Match the following 3-D object representations with their defining characteristics:
1. Polygon Surfaces 2. Quadric Surfaces 3. Bezier and B-Spline Curves
A. Defined by polynomial equations of degree two or less, commonly used for conic sections and general quadratic surfaces.
B. Piecewise polynomial curves characterized by control points, with Bezier and B-Spline forms providing smooth surface generation.
C. Composed of flat polygons, primarily triangles or quadrilaterals, which approximate complex geometries and are suitable for rendering.
Choose the correct answer from the options given below:
(1) 1-C, 2-A, 3-B
(2) 1-B, 2-C, 3-A
(3) 1-A, 2-B, 3-C
(4) 1-C, 2-B, 3-A
Answer Key: 3
Solution:
? Polygon Surfaces are constructed from flat polygons, enabling approximation of complex geometries through tessellation, which is fundamental in rendering pipelines.
? Quadric Surfaces are algebraic surfaces defined by quadratic equations, such as ellipsoids, paraboloids, and hyperboloids, crucial for representing smooth, continuous shapes.
? Bezier and B-Spline Curves are piecewise polynomial functions that provide smooth, controllable curves and surfaces using control points, widely used in computer graphics for modeling.
Hence, Option (3) is the right answer.

2. Match the following mobile communication concepts with their correct descriptions:
1. GSM and CDMA 2. Middleware and Gateway for Mobile Computing 3. Wireless Networks and Topologies
A. Protocols enabling multiple users over a single frequency band, with GSM based on time division and CDMA on code division techniques.
B. Software layers facilitating communication between applications across heterogeneous systems, often acting as intermediaries.
C. Network configurations such as star, mesh, or hybrid, that define how wireless nodes connect and communicate.
Choose the correct answer from the options given below:
(1) 1-A, 2-B, 3-C
(2) 1-B, 2-C, 3-A
(3) 1-C, 2-A, 3-B
(4) 1-A, 2-C, 3-B
Answer Key: 1
Solution:
? GSM and CDMA are multiple access schemes used in cellular networks; GSM uses time division multiple access, while CDMA employs code division.
? Middleware and Gateway serve as essential software layers enabling interoperability, routing, and management in mobile computing environments.
? Wireless Networks utilize various topologies like star, mesh, or hybrid arrangements to connect mobile nodes efficiently.
Hence, Option (1) is the right answer.

3. Match the following graph algorithms with their characteristic properties:
1. Breadth-First Search (BFS) 2. Depth-First Search (DFS) 3. Shortest Paths
A. Explores neighbors before moving deeper, suitable for level-order traversal and shortest path in unweighted graphs.
B. Recursively explores as deep as possible along each branch before backtracking, useful in topological sorts and cycle detection.
C. Finds the minimum distance from a source to all other vertices, often using Dijkstra's or Bellman-Ford

algorithms.
Choose the correct answer from the options given below:
(1) 1-A, 2-B, 3-C
(2) 1-B, 2-A, 3-C
(3) 1-C, 2-B, 3-A
(4) 1-A, 2-C, 3-B
Answer Key: 1
Solution:
? BFS explores all neighbors at a given depth before moving to the next level, making it ideal for shortest paths in unweighted graphs.
? DFS dives deep into one branch until it cannot go further, which is useful for detecting cycles, topological sorting, and connectivity.
? Shortest path algorithms like Dijkstra's find the minimum distance from the source to each vertex, considering edge weights.
Hence, Option (1) is the right answer.