**Task 3 - Research Question 1**

**4.1 i)** In procedural content generation (PCG), "noise" refers to random or pseudo-random data used to introduce variability or randomness into generated content. In games, simulations, and other PCG applications, different and surprising outcomes are frequently desired, and this randomness is necessary to provide them.

**4.1 ii)** Perlin noise is a way to make random patterns that look smooth. For terrain, it's like creating a height map where higher points mean mountains and lower points mean valleys. By tweaking settings like how bumpy or smooth it should be, you can generate different types of terrain, from flat plains to rugged mountains. It's popular because it creates realistic landscapes in games and simulations.

**4.1 iii)** Based on seed points, Voronoi tessellation partitions space into regions. Every region stands for a distinct sort of landscape, such as forests or mountains. In games and simulations, you can generate a variety of realistic terrain by changing the attributes and seed points of each sector.

**4.1 iv)** The method of midpoint displacement is used to create a natural-looking terrain. A flat surface is first divided, and the central points are then arbitrarily raised. Repeat these steps to construct realistic landscapes with valleys, mountains, and hills, levelling the topography as necessary.

**4.1 v)** Grayscale photos called "splat maps" are used to add textures to landscapes. These maps are combined to produce realistic topography with seamless transitions between materials. Each shade of grey represents a distinct texture. They are frequently utilized to give landscapes in games and simulations more realism and visual depth.

**Task 4 - Research Question 2**

**5.1 i)** Dungeon levels, which are commonly encountered in video games with a fantasy theme, are rooms or parts of a greater underground maze or building. They frequently have chambers, hallways, traps, puzzles, and encounters with enemies, providing obstacles for players to go past while exploring.

**5.1 ii)** Action-adventure, role-playing, and dungeon crawler games are among the genres that frequently feature dungeon levels. Games with dungeon levels include, for example:

* The action-adventure Legend of Zelda series: These games frequently have dungeon levels with adversaries and puzzles that players must solve to advance.
* Diablo series (action RPG): Players explore randomly generated dungeon levels filled with monsters, loot, and challenges.

**5.1 iii)** The arrangement of rooms, hallways, and other architectural elements in a floor plan. Environmental assets include fixtures like doors, walls, stairways, traps, ornaments, and moving parts.

Enemy placements: The places where opponents appear and where encounters are set up.

Distribution of loot: Putting goods, weapons, and other rewards in places other than treasure containers.

Details related to aesthetics: Ambience, lighting, texturing, and atmosphere to improve immersion.

**5.1 iv)** Randomized level generation: Using preset templates or at random, algorithms create layouts for rooms, corridors, and other structures.

Cellular automata: These structures resemble caves and are made of interconnecting chambers and passageways using algorithms that mimic the growth processes of cells.

Tile-based generation: The dungeon layout is created by randomly arranging tiles that represent various terrain types, obstacles, and features, or by following predetermined guidelines.

Procedure generating rules: To guarantee diversity and difficulty, rulesets specify how certain dungeon features, such as room sizes, corridor widths, enemy placements, and loot distribution, are produced.

Iterative refinement: To boost player experience, balance gameplay, and increase connection, generated dungeon layouts may go through iterative refinement processes.