National Testing Agency

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Graph Theory

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Graph Theory -1

Section Id :	603489365
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Sub-Section Id :	603489681
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 60348917706 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Graph theory has used,
Statement I: For designing circuit connections
Statement II: For the study of algorithms
Statement III: In grammar of a language

In light of the above statements, choose the ***correct*** answer from the options given below

1. Statement I, II are True
2. Statement I, III are True
3. Statement I, II and III are True
4. Statement I, II, and III are False

Options :

60348966637. 1

60348966638. 2

60348966639. 3

60348966640. 4

Question Number : 2 Question Id : 60348917707 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Number of edges in a complete graph, K_n with n vertices

1. $\frac{n(n+1)}{2}$
2. $\frac{n(n-1)}{2}$
3. n
4. $n-1$

Options :

60348966641. 1

60348966642. 2

60348966643. 3

60348966644. 4

Question Number : 3 Question Id : 60348917708 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A graph with no edges is known as empty graph. Empty graph is also known as?

1. Trivial graph
2. Complete graph
3. Disconnected graph
4. Complete bipartite graph

Options :

60348966645. 1

60348966646. 2

60348966647. 3

60348966648. 4

Question Number : 4 Question Id : 60348917709 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A vertex of a graph is called even or odd depending upon?

1. Total number of edges in a graph is even or odd
2. Total number of vertices in a graph is even or odd
3. Its degree is even or odd
4. None of these

Options :

60348966649. 1

60348966650. 2

60348966651. 3

60348966652. 4

Question Number : 5 Question Id : 60348917710 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A: It is possible to obtain a graph in which the number of vertices is 7 and each vertex has a degree of 5.

Reason R: The sum of the degrees of the vertices equals twice the number of edges. Thus, the total degree has to be an even number

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

Options :

60348966653. 1

60348966654. 2

60348966655. 3

60348966656. 4

Question Number : 6 Question Id : 60348917711 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	List II
A. Cardinality of center of K_n	I. n
B. Cardinality of maximal independent set of the complete bipartite graph $K_{3,3}$	II. n − 1
C. Complete graphs of order n has degree independent set.	III. 3

Choose the **correct** answer from the options given below:

1. A - I, B - III, C - II
2. A - III, B - II, C - I
3. A - II, B - I, C - III
4. A - II, B - III, C - I

Options :

60348966657. 1

60348966658. 2

60348966659. 3

60348966660. 4

Question Number : 7 Question Id : 60348917712 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Length of the walk of a graph is,

1. The number of vertices in walk W
2. The number of edges in walk W
3. Total number of edges in a graph
4. Total number of vertices in a graph

Options :

60348966661. 1

60348966662. 2

60348966663. 3

60348966664. 4

Question Number : 8 Question Id : 60348917713 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: Graph has an even number of odd vertices

Statement II: Every graph has odd number of even vertices

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966665. 1

60348966666. 2

60348966667. 3

60348966668. 4

Question Number : 9 Question Id : 60348917714 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A certain graph G has order 14 and size 27. The degree of each vertex of G is 3, 4 or 5. There are six vertices of degree 4. How many vertices of G have degree 3 and how many have degree 5?

1. 7 vertices have degree 3 and 5 vertices have degree 5
2. 6 vertices have degree 3 and 5 vertices have degree 5
3. 4 vertices have degree 3 and 4 vertices have degree 5
4. 5 vertices have degree 3 and 3 vertices have degree 5

Options :

60348966669. 1

60348966670. 2

60348966671. 3

60348966672. 4

Question Number : 10 Question Id : 60348917715 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	List II
A. In K_n, each vertex has degree,	I. $n(n-1)$
B. The sum of all degrees of K_n is,	II. $\frac{n(n-1)}{2}$
C. The number of edges in K_n is,	III. $n-1$

Choose the **correct** answer from the options given below:

1. A - I, B - III, C - II
2. A - III, B - II, C - I
3. A - II, B - I, C - III
4. A - III, B - I, C - II

Options :

60348966673. 1

60348966674. 2

60348966675. 3

60348966676. 4

Question Number : 11 Question Id : 60348917716 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: The only non-trivial complete bipartite graph which is also a complete graph is K_1.

Statement II: $K_{1,n} = K_{n,1}$ is a tree for all n, and no other complete bipartite graphs are trees.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966677. 1

60348966678. 2

60348966679. 3

60348966680. 4

Question Number : 12 Question Id : 60348917717 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are some statements

Statement I: Bipartite graphs contain no odd cycles

Statement II: Every subgraph of a bipartite graph is itself bipartite.

Statement III: In any bipartite graph with bipartition X and Y, Sum of the degree of vertices of set X < Sum of the degree of vertices of set Y.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Statement I, II are True
2. Statement I, III are True
3. Statement II, III are false
4. Statement I, II, III are False

Options :

60348966681. 1

60348966682. 2

60348966683. 3

60348966684. 4

Question Number : 13 Question Id : 60348917718 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let a graph G has order 10 the number of trees upto isomorphism is,

1. 47
2. 106
3. 235
4. 551

Options :

60348966685. 1

60348966686. 2

60348966687. 3

60348966688. 4

Question Number : 14 Question Id : 60348917719 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

For a loopless graph *G*, the smallest *n* such that there exist non isomorphic *n* vertex graphs having the same list of vertex degrees is

1. 2
2. 3
3. 1
4. 4

Options :

60348966689. 1

60348966690. 2

60348966691. 3

60348966692. 4

Question Number : 15 Question Id : 60348917720 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Two graphs that have the same number of vertices are always isomorphic,

1. True
2. False
3. Partially true
4. Partially false

Options :

60348966693. 1

60348966694. 2

60348966695. 3

60348966696. 4

Question Number : 16 Question Id : 60348917721 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	**List II**
A. Walk	I. Vertices cannot repeat. Edges cannot repeat (Closed)
B. Trail	II. Vertices may repeat. Edges cannot repeat (Closed)
C. Circuit	III. Vertices cannot repeat. Edges cannot repeat (Open)
D. Path	IV. Vertices may repeat. Edges may repeat (Closed or Open)
E. Cycle	V. Vertices may repeat. Edges cannot repeat (Open)

Choose the **correct** answer from the options given below:

1. A - I, B - V, C - III, D - II, E - IV
2. A - IV, B - V, C - II, D - III, E - I
3. A - II, B - IV, C - III, D - V, E - I
4. A - I, B - V, C - IV, D - II, E - III

Options :

60348966697. 1

60348966698. 2

60348966699. 3

60348966700. 4

Question Number : 17 Question Id : 60348917722 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Each u, v-walk contains a

1. Cycle
2. Circuit
3. u, v-path
4. All of these

Options :

60348966701. 1

60348966702. 2

60348966703. 3

60348966704. 4

Question Number : 18 Question Id : 60348917723 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: A Path is defined as an open trail with repeated vertices.

Statement II: A Euler path is a path through the graph which uses every edge exactly once.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966705. 1

60348966706. 2

60348966707. 3

60348966708. 4

Question Number : 19 Question Id : 60348917724 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A graph has an Euler circuit if

1. It is connected and has an even number of vertices.
2. It is connected and has an even number of edges.
3. It is connected and every vertex has even degree.
4. None of these

Options :

60348966709. 1

60348966710. 2

60348966711. 3

60348966712. 4

Question Number : 20 Question Id : 60348917725 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A graph without an Euler circuit but with an Euler path,

1. Must be connected and every vertex must have even degree.
2. Must be connected and every vertex must have odd degree.
3. Must be connected and have exactly one vertex of odd degree.
4. Must be connected and have exactly two vertices of odd degree.

Options :

60348966713. 1

60348966714. 2

60348966715. 3

60348966716. 4

Question Number : 21 Question Id : 60348917726 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick the true statement,

1. A Euler path, in a graph or multigraph, is a path through the graph which uses every vertex exactly once.
2. A Euler path, in a graph or multigraph, is a path through the graph which uses every edge and every vertex exactly once.
3. A Euler path, in a graph or multigraph, is a path through the graph which uses every edge exactly once.
4. None of the above

Options :

60348966717. 1

60348966718. 2

60348966719. 3

60348966720. 4

Question Number : 22 Question Id : 60348917727 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In a complete graph with 12 vertices (A through L), the total number of Hamilton circuits (including mirror-image circuits) that start at vertex A is

1. 10!
2. 11!
3. 12!
4. 13!

Options :

60348966721. 1

60348966722. 2

60348966723. 3

60348966724. 4

Question Number : 23 Question Id : 60348917728 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A : There is no existing relationship between a Hamiltonian path problem and Hamiltonian circuit problem.

Reason R : There is a relationship between Hamiltonian path problem and Hamiltonian circuit problem. The Hamiltonian path in graph G is equal to Hamiltonian cycle in graph H under certain conditions.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

Options :

60348966725. 1

60348966726. 2

60348966727. 3

60348966728. 4

Question Number : 24 Question Id : 60348917729 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The problem of finding a path in a graph that visits every vertex exactly once is called?

1. Hamiltonian cycle problem
2. Hamiltonian path problem
3. NP problem
4. P class problem

Options :

60348966729. 1

60348966730. 2

60348966731. 3

60348966732. 4

Question Number : 25 Question Id : 60348917730 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following problems is similar to that of a Hamiltonian path problem?

1. Knapsack problem
2. Closest pair problem
3. Travelling salesman problem
4. Assignment problem

Options :

60348966733. 1

60348966734. 2

60348966735. 3

60348966736. 4

Question Number : 26 Question Id : 60348917731 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: The adjacency matrix A is a symmetric n × n matrix.

Statement II: Every entry along the principal diagonal of A is 0.

Statement III: Two graphs are non-isomorphic even if their corresponding adjacency matrices differ only by a permutation of rows and columns.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Statement I, II are True
2. Statement I, III are True
3. Statement I, II and III are True
4. Statement I, II, and III are False

Options :

60348966737. 1

60348966738. 2

60348966739. 3

60348966740. 4

Question Number : 27 Question Id : 60348917732 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The entries along the main diagonal in A^2 are the degrees of the vertices of G

1. True
2. False
3. Partially true
4. Partially false

Options :

60348966741. 1

60348966742. 2

60348966743. 3

60348966744. 4

Question Number : 28 Question Id : 60348917733 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are statements in an incident matrix

Statement I: A row with all 0 entries corresponds to a pendent vertex.

Statement II: A row with a single unit entry corresponds to an isolated vertex.

Statement III: The number of 1's in row i of the incidence matrix B, is the degree of v_i.

Statement IV: In B, the number of 1's in each of its columns is 2, since each edge is incident with exactly two vertices.

Statement V: If G is connected with n vertices then the rank of B is n – 2

In light of the above statements, choose the ***correct*** answer from the options given below

1. Statement I, II, III are True
2. Statement I, III are false
3. Statement III and IV are True
4. Statement I, II, III, IV are True

Options :

60348966745. 1

60348966746. 2

60348966747. 3

60348966748. 4

Question Number : 29 Question Id : 60348917734 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: If we delete any vertex from a chordal graph, the resulting graph obtained is again a chordal graph

Statement II: Every induced subgraph of a chordal graph is chordal.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966749. 1

60348966750. 2

60348966751. 3

60348966752. 4

Question Number : 30 Question Id : 60348917735 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let G be a graph obtained by identifying two complete subgraphs of the same order in two graphs G_1 and G_2.Then G is chordal if and only if

1. Either G_1 or G_2 is chordal
2. G1 and G2 are chordal
3. G_1 is complete and G_2 is chordal.
4. None of these

Options :

60348966753. 1

60348966754. 2

60348966755. 3

60348966756. 4

Question Number : 31 Question Id : 60348917736 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A weighted graph is a special type of labeled graph in which the labels are,

1. Small letters
2. Capital letters
3. Numbers
4. None of these

Options :

60348966757. 1

60348966758. 2

60348966759. 3

60348966760. 4

Question Number : 32 Question Id : 60348917737 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Weighted graphs can be used to model,

1. Water networks with weights representing water capacity of pipes
2. Electrical circuits with weights representing resistance or maximum voltage or maximum current
3. Computer or phone networks with weights representing length of wires between nodes
4. All of these

Options :

60348966761. 1

60348966762. 2

60348966763. 3

60348966764. 4

Question Number : 33 Question Id : 60348917738 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given a directed weighted graph. You are also given the shortest path from a source vertex 's' to a destination vertex 't'. If weight of all the edges is *multiplied by 10* then,

Statement I: The shortest path remains same in the modified graph

Statement II: The shortest path may change in the modified graph

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966765. 1

60348966766. 2

60348966767. 3

60348966768. 4

Question Number : 34 Question Id : 60348917739 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given a directed weighted graph. You are also given the shortest path from a source vertex 's' to a destination vertex 't'. If weight of every edge is *increased by 50* units, then

Statement I: The shortest path remains same in the modified graph

Statement II: The shortest path may change in the modified graph

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966769. 1

60348966770. 2

60348966771. 3

60348966772. 4

Question Number : 35 Question Id : 60348917740 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A set of edges in a graph is called a matching if

1. no two end vertices of edjes in the set are adjacent.
2. no two edges in the set are adjacent.
3. all edges in the set are adjacent.
4. all end vertices of edjes in the set are adjacent.

Options :

60348966773. 1

60348966774. 2

60348966775. 3

60348966776. 4

Question Number : 36 Question Id : 60348917741 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

How many perfect matchings are there in a complete graph of 6 vertices?

1. 60
2. 30
3. 24
4. 15

Options :

60348966777. 1

60348966778. 2

60348966779. 3

60348966780. 4

Question Number : 37 Question Id : 60348917742 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of perfect matchings in the complete bipartite graph $K_{n,n}$.

1. n!
2. n
3. n/2
4. 2n!

Options :

60348966781. 1

60348966782. 2

60348966783. 3

60348966784. 4

Question Number : 38 Question Id : 60348917743 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	**List II**
Graph	**Number of perfect matching**
A. Path with 3 vertices, P_3	I. 1
B. Path with 6 vertices	II. 0
C. petersen graph	III. 2
D. Cycle with 4 vertices	IV. 6

Choose the **correct** answer from the options given below:

1. A - I, B - II, C - IV, D - III
2. A - I, B - IV, C - II, D - III
3. A - II, B - I, C - IV, D - III
4. A - II, B - IV, C - I, D - III

Options :

60348966785. 1

60348966786. 2

60348966787. 3

60348966788. 4

Question Number : 39 Question Id : 60348917744 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In which year Hall's Marriage theorem is proved?

1. 1936
2. 1945
3. 1933
4. 1935

Options :

60348966789. 1

60348966790. 2

60348966791. 3

60348966792. 4

Question Number : 40 Question Id : 60348917745 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following graph has a perfect matching?

1. Every r-regular graph
2. Every cycle
3. Every r-regular bipartite graph ($r \geq 1$)
4. None of these

Options :

60348966793. 1

60348966794. 2

60348966795. 3

60348966796. 4

Question Number : 41 Question Id : 60348917746 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let M be an m x n Latin rectangle with $m < n$. Then M can be extended to a Latin square by

1. the deletion of $n - m$ rows
2. the addition of $n - m$ new rows
3. the addition of $m - n$ new rows
4. All of these

Options :

60348966797. 1

60348966798. 2

60348966799. 3

60348966800. 4

Question Number : 42 Question Id : 60348917747 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Choose the correct answers from the options given below

A. The purpose of Chinese postman problem is to determine the shortest route or routes returning to the starting vertex by traversing all edges on a graph at least once.

B. Chinese postman problem is to create the shortest path by traversing some edge(need not be all edjes) on a graph at least once starting from a certain starting vertex.

C. Chinese postman problem is to create the shortest path by traversing each edge on a graph at least once starting from a certain starting vertex.

D. Chinese postman problem may be used in garbage collection, snow and ice controls on streets and highways, road gritting.

Choose the ***correct*** answer from the options given below:

1. A, B, C and D
2. A and B only
3. C and D only
4. B, C and D only

Options :

60348966801. 1

60348966802. 2

60348966803. 3

60348966804. 4

Question Number : 43 Question Id : 60348917748 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Chinese Postman Problem is a variation of _____ circuit problem for undirected graphs.

1. Travelling Salesman Problem
2. Eulerian
3. Non- Eulerian
4. None of these

Options :

60348966805. 1

60348966806. 2

60348966807. 3

60348966808. 4

Question Number : 44 Question Id : 60348917749 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which method will give approximation solution for Travelling Salesman Problem?

1. Nearest Neighbor
2. Brute-force method
3. Branch and Bound
4. None of these

Options :

60348966809. 1

60348966810. 2

60348966811. 3

60348966812. 4

Question Number : 45 Question Id : 60348917750 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In a connected graph G, the radius of G is defined as

1. value of the largest eccentricity
2. value of the smallest eccentricity
3. the sum of all eccentricities
4. None of the above

Options :

60348966813. 1

60348966814. 2

60348966815. 3

60348966816. 4

Question Number : 46 Question Id : 60348917751 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

For any connected graph G,

1. $rad(G) < diam(G) \leq 2\ rad(G)$
2. $rad(G) \leq diam(G) < 2\ rad(G)$
3. $rad(G) < diam(G) < 2\ rad(G)$
4. $rad(G) \leq diam(G) \leq 2\ rad(G)$

Options :

60348966817. 1

60348966818. 2

60348966819. 3

60348966820. 4

Question Number : 47 Question Id : 60348917752 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following statements are true?
A. Every graph is (isomorphic to) the center of some graph.
B. Every graph is isomorphic to) it's centre

1. Neither (A) nor (B)
2. Both (A) and (B)
3. Only A
4. Only B

Options :

60348966821. 1

60348966822. 2

60348966823. 3

60348966824. 4

Question Number : 48 Question Id : 60348917753 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The center of a tree is

1. K_1
2. either K_1 or K_2
3. K_2
4. P_3

Options :

60348966825. 1

60348966826. 2

60348966827. 3

60348966828. 4

Question Number : 49 Question Id : 60348917754 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Dijkstra's Algorithm used to find shortest path for
A. Weighted graph with non-negative weights
B. Weighted graph with negative weights

1. Both A and B
2. Only A
3. Only B
4. None of the above

Options :

60348966829. 1

60348966830. 2

60348966831. 3

60348966832. 4

Question Number : 50 Question Id : 60348917755 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In Floyd Warshall Algorithm the value for diagonal elements is,

1. 1
2. -1
3. 0
4. None of these

Options :

60348966833. 1

60348966834. 2

60348966835. 3

60348966836. 4

Question Number : 51 Question Id : 60348917756 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In Floyd- Warshall Algorithm the value for vertices having a direct edge between them,

1. Weight of that edge
2. 1
3. -1
4. infinity

Options :

60348966837. 1

60348966838. 2

60348966839. 3

60348966840. 4

Question Number : 52 Question Id : 60348917757 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Floyd Warshall's Algorithm can be applied on_____

1. Undirected and unweighted graphs
2. Undirected graphs
3. Directed graphs
4. Acyclic graphs

Options :

60348966841. 1

60348966842. 2

60348966843. 3

60348966844. 4

Question Number : 53 Question Id : 60348917758 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

What happens when the value of k is 0 in the Floyd Warshall Algorithm?

1. 1 intermediate vertex
2. 0 intermediate vertex
3. N intermediate vertex
4. N-1 intermediate vertex

Options :

60348966845. 1

60348966846. 2

60348966847. 3

60348966848. 4

Question Number : 54 Question Id : 60348917759 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	List II
A. Floyd Warshall Algorithm	I. used when we want to minimize material costs in constructing roads that connect multiple points to each other
B. Prim's algorithm	II. Time Complexity is $O(V^3)$
C. Dijkstra's Algorithm	III. Time complexity is O(VE)
D. Bellman – Ford Algorithm	IV. Time Complexity is O(E log V)

Choose the **correct** answer from the options given below:

1. A - II, B - IV, C - I, D - III
2. A - I, B - II, C - IV, D - III
3. A - I, B - IV, C - II, D - III
4. A - II, B - I, C - IV, D - III

Options :

60348966849. 1

60348966850. 2

60348966851. 3

60348966852. 4

Question Number : 55 Question Id : 60348917760 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following statements are true

A.The Bellman-Ford algorithm is an algorithm that computes the shortest paths from a single source vertex to all of the other vertices in a weighted digraph.

B.It is capable of handling graphs in which some of the edge weights are negative numbers.

1. Both A and B
2. Neither A nor B
3. Only A
4. Only B

Options :

60348966853. 1

60348966854. 2

60348966855. 3

60348966856. 4

Question Number : 56 Question Id : 60348917761 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Every non-trivial tree with n vertices has at least two vertices of degree ___

1. 2
2. 1
3. 0
4. n

Options :

60348966857. 1

60348966858. 2

60348966859. 3

60348966860. 4

Question Number : 57 Question Id : 60348917762 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Every tree with average degree k has

1. 2/(2-k) vertices
2. 2/(2+k) vertices
3. 2/k vertices
4. 2/(2-3k) vertices

Options :

60348966861. 1

60348966862. 2

60348966863. 3

60348966864. 4

Question Number : 58 Question Id : 60348917763 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A graph is connected if and only if

1. It has even number of vertices
2. It is a complete graph
3. It has a spanning tree
4. It is a path

Options :

60348966865. 1

60348966866. 2

60348966867. 3

60348966868. 4

Question Number : 59 Question Id : 60348917764 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An edge x of a connected graph is in every spanning tree of G if and only if

1. x have degree 3
2. x is a bridge
3. x have degree 2
4. None of these

Options :

60348966869. 1

60348966870. 2

60348966871. 3

60348966872. 4

Question Number : 60 Question Id : 60348917765 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If T is any spanning forest of a graph G, then

A. Each cutset of G has an edge in common with T

B. Each cycle of G has an edge in common with the complement of T

1. Only A is true
2. Only B is true
3. Neither A nor B is true
4. Both A and B are true

Options :

60348966873. 1

60348966874. 2

60348966875. 3

60348966876. 4

Question Number : 61 Question Id : 60348917766 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Prim's algorithm works in

1. a greedy manner
2. a dynamic manner
3. a network manner
4. all of these

Options :

60348966877. 1

60348966878. 2

60348966879. 3

60348966880. 4

Question Number : 62 Question Id : 60348917767 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following statements are true

A. For any cycle C in the graph, the maximum weight edge in C cannot be in any MST.

B. For any tree T in the graph, the maximum weight edge in C cannot be in any MST.

C. For any forest F in the graph, the maximum weight edge in C cannot be in any MST.

Choose the ***correct*** answer from the options given below:

1. Only B
2. Only A
3. Both A and B
4. A, B and C

Options :

60348966881. 1

60348966882. 2

60348966883. 3

60348966884. 4

Question Number : 63 Question Id : 60348917768 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is true?

1. rim's algorithm initialises with a vertex
2. Prim's algorithm initialises with a edge
3. Prim's algorithm initialises with a vertex which has smallest
4. Prim's algorithm initialises with a forest

Options :

60348966885. 1

60348966886. 2

60348966887. 3

60348966888. 4

Question Number : 64 Question Id : 60348917769 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is false about Prim's algorithm?

1. It is a greedy algorithm
2. It constructs MST by selecting edges in increasing order of their weights
3. It never accepts cycles in the MST
4. It can be implemented using the Fibonacci heap

Options :

60348966889. 1

60348966890. 2

60348966891. 3

60348966892. 4

Question Number : 65 Question Id : 60348917770 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Kruskal's algorithm is used to _____

1. find minimum spanning tree
2. find single source shortest path
3. find all pair shortest path algorithm
4. traverse the graph

Options :

60348966893. 1

60348966894. 2

60348966895. 3

60348966896. 4

Question Number : 66 Question Id : 60348917771 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is true?
A.Prim's algorithm can also be used for disconnected graphs.
B. Kruskal's algorithm can also run on the disconnected graphs

1. A is false but B is true
2. Both A and B are false
3. Both A and B are true
4. A is true but B is false

Options :

60348966897. 1

60348966898. 2

60348966899. 3

60348966900. 4

Question Number : 67 Question Id : 60348917772 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let G be an undirected connected graph with distinct edge weight. Let emax be the edge with maximum weight and emin the edge with minimum weight. Which of the following statements is false?

1. Every minimum spanning tree of G must contain emin.
2. If emax is in a minimum spanning tree, then its removal must disconnect G
3. No minimum spanning tree contains emax
4. G has a unique minimum spanning tree

Options :

60348966901. 1

60348966902. 2

60348966903. 3

60348966904. 4

Question Number : 68 Question Id : 60348917773 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The independence number of K_{14} is

1. 0
2. 1
3. 7
4. 14

Options :

60348966905. 1

60348966906. 2

60348966907. 3

60348966908. 4

Question Number : 69 Question Id : 60348917774 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: The number of vertices in the minimum covering set is called the covering number.

Statement II: The number of vertices in the maximal independent set is called independence number.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966909. 1

60348966910. 2

60348966911. 3

60348966912. 4

Question Number : 70 Question Id : 60348917775 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	**List II**
A. A Subset S of V is independent	I. $\alpha(G) = \beta'(G)$
B. G is a subgraph of a bipartite graph	II. $\alpha'(G) = \|V(G)\| - \beta(G)$
C. G is a tree with $\beta(G)$ as the size of the maximum independent set.	III. G is a bipartite graph with perfect matching
D. $\alpha(G) = \frac{n(G)}{2}$	IV. V − S, is a covering number

Choose the **correct** answer from the options given below:

1. A - III, B - I, C - II, D - IV
2. A - IV, B - II, C - IV, D - I
3. A - II, B - I, C - III, D - IV
4. A - IV, B - I, C - II, D - III

Options :

60348966913. 1

60348966914. 2

60348966915. 3

60348966916. 4

Question Number : 71 Question Id : 60348917776 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is /are (a) non-planar graph(s)?

A. K_4

B. K_5

C. K_2

D. K_3

Choose the ***correct*** answer from the options given below:

1. A only
2. B only
3. A, B and D only
4. C and D only

Options :

60348966917. 1

60348966918. 2

60348966919. 3

60348966920. 4

Question Number : 72 Question Id : 60348917777 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: Any two cycles are homeomorphic.

Statement II: $K_{3,3}$ is non planar.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966921. 1

60348966922. 2

60348966923. 3

60348966924. 4

Question Number : 73 Question Id : 60348917778 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	**List II**
A. $G = K_4 - e$	I. G is 2-connected
B. G is a maximal outer planar graph with $\|V(G)\|=5$	II. G is planar
C. G is a plane graph	III. G is a maximal outer planar graph
D. G does not contain a subdivision of K_5 or $K_{3,3}$ as subgraph	IV. G has one unbounded face

Choose the **correct** answer from the options given below:

1. A - III, B - I, C - II, D - IV
2. A - III, B - I, C - IV, D - II
3. A - II, B - I, C - III, D - IV
4. A - IV, B - I, C - II, D - III

Options :

60348966925. 1

60348966926. 2

60348966927. 3

60348966928. 4

Question Number : 74 Question Id : 60348917779 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let G be a connected planar graph. Then,

A. $|V(G)| = |E(G)|$

B. $|V(G)| - |E(G)| = 2 -$ number of faces

C. $|V(G)| - |E(G)| = 2 +$ number of faces

D. $|V(G)| + |E(G)| = 2 -$ number of faces

Choose the ***correct*** answer from the options given below:

1. A only
2. B only
3. C only
4. D only

Options :

60348966929. 1

60348966930. 2

60348966931. 3

60348966932. 4

Question Number : 75 Question Id : 60348917780 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: Every connected planar graph without multiple edges contains a vertex of degree at most 5.

Statement II: If G is a plane connected graph without triangles and $|V(G)| \geq 3$, then $|E(G)| \geq 2|V(G)| - 4$.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966933. 1

60348966934. 2

60348966935. 3

60348966936. 4

Question Number : 76 Question Id : 60348917781 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match List I with List II

List I	List II
A. G is a graph with 1000 vertices and 3000 edges	I. G has a face bounded by at most four edges
B. G is a simple connected planar graph with 11 faces and $\delta > 0$	II. G contains a vertex of degree atmost 5
C. G is a plane graph	III. G is non- planar
D. G is a plane graph without multiple edges	IV. $\|V(G)\| - \|E(G)\|$ +number of faces = number of components +1

Choose the Correct answer from the options given below:

1. A – III, B – I, C – II, D – IV
2. A – III, B – I, C – IV, D – II
3. A – III, B – IV, C – I, D – II
4. A – IV, B – I, C – II, D – III

Options :

60348966937. 1

60348966938. 2

60348966939. 3

60348966940. 4

Question Number : 77 Question Id : 60348917782 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of cut vertex/vertices of W_5 is

1. 0
2. 1
3. 4
4. 5

Options :

60348966941. 1

60348966942. 2

60348966943. 3

60348966944. 4

Question Number : 78 Question Id : 60348917783 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A: G is a block

Reason R: G is a connected non-trivial graph with no cut vertices

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

Options :

60348966945. 1

60348966946. 2

60348966947. 3

60348966948. 4

Question Number : 79 Question Id : 60348917784 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: If e is a cut edge of G then there exists a partition of V – {v} into subsets U and W such that each u ∈ U and w ∈ W the edge e is on every u-w path.

Statement II: If G is a block then there exists two vertices in G that does not lie in a same cycle.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966949. 1

60348966950. 2

60348966951. 3

60348966952. 4

Question Number : 80 Question Id : 60348917785 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The connectivity of the cycle C_4 is,

1. 1
2. 2
3. 3
4. 4

Options :

60348966953. 1

60348966954. 2

60348966955. 3

60348966956. 4

Question Number : 81 Question Id : 60348917786 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: Given integers a, b, c with $1 \leq a \leq b \leq c$, there exists a graph G with $\kappa(G) = a$, $\kappa'(G) = b$ and $\delta(G) = c$.

Statement II: If $\delta \geq (n/2)$ then $\kappa' = \delta$ in a graph.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966957. 1

60348966958. 2

60348966959. 3

60348966960. 4

Question Number : 82 Question Id : 60348917787 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: Every block is connected

Statement II: There always exists two vertices u and v in every block such that there does not exist a path between u and v

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966961. 1

60348966962. 2

60348966963. 3

60348966964. 4

Question Number : 83 Question Id : 60348917788 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let H be a subgraph of a graph G. Then

A. $X(H) \leq X(G)$.

B. $X(H) \geq X(G)$.

C. $X(H) = X(G) - 2$

D. $X(H) = X(G) + 2$

Choose the ***correct*** answer from the options given below:

1. A only
2. B only
3. C only
4. D only

Options :

60348966965. 1

60348966966. 2

60348966967. 3

60348966968. 4

Question Number : 84 Question Id : 60348917789 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: A cycle of length n ≥ 3 is 2- chromatic if n is even

Statement II: A cycle of length n ≥ 3 is 1- chromatic if n is odd

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966969. 1

60348966970. 2

60348966971. 3

60348966972. 4

Question Number : 85 Question Id : 60348917790 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If every vertex of a graph G lies on at most k odd cycles for some nonnegative integer k, then

A. $X(G) \leq (1+\sqrt{8k+9})/2$

B. $X(G) \geq (1+\sqrt{8k+9})/2$

C. $X(G) \leq (1+\sqrt{8k-9})/2$

D. $X(G) \geq (1+\sqrt{8k+16})/2$

Choose the ***correct*** answer from the options given below:

1. A only
2. B only
3. C only
4. D only

Options :

60348966973. 1

60348966974. 2

60348966975. 3

60348966976. 4

Question Number : 86 Question Id : 60348917791 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let G be a graph of size m ≥ 1, then

A. $X'(G) \geq \frac{m}{\alpha_1(G)}$

B. $X'(G) \leq \frac{m}{\alpha_1(G)}$

C. $X'(G) = \frac{m}{\alpha_1(G)}$

D. $X'(G) \geq \frac{\alpha_1(G)}{m}$

Choose the ***correct*** answer from the options given below:

1. A only
2. B only
3. C only
4. D only

Options :

60348966977. 1

60348966978. 2

60348966979. 3

60348966980. 4

Question Number : 87 Question Id : 60348917792 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: $X'(K_9) = 8$

Statement II: If the order of G is n, then $\alpha'(G) \leq n/2$.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348966981. 1

60348966982. 2

60348966983. 3

60348966984. 4

Question Number : 88 Question Id : 60348917793 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The edge chromatic number of Peterson graph is,

1. 4
2. 6
3. 8
4. 10

Options :

60348966985. 1

60348966986. 2

60348966987. 3

60348966988. 4

Question Number : 89 Question Id : 60348917794 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If G is a planar graph then γ(G) is equal to

A. 0

B. 1

C. 2

D. 5

Choose the ***correct*** answer from the options given below:

1. A only
2. B only
3. C only
4. D only

Options :

60348966989. 1

60348966990. 2

60348966991. 3

60348966992. 4

Question Number : 90 Question Id : 60348917795 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	List II
A. Every bridgeless cubic plane map is 4- colourable.	I. Construction of Elementary contraction
B. G is a planar graph	II. Four Colour conjuncture holds
C. The phenomenon of obtaining a graph G by identifying two adjacent points u and v, that is, by removal of u and v and the addition of a new point w adjacent to those points to which u or v was adjacent.	III. Construction of Geometric dual
D. The phenomenon of constructing G* by placing a vertex in each region of G (including exterior region) and if two regions have an edge x in common, joining the corresponding vertices by an edge x* crossing only x.	IV. G is 5 - colourable

Choose the **correct** answer from the options given below:

1. A - III, B - I, C - II, D - IV
2. A - IV, B - III, C - I, D - II
3. A - II, B - IV, C - I, D - III
4. A - IV, B - I, C - II, D - III

Options :

60348966993. 1

60348966994. 2

60348966995. 3

60348966996. 4

Question Number : 91 Question Id : 60348917796 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A: Every planar graph is 5-colourable

Reason R: If $X'(G) = 3$ for every bridgeless cubic planar graph G, then four colour conjecture holds

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

Options :

60348966997. 1

60348966998. 2

60348966999. 3

60348967000. 4

Question Number : 92 Question Id : 60348917797 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The clique number of W_5 is,

1. 1
2. 3
3. 4
4. 5

Options :

60348967001. 1

60348967002. 2

60348967003. 3

60348967004. 4

Question Number : 93 Question Id : 60348917798 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A: Windmill graph is a perfect graph

Reason R: $\omega(H) = \chi(H)$ for every induced graph H of G

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

Options :

60348967005. 1

60348967006. 2

60348967007. 3

60348967008. 4

Question Number : 94 Question Id : 60348917799 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: All complete graphs are perfect

Statement II: Independence sets of comparability graphs are anti chains.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348967009. 1

60348967010. 2

60348967011. 3

60348967012. 4

Question Number : 95 Question Id : 60348917800 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The entry of q_{ii} in any primitive connection matrix is

1. -1
2. 0
3. 1
4. ∞

Options :

60348967013. 1

60348967014. 2

60348967015. 3

60348967016. 4

Question Number : 96 Question Id : 60348917801 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $x_i = 0$ and $x_j = 0$ are Boolean variables then $x_i + x_j$ is equal to

1. -1
2. 0
3. 1
4. ∞

Options :

60348967017. 1

60348967018. 2

60348967019. 3

60348967020. 4

Question Number : 97 Question Id : 60348917802 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: Transmission matrices are symmetric.

Statement II: All the diagonal entries in the transmission matrices are equal to 0.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348967021. 1

60348967022. 2

60348967023. 3

60348967024. 4

Question Number : 98 Question Id : 60348917803 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The sum of all in degrees of a graph G is 10. Then the sum of all out degrees of G is equal to,

1. 0
2. 5
3. 10
4. 15

Options :

60348967025. 1

60348967026. 2

60348967027. 3

60348967028. 4

Question Number : 99 Question Id : 60348917804 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given below are two statements

Statement I: Every tournament contains a directed Hamiltonian path.

Statement II: A directed closed walk in a directed graph is a walk where $v_0 = v_k$.

In light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

60348967029. 1

60348967030. 2

60348967031. 3

60348967032. 4

Question Number : 100 Question Id : 60348917805 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**

List I	List II
A. G is a digraph with odd number of vertices where each vertex has an odd out degree	I. Graph is Hamiltonian
B. P is a path graph D that visits every vertex in D.	II. Graph contains a directed Hamiltonian path
C. G is a tournament	III. Hand Shaking dilemma
D. In a digraph D, the sum of the out-degree of all vertices is equal to the sum of the in-degree of all vertices, each sum being equal to the number of edges in D.	IV. *D* has odd number of vertices with odd in degree

Choose the **correct** answer from the options given below:

1. A - III, B - I, C - II, D - IV
2. A - III, B - I, C - IV, D - II
3. A - III, B - IV, C - I, D - II
4. A - IV, B - I, C - II, D - III

Options :

60348967033. 1

60348967034. 2

60348967035. 3

60348967036. 4