 21 of 52 Marks: 1 (Budgeted Time 1 Min)

The sum of two irrational numbers must be

Answer (Please select your correct option)

- irrational number
- rational number
- integer
- depends on numbers which are added

correct

Question No : 22 of 52 Marks: 1 (Budgeted Time 1 Min)

The greatest common divisor of 5 and 10 is

Answer (Please select your correct option)

- 5 correct
- 0
- 1
- None of these

Question No : 23 of 52 Marks: 1 (Budgeted Time 1 Min)

If $n(A_i)$ denotes the number of elements in set A_i then $n(A_1 \cup A_2 \cup ... \cup A_m) = n(A_1) + n(A_2) + ... + n(A_m)$ where

Answer (Please select your correct option)

- $A_i \cup A_j = \phi$ *if* $i = j$
- $A_i \cap A_j = \phi$ *if* $i = j$
- $A_i \cup A_j = \phi$ *if* $i \neq j$
- $A_i \cap A_j = \phi$ *if* $i \neq j$

correct

Question No : 24 of 52 Marks: 1 (Budgeted Time 1 Min)

An arrangement of objects with the consideration of order is called

Answer (Please select your correct option)

- Permutation
- Combination

correct 80% sure

- Selection
- None of these

Question No : 25 of 52 Marks: 1 (Budgeted Time 1 Min)

If the order matters and repetition is allowed then total number of ways for selecting k sample from n number of elements is

Answer (Please select your correct option)

- $C(n,k)$
- n^k correct
- $C(n+k-1,k)$
- $P(n,k)$

Question No : 26 of 52 Marks: 1 (Budgeted Time 1 Min)

If the order matters and repetition is not allowed then total number of ways for selecting k sample from n number of elements is

Answer (Please select your correct option)

- n^k
- $C(n+k-1,k)$
- $P(n,k)$ correct
- $C(n,k)$

Question No : 27 of 52 Marks: 1 (Budgeted Time 1 Min)

If the order does not matter and repetition is not allowed then total number of ways for selecting k sample from n number of elements is

Answer (Please select your correct option)

- $P(n,k)$
- $C(n,k)$ correct
- n^k
- $C(n+k-1,k)$

Question No : 28 of 52 Marks: 1 (Budgeted Time 1 Min)

The same element can never appear --------- in a set.

Answer (Please select your correct option)

- twice

correct

- once
- thrice

Question No : 29 of 52 Marks: 1 (Budgeted Time 1 Min)

If A is a finite set then $n(A^c)$ =

Answer (Please select your correct option)

- $n(U) - n(A)$ correct
- $n(U) + n(A)$
- $n(A) - n(U)$
- 0

Question No : 30 of 52 Marks: 1 (Budgeted Time 1 Min)

Compute $\lfloor -1.01 \rfloor$

Answer (Please select your correct option)

- -2
- -1 correct
- 2
- 1

Question No : 31 of 52 Marks: 1 (Budgeted Time 1 Min)

What is the probability of getting a number greater than 4 when a die is thrown?

Answer (Please select your correct option)

- $\frac{1}{2}$
- $\frac{3}{2}$
- $\frac{1}{3}$ correct
- 1

Question No : 32 of 52 Marks: 1 (Budgeted Time 1 Min)

The ---------- of the experiment is the set of possible outcomes.

Answer (Please select your correct option)

- event
- sample space

correct

- subset

Question No : 33 of 52 Marks: 1 (Budgeted Time 1 Min)

If $P(A \cap B) \neq P(A)P(B)$ then the events A and B are called

Answer (Please select your correct option)

- Dependent

correct

- Independent
- Exclusive

Question No : 34 of 52 Marks: 1 (Budgeted Time 1 Min)

A rule that assigns a numerical value to each outcome in a sample space is called

Answer (Please select your correct option)

- One to one function
- Conditional probability
- Random variable

correct

Question No : 35 of 52 Marks: 1 (Budgeted Time 1 Min)

The expectation of x is equal to

Answer (Please select your correct option)

- Sum of all terms
- Sum of all terms divided by number of terms

correct

- $\sum xf(x)$

The expectation μ for the following table is

x_i	1	3
$f(x_i)$	0.4	0.1

Answer (Please select your correct option)

- 0.5
- 3.4
- 0.3
- 0.7

Question No : 37 of 52 Marks: 1 (Budgeted Time 1 Min)

Two distinct edges with the same set of end points are called

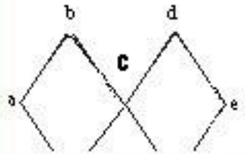
Answer (Please select your correct option)

- Isolated
- Incident
- Parallel

correct

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)

The graph given below

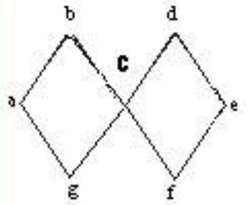


Answer (Please select your correct option)

- has not Euler circuit
- has Hamiltonian circuit
- does not have Hamiltonian circuit

correct

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)



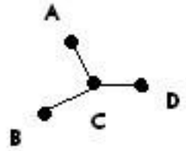
Answer (Please select your correct option)

- has not Euler circuit
- has Hamiltonian circuit
- does not have Hamiltonian circuit

correct

Question No : 39 of 52 Marks: 1 (Budgeted Time 1 Min)

In the given graph, vertex "C" has degree



Answer (Please select your correct option)

- 2
- 3 correct
- 4
- 6

Question No : 40 of 52 Marks: 1 (Budgeted Time 1 Min)

Suppose that a connected planar simple graph has 30 edges. If a plane drawing of this graph has 20 faces, how many vertices does the graph have?

Answer (Please select your correct option)

- 12 correct
- 13
- 14
- 8