# Discrete Mathematical Structures Solved MCQs- Part2

MCQs

Multiple Choice Questions

# Discrete Mathematical Structures Solved MCQs- Part2

**How many onto (or surjective) functions are there from an n-element (n > 2) set to a 2- element set?**

- $2^n$
- $2^n - 1$
- $2^n - 2$
- $2(2^n - 2)$

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**A partial ordered relation is transitive, reflexive and**

- Antisymmetric
- Bisymmetric
- Anti reflexive.
- Asymmetric

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

- Total number of edges in a graph is even or odd
- Total number of vertices in a graph is even or odd
- Its degree is even or odd
- None of these

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**Which of the following statements are TRUE?**
**(1) The problem of determining whether there exists a cycle in an undirected graph is in P.**
**(2) The problem of determining whether there exists a cycle in an undirected graph is in NP.**
**(3) If a problem A is NP-Complete, there exists a non-deterministic polynomial time algorithm to solve A.**

- 1,2 and 3
- 1 and 2 only
- 1 and 3 only
- 2 and 3 only

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**If n is an integer and n2 is odd ,then n is**

- even
- odd
- even or odd
- prime

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**How many different words can be formed out of the letters of the word VARANASI?**

- 64
- 120
- 40320
- 720

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**Which two of the following are equivalent for an undirected graph G?**
**(i) G is a tree**
**(ii) There is at least one path between any two distinct vertices of G**
**(iii) G contains no cycles and has (n-1) edges**
**(iv)G has n edges**

- (i) and (ii)
- (i) and (iii)
- (i) and (iv)
- (ii) and (iii)

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**The complete graph with four vertices has k edges where k is**

- 3
- 4

- 5
- 6

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**Which of the following shall be a compound proposition involving the propositions p, q and r, that is true when exactly two of the p, q and r are true and is false otherwise ?**

- A
- B
- C
- D

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**In how many ways can a hungry student choose 3 toppings for his prize from a list of 10 delicious possibilities?**

- 100
- 120
- 110
- 150

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**In any undirected graph,the sum of degrees of all nodes**

- Must be even
- Is twice the number of edges
- Must be odd
- Must be even

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**The number of colours required to properly color vertices of every planar graph is**

- 2
- 3

- 4
- 5

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**The trapzoidal rule for integration gives exact result when integrated is polynomial of degree**

- 0 but not 1
- 1 but not 0
- 0 or 1
- 2

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**Let G be a complete undirected graph on 6 vertices. If vertices of G are labeled, then the number of distinct cycles of length 4 in G is equal to**

- 15
- 45
- 90
- 360

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**Consider an undirected graph G with 100 nodes. The maximum number of edges to be included in G so that the graph is not connected is**

- 2451
- 4950
- 4851
- 9900

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**If two fair coins are flipped and at least one of the outcomes is known to be a head, what is the probability that both outcomes are heads?**

- 1/3
- 1/4
- 1/2

- 2/3

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**A graph G is called a ..... if it is a connected acyclic graph**

- Cyclic graph
- Regular graph
- Tree
- Not a graph

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**In how many ways can a president and vice president be chosen from a set of 30 candidates?**

- 820
- 850
- 880
- 870

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**Let G be a simple undirected planar graph on 10 vertices with 15edges. If G is a connected graph, then the number of bounded faces in any embedding of G on the plane is equal to**

- 3
- 4
- 5
- 6

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**Which of the following pair is not congruent modulo 7?**

- 10, 24
- 25, 56
- -31, 11
- -64, -15

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**The number of nodes in a complete binary tree of height h (with roots**

**at level 0) is equal to**

- $2^0 + 2^1 + ..... 2^h$
- $2^0 + 2^1 + ..... 2^{h-1}$
- $2^0 + 2^1 + ..... 2^{h+1}$
- $2^1 + ..... 2^{h+1}$

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**The relation { (1,2), (1,3), (3,1), (1,1), (3,3), (3,2), (1,4), (4,2), (3,4)} is**

- Reflexive
- Transitive
- Symmetric
- Asymmetric

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**The length of Hamiltonian Path in a connected graph of n vertices is**

- n–1
- n
- n+1
- n/2

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**The number of leaf nodes in a complete binary tree of depth d is**

- 2d
- 2d–1+1
- 2d+1+1
- 2d+1

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**Four fair coins are tossed simultaneously. The probability that latest one head and tail turn up is**

- 1/16
- 1/8
- 7/8

- 15/16

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**Find the number of relations from A = {cat, dog, rat} to B = {male , female}**

- 64
- 6
- 32
- 15

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**Find the number of ways to paint 12 offices so that 3 of them will be green, 2 of them pink, 2 of them yellow and the rest ones white.**

- 55,440
- 1,66,320
- 4.790E+08
- 39,91,680

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**The number of functions from an m element set to an n element set is:**

- mn
- m + n
- nm
- m * n

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**In a graph if e=(u, v) means**

- u is adjacent to v but v is not adjacent to u
- e begins at u and ends at v
- u is processor and v is successor
- both b and c

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**Rank of the matrix Row1 [1,1 ] and Row2[0,0] is**

- 4
- 2
- 1
- 0

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**In any undirected graph the sum of degrees of all the nodes**

- Must be even
- Are twice the number of edges
- Must be odd
- Need not be even

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**Let N = {1, 2, 3, ….} be ordered by divisibility, which of the following subset is totally ordered,**

- (2, 6, 24)
- (3, 5, 15)
- (2, 9, 16)
- (4, 15, 30)

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**Two dice are thrown simultaneously. The probability that the product of the two numbers on the two disc is an even number, is**

- 1/2
- 3/4
- 5/16
- 3/8

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**McCabe's cyclomatic metric V(G) of a graph G with n vertices, e edges and p connected component is**

- e
- n
- e – n + 2p

- e – n + p

---

**Let G be a simple undirected planar graph on 10 vertices with 15 edges. If G is a connected graph, then the number of bounded faces in any embedding of G on the plane is equal to**

- 3
- 4
- 5
- 6

---

**An undirected graph possesses an eulerian circuit if and only if it is connected and its vertices are**

- all of even degree
- all of odd degree
- of any degree
- even in number

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**Consider an undirected random graph of eight vertices. The probability that there is an edge between a pair of vertices is ½. What is the expected number of unordered cycles of length three?**

- 1/8
- 1
- 7
- 8

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- A
- B
- C
- D

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**Length of the walk of a graph is**

- The number of vertices in walk W
- The number of edges in walk W
- Total number of edges in a graph
- Total number of vertices in a graph

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**Number of elements in the power set P(S) of the set S={(Q),1(2,3)}**

- 2
- 4
- 8
- 10

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**A graph is a collection of**

- Row and columns
- Vertices and edges
- Equations
- None of these

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**Hasse diagram are drawn**

- Partially ordered sets
- Lattices
- Boolean algebra
- None of these

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**Number of vertices of odd degree in a graph is**

- Always even
- Always odd
- Either even or odd
- Always zero

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**Which of the following statements is/are TRUE for undirected graphs?**
**P: Number of odd degree vertices is even.**
**Q: Sum of degrees of all vertices is even.**

- P only
- Q only
- Both P and Q
- Neither P nor Q

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**A graph with n vertices will definitely have a parallel edge or self loop of the total number of edges are**

- more than n
- more than n+1
- more than (n+1)/2
- more than n(n-1)/2

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**Cyclometric complexity of a flow graph G with n vertices and e edges is**

- V(G) = e+n–2
- V(G) = e–n+2
- V(G) = e+n+2
- V(G) = e–n–2

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**The statement ( p^q) _ p is a**

- Contingency
- Absurdity
- Tautology
- None of the above

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**Let G be a complete undirected graph on 6 vertices. If vertices of G are labeled, then the number of distinct cycles of length 4 in G is**

**equal to**

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- Neither P nor Q

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**Bag A contains 5 white and 2 black balls .Bag B contains 2 white and 3 black balls .if any one bag is chosen and a ball is taken out of it at random ,what is the probability the ball is black?**

- 31/70
- 1/2
- 5/12
- 3/5