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Description automatically generated

1. **Graph Theory**: 36 marks
2. **Probability and Combinatorics**: 24 marks
3. **Set Theory and Logic**: 16 marks
4. **Mathematical Properties and Theorems**: 14 marks
5. **Graph Isomorphism** - Repeated in multiple sections, assessing understanding of graph properties and equivalency between graph structures.
6. **Probability of Dice Rolls** - Frequently asked, focusing on outcomes when rolling two different colored dice.
7. **Properties of Bipartite Graphs** - Commonly explored topic, including coloring properties and partitioning vertices.
8. **Hamiltonian Paths in Graphs** - Several questions cover the conditions under which a graph contains a Hamiltonian path or circuit.
9. **Probability of Drawing Specific Cards** - Questions related to probabilities in card drawing scenarios appear often.
10. **Combinatorial Problems** - Regularly occurring problems related to combinatorial counting and arrangements.
11. **Properties of Functions and Relations** - Multiple queries on the properties of mathematical functions and relations, including reflexive, symmetric, and transitive properties.
12. **Euler Paths and Circuits** - Discussions on Euler paths and circuits in graphs are frequently presented.
13. **Vertex Cover Problems** - Questions about vertex covers in graphs are a recurring theme.
14. **Set Theory Operations** - Various problems involving operations on sets and their elements are repeatedly examined.

Memory updated

Considering your new syllabus and the analysis of previous years' question bank, here’s a strategy for effectively covering the topics:

**Prioritize High-Occurrence Topics**

1. **Graph Theory**: Continue focusing here since it often has high representation. Review Eulerian and Hamiltonian paths and circuits, spanning trees, graph coloring, and bipartite graphs.
2. **Counting, Mathematical Induction and Discrete Probability**: This area also appears frequently in exams. Ensure you understand the basics of counting, permutations and combinations, and the principles of inclusion-exclusion and probability.
3. **Sets and Relations**: As relations, especially properties like equivalence and partial ordering, often recur, it would be beneficial to thoroughly understand set operations and relation representations.

**New Topics from Syllabus (If Not Previously Covered)**

1. **Mathematical Logic**: Since propositional and predicate logic are fundamental to advanced topics in computer science and mathematics, ensure you understand propositional equivalences, normal forms, and rules of inference.
2. **Group Theory**: This is crucial if you haven't covered it deeply before. Understand the basics of groups, rings, fields, and their applications, focusing on homomorphism and isomorphism properties.
3. **Boolean Algebra**: Essential for computational logic, focusing on boolean functions, simplification techniques, and their applications.

**Topics with Potential Overlaps**

* **Optimization**: This includes linear programming and project scheduling methods like PERT-CPM, which may combine aspects of graph theory (like shortest paths) and algebra.
* **Boolean Algebra and Mathematical Logic**: Both involve logical structuring and are critical for designing computational processes.