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| **ID** | **Rule Definition** | **Use cases** |
| BR-01 | Customer must pay remaining payment before delivery staff confirm the purchase reservation | UC-01, UC-02 |
| BR-02 | The quote must be approved by the manager before the customer can view it | UC-15 |
| BR-03 | The customer must make payment before reservation staff send specific information | UC-07 |
| BR-04 | The customer needs to deposit 30% of the value of the fish to make an order | UC-04 |
| BR-01 | User must deposit 30% of the value of the fish before making orders | UC-01 |
| BR-02 | All cancellation must take place within 48 hours since reservations are made | UC-11 |
| BR-03 | Airfare and hotel charges cannot be cancelled | UC-11 |
| BR-04 | User must have enough money in the system’s e-wallet upon making purchases | UC-09 |
| BR-01 | Discount for Multiple Pets:  When a customer schedules appointments for two or more pets, they receive a 15% discount on medical examination services. | UC-01, UC-02 |
| BR-02 | Appointment Cancellation Policy:  Customers can cancel appointments 24 hours before the scheduled examination time. If canceled within the stipulated time frame, the system transfers the paid money back to the customer. | UC-04 |
| BR-03 | Approval of Veterinarian Work Schedule:  Veterinarians can register for a work schedule, but it needs approval from the clinic manager.  Only veterinary work schedules approved by the manager can be booked by customers. | UC-08 |
| BR-04 | Authentication for Customer Access:  Customers must log in through an account registered with the system or using a Google account before scheduling an appointment. | UC-03 |
| BR-05 | Encryption of Sensitive Data:  All network transactions involving financial information or personally identifiable information require 256-bit encryption. |  |

BR1: User Authentication: All students must use their official @fpt.com.vn email account to log in and be identified by the system.

BR2: User Hierarchy: User accounts must be structured in a specific hierarchy: Directors oversee campuses, Managers report to Directors, Teachers are managed by Managers, and Students are the end-users.

BR3: Administrative Control: There must be a single, system-wide Admin account.

BR4: Exam Availability: A student can only begin an exam if the exam's official status is "Opening".

BR5: Exam Initiation: An exam can only be started by a Teacher.

BR6: Automatic Submission: An exam must be automatically submitted on behalf of the student when the official exam timer expires.

BR7: Question Display: During an exam, questions must be displayed to the student one at a time per page.

BR8: Grade Visibility: A student is only permitted to see their grade for an exam after they have submitted it.

BR9: Teacher Ownership: Only the Teacher who created an exam is permitted to start it.

BR10: Result Confidentiality: Only the Teacher who created an exam is permitted to view and export the results of that exam.

Non-Functional 1:

Statement 1: All data transferred between the server and the client on the FUPB website must be encrypted using HTTPS with TLS 1.2 or above. The tester can confirm that the connection is encrypted using the right protocols by using security testing tools.

Statement 2: Under typical operating conditions, the system's average response time to database requests cannot be more than 100 milliseconds. This guarantees that users can access and view data from the system rapidly, resulting in a seamless and effective user experience. The tester is useful for evaluating response time performance.

Non-Functional 2:

Statement 1: Under typical operating conditions, the system's average response time to database requests cannot be more than 100 milliseconds. This guarantees that users can access and view data from the system rapidly, resulting in a seamless and effective user experience.

Statement 2: To guarantee that users with disabilities can access and use the system with assistive technology, the system must adhere to WCAG 2.1 Level AA accessibility criteria. Regardless of a user's ability, this criterion tries to make the system accessible and easy to use.

The most critical non-functional requirement for an online exam system is **Performance**, specifically the response time during an active exam. A slow system directly impacts a student's ability to complete the test fairly within the time limit.

**Statement 1: Question Load Time** The time to load the next question page after a student submits an answer must be **less than or equal to 2 seconds** for 95% of requests during a peak load of 500 concurrent students taking an exam.

* + **Source of Number:** The 2-second threshold is a standard usability benchmark for keeping users engaged. For a timed exam, anything longer creates anxiety and wastes valuable time. The 500-user load is a reasonable peak estimate for an exam across five campuses.
  + **Testability:** A tester can use a load-testing tool (like Apache JMeter) to simulate 500 users. If more than 5% of the "load next question" requests exceed 2 seconds, the test **fails**.

**Statement 2: Exam Submission Confirmation** The time between a student clicking "Submit Exam" and receiving a submission confirmation message must be **less than 5 seconds**.

* + **Source of Number:** This is a critical, high-anxiety moment for the student. A confirmation time under 5 seconds assures the user that their work has been securely received without causing undue stress.
  + **Testability:** A tester can script the submission process. If the time from the submit action to the confirmation display is 5 seconds or more, the test **fails**.

The second most critical non-functional requirement is **Security**. The integrity of the entire examination process depends on ensuring only the right people can perform specific actions and that the system is protected from malicious activity.

**Statement 1: Authentication Security** An account must be temporarily locked for **15 minutes** after **5 consecutive failed login attempts**.

* **Source of Number:** This is a standard security practice (recommended by OWASP) to mitigate automated brute-force attacks and prevent unauthorized users from gaining access to the FUExamOnline system.
* **Testability:** A tester attempts to log in with a valid username and wrong password 6 times. The test **passes** if the account becomes locked after the 5th attempt. The test **fails** if they can still attempt a 6th login.

**Statement 2: Authorization Control** A user logged in with a 'Student' role must be denied access to any function reserved for a 'Teacher' (e.g., 'start the exam', 'export the result') **100% of the time**.

* **Source of Number:** This reflects the principle of least privilege. There is zero tolerance for a student accessing teacher-level controls, as even a single breach would compromise the exam's integrity.
* **Testability:** A tester logs in as a Student and attempts to access the URL or API endpoint for a teacher-only function. The test **passes** if the system returns an "Access Denied" or "Forbidden" error every time. The test **fails** if access is granted even once.

Security Requirement:

All user data, including personal information, appointment details, and financial transactions, must be stored securely and encrypted using industry-standard encryption algorithms

The system must enforce strong password policies for user accounts, requiring a minimum password length of 8 characters, including a combination of uppercase and lowercase letters, numbers, and special characters. Additionally, the system should implement mechanisms to prevent brute-force attacks and unauthorized access attempts.