The approach used to solve the problem and the reason for taking up the approach in PDF Format with a details explanation.

I have used the CNN model for the following

Convolutional Neural Networks (CNNs) are commonly used for skin lesion cell detection and analysis due to their effectiveness in capturing spatial patterns and features in images. Here are a few reasons why CNNs are suitable for skin lesion analysis:

1. Local feature extraction: CNNs excel at learning local patterns and features from images. They use convolutional layers to extract low-level features such as edges, textures, and shapes. In the case of skin lesion analysis, CNNs can automatically learn important visual characteristics that distinguish between different types of skin cells or lesions.

2. Translation invariance: Skin lesion images can vary in terms of size, orientation, and position. CNNs are capable of learning translation-invariant features, meaning they can recognize patterns regardless of their location in the image. This property allows CNNs to generalize well to skin lesion images with different spatial configurations.

3. Hierarchical feature learning: CNNs employ multiple convolutional layers to learn hierarchical representations of images. Each layer learns more complex and abstract features by combining information from lower layers. This hierarchy of features enables CNNs to capture intricate and discriminative patterns present in skin lesion images.

4. Classification and segmentation: CNNs can be used for both classification tasks, where the goal is to categorize skin cells or lesions into specific classes, and segmentation tasks, where the objective is to outline or identify the boundaries of lesions. By using appropriate architectures and loss functions, CNNs can learn to classify and segment skin lesions accurately.

5. Availability of large-scale datasets: The field of dermatology has witnessed the development of various large-scale datasets of skin lesion images, such as the HAM10000 dataset. These datasets provide a substantial amount of labeled data, which is crucial for training deep learning models like CNNs.

Overall, CNNs offer a powerful and effective approach for skin lesion cell detection and analysis by automatically learning relevant features and patterns from images, enabling accurate classification and segmentation tasks.

For recurrent neural networks (RNN) with LSTM or generative models, the HAM1000 dataset may not be suitable since it consists of images rather than sequential or generative data. RNNs and generative models are better suited for tasks such as time series forecasting, text generation, or image generation.