**Q: 1**

**Collaborative Task Board Application**

You are required to build a **Task Board Application** using the **MERN stack** where multiple users can collaborate on projects in real-time. The application should include authentication, authorization, board management, tasks with drag-and-drop functionality, and real-time synchronization.

**Note:** You are allowed to use AI tools to assist with solving this question. However, you must use AI **only in chunks/parts**, not for the entire solution at once. The evaluation is designed to test your understanding and ability to integrate complex functionalities.

**Functional Requirements**

**1. Authentication & Authorization**

* Implement **JWT-based authentication**.
* There must be two user roles:
  + **Admin**: Can create boards and invite other users to the board.
  + **Member**: Can only interact with boards they have been invited to.

**2. Boards & Columns**

* Users must be able to create multiple **Boards** (e.g., "Project A").
* Each board should have multiple **Columns** (e.g., "Todo", "In Progress", "Done").
* Only the board creator (Admin) should have permission to delete a board.

**3. Tasks**

* Each column should support multiple **Tasks**.
* Tasks must include the following fields:
  + title
  + description
  + assignedTo (must be a valid board member)
  + dueDate
* Tasks must support the following operations:
  + **Creation** under a specific column.
  + **Drag-and-drop** movement between columns.
  + **Updating** details of the task.
  + **Deletion** of tasks.

**4. Real-Time Updates**

* If one user performs any operation (e.g., creating, moving, updating, or deleting a task), all other users who are currently viewing the same board must see the changes **instantly in real-time**.

**5. Filtering & Search**

* Within a board, users must be able to:
  + Search tasks by **title**.
  + Filter tasks by **assignedTo**.
  + Filter tasks by **dueDate**.

**6. Backend Validation & Constraints**

* Ensure the following constraints at the backend level:
  + A user must not be able to view, move, or update tasks in a board they are **not a member of**.
  + Only Admins should be able to invite users to a board.
  + Only Admins should be able to delete a board.
  + Any drag-and-drop task operation must be validated on the server to ensure the move is authorized.

**7. Activity Logs**

* Every significant action must be recorded as an **Activity Log**, including:
  + Task created.
  + Task moved (with source and destination columns).
  + Task updated.
  + Task deleted.
  + User added to board.
  + User removed from board.
* The log entry must include:
  + Description of the action.
  + User who performed it.
  + Timestamp.

**8. Pagination**

* Implement pagination for tasks inside each column.
* A column should only fetch a **limited number of tasks at a time** (e.g., 10 per page).
* Provide navigation to move between pages.

**Non-Functional Requirements**

* The application must be built using the **MERN stack** (MongoDB, Express, React, Node.js).
* Use **RESTful APIs** for backend communication.
* The frontend must be responsive and handle all required interactions smoothly.
* Real-time updates must be implemented across all collaborative features.

**Submission Guidelines**

1. Push **all your code** in the **Masai GitHub repo** under a folder named for this evaluation.
2. Submit the **folder link only**, **not the entire repo link**.
3. Ensure your code is well-structured and runs without errors before submission.

**Important Notes**

1. **Start your application on your own.**
2. **Strictly do not give the entire question to AI.**
3. You may take help from AI, but **only in chunks/parts**, not for the whole solution at once.
4. Ensure your **internet connection is stable throughout the contest**.
5. **No matter what the reason is**, if you stop screen sharing or get disconnected, you will be **disqualified**.
6. Please check your **internet connection, laptop condition, and electricity backup** before attempting the contest.
7. **Under no circumstances will any disconnection or technical issue be accepted as a valid reason.**