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**Course Code : MCS-213**
**Course Title : Software Engineering**
**Assignment Number : MCA_NEW(1)/213/Assign/2023**

**Last Dates for Submission : 30ᵗʰ April 2023 (for January Session)**
**31ˢᵗ October 2023 (for July Session)**

**This assignment has one question for 80 marks. 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

**Question 1: Assume that you are assigned responsibility of developing an Online Hall Ticket Generation System (OHTGS)for a University. OHTGS should run both on PCs and Mobile Devices. OHTGS will have all fields such as Student's name, Student's Address, Examination Center Code and Address, AadhaarNumber, Programme Code, , Course Codes and Titles (Semester Wise), and Enrollment Number etc. Any student enrolled to any programmewho applied for Examinations should be able to generate and download the Hall ticket. Make necessary assumptions. For developing OHTGS as specified above.**

**(a) Which SDLC paradigm will be selected. You may also suggest a SDLC paradigm that is proposed by you and non-existent as on date. Justify your answer.**
**Ans.**
For developing an Online Hall Ticket Generation System (OHTGS) as specified above, the Agile SDLC paradigm would be the best approach. The Agile methodology focuses on flexibility and adaptability to changing requirements, which is essential for an online system. Moreover, it allows for constant feedback and communication between developers and stakeholders, which is critical in a project that involves multiple users and functionalities. The Agile approach can also enable incremental development, which will help to identify and correct issues early on in the development process.

**(b) List the functional and non-functional requirements.**
**Ans.**
**Functional requirements:**
- Registration of students and their personal information
- Examination center information, including codes and addresses
- Aadhaar number verification
- Programme and course codes and titles for each semester
- Enrollment number generation
- Hall ticket generation and download
- Verification of student credentials
- Notification of any changes in examination schedule
- Payment processing for examination fees

**Non-functional requirements:**
- User-friendly interface for students
- Responsive design for both PCs and mobile devices
- Secure login and verification process
- Fast and reliable processing of data
- Compatibility with different operating systems and devices
- Backup and disaster recovery plan

**(c) Estimate cost. (15 Marks)**
**Ans.**
Cost estimation for OHTGS development: The cost of developing an Online Hall Ticket Generation System will depend on various factors such as project complexity, team size, and timeline. Here is a rough estimate of the cost:
- Development team size: 5 members
- Duration: 6 months
- Hourly rate: $50
- Total development hours: 1500 hours
- Cost estimate: 1500 x $50 = $75,000

**(d) Estimate effort.**
**Ans.**
Effort estimation for OHTGS development: The effort estimation for developing an OHTGS will depend on various factors such as project requirements, team size, and experience. Here is a rough estimate of the effort:
- Development team size: 5 members
- Duration: 6 months
- Total development hours: 1500 hours
- Effort estimate: 1500 hours

Note: The above estimates are rough and may vary depending on the project's actual requirements, team size, and experience.

**(e) Develop SRS using IEEE format.**
**Ans.**

**Software Requirements Specification (SRS) document for the Online Hall Ticket Generation System (OHTGS):**

1. **Introduction**
   The Online Hall Ticket Generation System (OHTGS) is a web-based application that allows students to generate and download hall tickets for their examinations. The system will be accessible from both PCs and mobile devices, and will require students to provide personal information and verify their Aadhaar number before generating the hall ticket. The system will also allow students to view their enrollment numbers, examination center information, and program and course codes and titles for each semester.

2. **Purpose**
   The purpose of this SRS is to define the requirements for the development of the OHTGS. The document will outline the system's features, functionalities, and constraints, and will serve as a reference for developers, testers, and stakeholders involved in the project.

3. **Scope**
   The OHTGS will enable students to register for examinations, generate and download hall tickets, and view their enrollment numbers, examination center information, and program and course codes and titles. The system will be accessible from both PCs and mobile devices, and will require students to verify their Aadhaar number before generating the hall ticket. The system will also notify students of any changes in examination schedules, and will enable payment processing for examination fees.

4. **Definitions, acronyms, and abbreviations**
- OHTGS: Online Hall Ticket Generation System
- Aadhaar: a 12-digit unique identity number issued to Indian residents

5. **Overview of the system**
   The OHTGS will be a web-based application developed using HTML5, CSS3, and JavaScript, and will be accessible from both PCs and mobile devices. The system will consist of a user interface that allows students to register for examinations, verify their Aadhaar number, generate and download hall tickets, and view their enrollment numbers, examination center information, and program and course codes and titles. The system will also enable payment processing for examination fees, and will notify students of any changes in examination schedules.

6. **User requirements**
   The user requirements for the OHTGS are as follows:
- Students should be able to register for examinations by providing personal information such as name and address.
- Students should be able to verify their Aadhaar number before generating the hall ticket.
- Students should be able to view their enrollment numbers, examination center information, and program and course codes and titles for each semester.
- Students should be able to generate and download the hall ticket.
- The system should notify students of any changes in examination schedules.
- The system should enable payment processing for examination fees.

7. **Functional requirements**
   The functional requirements for the OHTGS are as follows:

   **7.1 Registration**
   The system should allow students to register for examinations by providing the following information:
- Name
- Address
- Email address
- Mobile number

   **7.2 Aadhaar verification**
   The system should verify the student's Aadhaar number by checking it against the UIDAI database.

   **7.3 Enrollment number generation**
   The system should generate a unique enrollment number for each student.

   **7.4 Examination center information**
   The system should store information about the examination centers, including codes and addresses.

   **7.5 Program and course codes and titles**
   The system should store information about the programs and courses offered by the university, including codes and titles for each semester.

   **7.6 Hall ticket generation and download**

The system should generate and allow students to download the hall ticket for their examination.

### 7.7 Verification of student credentials
The system should verify the student's credentials before generating the hall ticket.

### 7.8 Notification of changes in examination schedule
The system should notify students of any changes in the examination schedule, including postponements or cancellations.

### 7.9 Payment processing
The system should enable payment processing for examination fees. Students should be able to pay the examination fees through a secure payment gateway integrated with the system.

### 7.10 User management
The system should have user management functionality that allows administrators to manage student accounts and information.

## 8. Non-functional requirements
The non-functional requirements for the OHTGS are as follows:

### 8.1 Security
The system should be secure and protect student information from unauthorized access or tampering. The system should use encryption for sensitive data such as Aadhaar numbers and payment information.

### 8.2 Performance
The system should be able to handle a large number of users simultaneously without slowing down or crashing. The system should also be able to generate hall tickets quickly.

### 8.3 Usability
The system should have a user-friendly interface that is easy to navigate and use. The system should also be accessible from both PCs and mobile devices.

### 8.4 Reliability
The system should be reliable and available 24/7. The system should also have a backup and recovery plan in case of system failures.

### 8.5 Compatibility
The system should be compatible with multiple web browsers and operating systems, including PCs and mobile devices.

## 9. Cost estimation
The cost estimation for the development of the OHTGS will depend on various factors such as the development team's size, location, experience, and the project's timeline. A rough estimate for the development cost is around $50,000-$100,000.

## 10. Effort estimation
The effort estimation for the development of the OHTGS will depend on various factors such as the project's scope, requirements, and complexity. A rough estimate for the effort required is around 2000-3000 person-hours.

## 11. Queries for reports
The OHTGS should be able to generate reports for the following queries:
11.1 Examination center-wise list of enrolled students. 11.2 Course-wise list of enrolled students. 11.3 Program-wise list of enrolled students. 11.4 List of students who have generated hall tickets. 11.5 List of students who have paid the examination fees.

## 12. Specific requirements for PC and mobile device compatibility
The OHTGS should meet the following specific requirements for PC and mobile device compatibility:
12.1 User interface design should be responsive and optimized for mobile devices.
12.2 The system should be compatible with multiple web browsers and operating systems, including PCs and mobile devices. 12.3 The system should have an option for mobile device users to download the hall ticket as a PDF file or image.

**(f) List queries for whom Reports can be generated**
**Ans.**
**Reports can be generated for the following queries:**
- List of students registered for the examination
- List of examination centers and their codes and addresses
- Program and course codes and titles for each semester
- Enrollment numbers for each student
- Hall tickets generated and downloaded
- Payment processing details
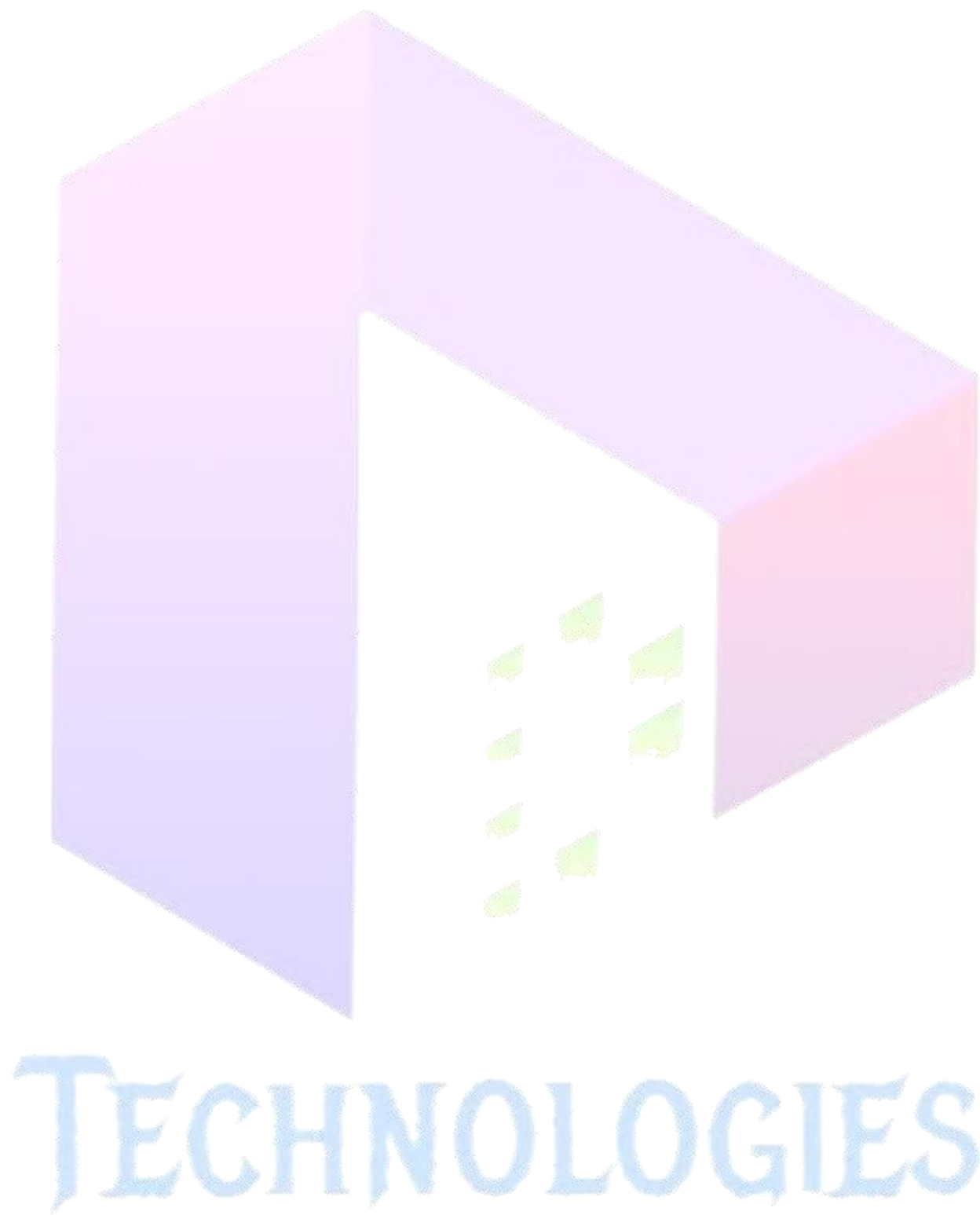- Changes made to examination schedule

**(g) List specific requirements which enables OHTGS to run on both PCs and Mobile Devices**
**Ans.**
**Specific requirements to enable OHTGS to run on both PCs and mobile devices:**
- Responsive design that adapts to different screen sizes and resolutions
- Compatibility with different operating systems and browsers
- Use of web technologies like HTML5, CSS3, and JavaScript
- Support for touch and gesture-based interactions
- Integration with mobile-specific features like camera and GPS