

--Question Starting--

Match the following 3-D object representation methods with their key characteristics:

1. 3-D Object Representation Characteristic

- I. Polygon Surfaces A. Representations defined by control points and blending functions for smooth surfaces
- II. Quadric Surfaces B. Polygonal approximation of curved surfaces, often used for rendering
- III. Spline Representation C. Implicit surfaces defined by second-degree algebraic equations
- IV. Bezier and B-Spline Curves D. Parametric curves defined by control points with varying degrees of smoothness

Choose the correct answer from the options given below:

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

Answer Key: 2

Solution:

? Polygon Surfaces: These are polygonal meshes that approximate curved surfaces through flat facets, making them suitable for rendering via rasterization.

? Quadric Surfaces: Defined algebraically, these are smooth algebraic surfaces described by second-degree polynomial equations, such as spheres and ellipsoids.

? Spline Representation: These involve piecewise polynomial functions that ensure smoothness at joins, suitable for complex curves and surfaces.

? Bezier and B-Spline Curves: These are parametric, control-point-based representations, providing flexibility and smoothness in modeling.

Hence, Option (2) is the right answer.

--Question Starting--

3. Match the following topics related to Graph Algorithms with their fundamental properties:

1. Graph Algorithms Property

- I. Breadth-First Search (BFS) A. Finds the shortest path in a weighted graph, possibly with negative weights
- II. Depth-First Search (DFS) B. Explores as far as possible along each branch before backtracking
- III. Shortest Paths C. Traverses the graph level-by-level, using a queue
- IV. Maximum Flow D. Finds the maximum possible flow from source to sink in a network

Choose the correct answer from the options given below:

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

Answer Key: 1

Solution:

? BFS: It explores nodes in order of their distance from the source, level by level, suitable for unweighted shortest path discovery.

? DFS: It goes deep into each branch before exploring others, used for topology and connectivity checks.

? Shortest Paths: Algorithms like Dijkstra's are used for weighted graphs to find minimal paths.

? Max Flow: Algorithms such as Ford-Fulkerson identify the maximum flow possible through a network from source to sink.

Hence, Option (1) is the right answer.