Object Oriented Programming

Assignment # 1

Please read the following instructions:

1. Please provide a complete solution.
2. Plagiarism or Cheating is not allowed. Even if you cheat in only one question, you will be marked zero in the *entire* assignment.
3. To submit: Submission folder will be created on portal
4. Solution should be handwritten and pictures must be added in word file.
5. SECTION: **O4**
6. ROLL NUMBER: **0000000**
7. NAME: **Muhammad Mazhar Rehan**

Please include this declaration of originality of your work in your assignment with your signature:

DECLARATION:

I am aware of and understand the University's policy on plagiarism and I certify that this assignment is my own work, except where indicated by referencing, and that I have followed the good academic practices noted above

Signed: _____

Case Study Project

Education system outlines the backbone of every nation. Technology can play a very crucial role in streamlining the whole system of education. Exploring the technological approach to education, streamlining education process and spiraling acquaintance amongst students, staff, parents and management becomes essential for today's fast growing educational environment. Today every school needs to manage more information than ever before. Without a solid internal infrastructure for teachers, administrators and departments to share data, critical school and student information can be lost, or worse — communicated incorrectly — leading to a host of problems that can affect your school's image and endurance. To remain competitive, school needs a simple solution that can run individual functions, connect their entire operation, use the web as a key communication tool and simplify day-to-day operational responsibilities, giving staff more time with students. The proposed project will be a simple state of the art solution to these problems. Implementing all the operations from basic to advance, it will be a great help for schools at various level to automate their routine tasks including examinations process, grading system, fee payment, student attendance, and news and event management. Functional Requirements: School Management System will be a web based online application which is divided into modules and every module providing following tasks:

Module – 1: User Management Students, parents and teachers will have to register with system to use it. Admin staff member will create account of students, teachers and share account details with them. Parents will be able to register from any location which will be approved by admin. For registration, user name, email id, password, confirm password is required.

Module – 2: Class Room Management Student class information like record of each class and subjects offered in particular class. Students in each class and teachers information for particular class will be maintained in this module. Admin staff will able to maintain information of all courses offered, creation of class like which students are in a particular class, courses offered and teachers who will teach the class.

Module- 3: Examination Management Exams scheduling, date sheet, and results will be manage in this module. Students, teachers and parents will be able to see the report/result card. Teachers will enter student's marks through this module and admin will manage exams schedule and date sheet.

Module- 4: Time Table Management Scheduling of class time, exams date sheet and schedule generation, students will be managed in this module. Teacher will be able to maintain the attendance records of students. Admin will be able to maintain attendance record of teachers and parents will be able to see the attendance of their children.

Question 1: (40 marks)(1 mark for 1 class design and 1 class identification)

Identify and design all classes in above project Modules

1. Student

ID, FirstName, ContactNumber, Gade, Address, Section, emailAddress, Class

2. Parent

ID, FirstName, LastName, Contact_Number, emailAddress, address

3. Teacher

ID, FirstName, LastName, ContactNumber, emailAddress, address, Course

4. Admin

ID, FirstName, LastName, ContactNumber, emailAddress, address, designation

5. Course

CourseID, Name, PrerequisiteCourse, CreditHours

6. Classroom TimeTable

classRoomID, courseID, teacherId, studentId, studentStrength

7. OfferedCourses:

courseCode, Name, PrerequisiteCourse, noOfsections,

8. ExamTimeTable

ExamName, CourseName, CoursId, date, time, classRoomId, SectionId

9. Gade

studentId, studentName, studentResult, CourseId, overAllCourseResult, teacherResult

10. Section

sectionId, sectionName, CourseName, CourseId

11. StudentAttendance

studentId, studentName, courseId, NoOfAbsentes, NoOfPresents, NoOfLeaves

12. TeacherAttendance

teacherId, teacherName, courseId, courseName, TotalAbsences, TotalPresents, Total Leaves

13. Fee Payment:

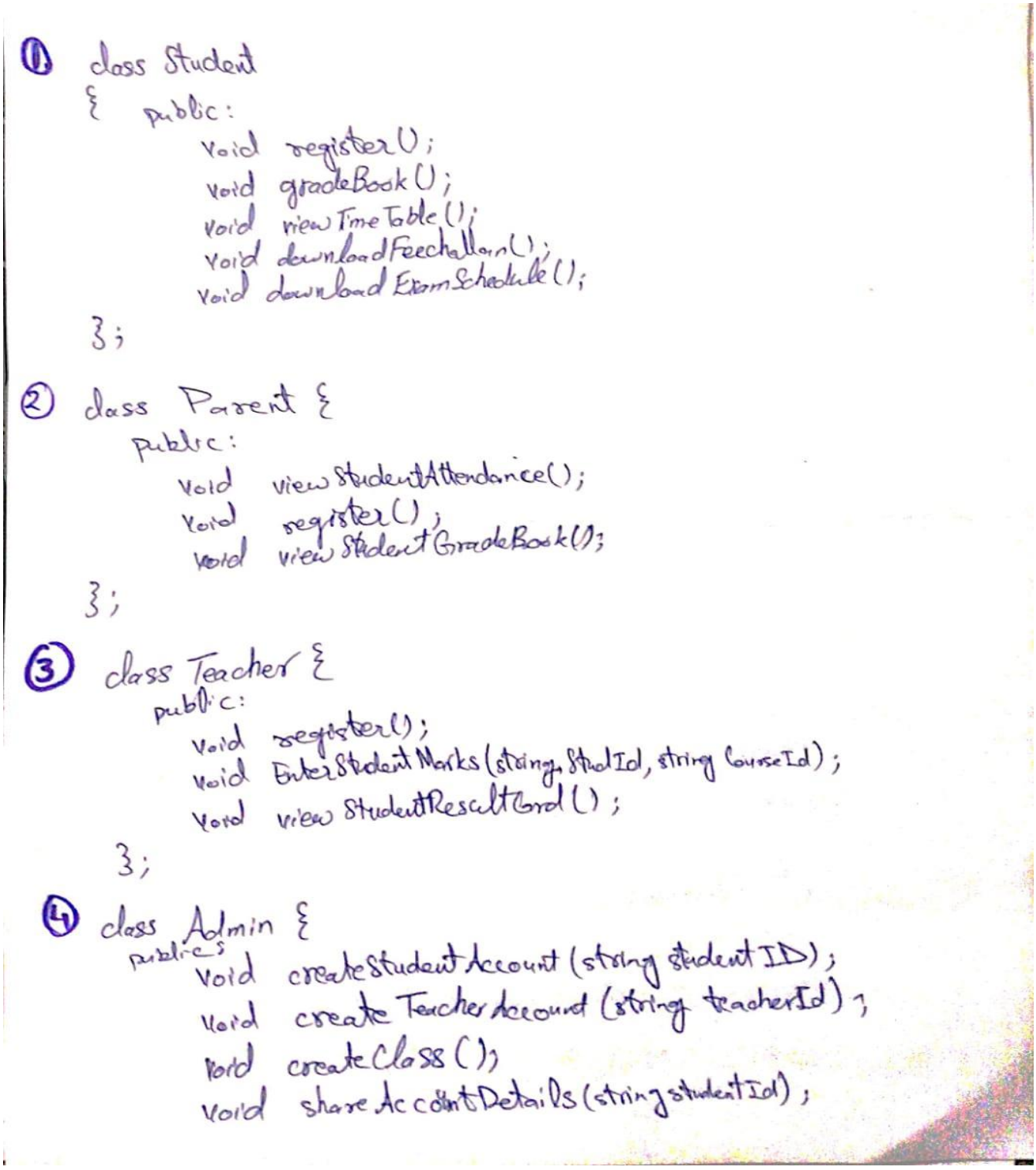
challanformNumber, studentId, CourseId, Coursefee, ~~student~~ status

14. Notification:

description, startDate, EndDate, eventDate, eventtime, eventLocation

Question 2: (Marks: 30)

Write prototype functions of all classes using above project requirements.



```
1. class Student
{   public:
        void register();
        void gradeBook();
        void viewTimeTable();
        void downloadFeechallan();
        void downloadExamSchedule();
};

2. class Parent {
    public:
        void viewStudentAttendance();
        void register();
        void viewStudentGradeBook();
};

3. class Teacher {
    public:
        void register();
        void EnterStudentMarks(string, StudId, string CourseId);
        void viewStudentResultGrad();
};

4. class Admin {
    public:
        void createStudentAccount(string studentID);
        void createTeacherAccound(string teacherId);
        void createClass();
        void shareAccountDetails(string studentId);
```

```
    void shareOfferedCoursesInfo();
    void shareClassTimeTable();
    void maintainTeachersAttendanceRecord(string teacherId);
};
```

⑤
```
class Course {
  public:
    void displayCourse();
    void displayPrerequisites();
    void displayCreditHours();
};
```

⑥
```
class classRoomTimeTable :: public Admin
{   public:
        void generateTimeTable(string classRoomId, string teachId)
        void displayTimeTable(string classRoomId);
};
```

⑦
```
class OfferedCourses :: public Admin
{   public:
        void offerCourse(string courseId);
        void allocateSection(string courseId);
        void allocateTeacher();
        void allocateClassToStudents();
};
```

⑧
```
class ExamTimeTable :: public Admin
{   public:
        void displayExamName();
        void manageExamSchedule();
        void shareDatesheet();
```

(9)
```
class Grade :: public Teacher
{   public:
        void enterStudentMarks();
        void generateStudentResultCard();
        void displayResultCard();
        void displayStudentMarks();
};
```

(10)
```
class Section :: public Admin
{   public:
        void createSections();
        void displayNoOfSections(string CourseId);
        void allocateSectionTeacher();
        void displaySectionTeacherName();
};
```

(11)
```
class StudentAttendance :: public Teacher
{   public:
        void takeStudentAttendance();
        void displayAttendance();
};
```

(12)
```
class TeacherAttendance :: public Admin
{   public:
        void takeTeacherAttendance();
        void showTeacherAttendance();
};
```

(13)
```
class FeePayment
{   public:
        void generateChallanForm();
        void getChallanForm();
};
```

(14) class Notification :: public Admin

```
{   public:
        void generateNotification();
        void displayNotification();
};
```

Question 3: (Marks: 30)

Identify attribute which can be constant or pointer.

Constant Attributes

(1) Student
ID

(2) Parent
Id

(3) Teacher
Id

(4) Admin
Id

(5) Course
CourseCode , CourseName, Credit Hours

(6) ClassRoomTimeTable:
ClassRoomId
~~ClassRoom~~

(7) offered Courses
CourseCode, CourseName, PrerequisiteCours Id

(8) ExamTime Table
CourseId, sectionId, ErumNan

(9) Grade
studentId, CourseId

(10) Section
sectionId, courseId

(11) StudentAttendance
studentId, courseId

(12) TeacherAttendance
teacherId, courseId

(13) Fee Payment
challanform Id, studentID

(14) Notification
—

Pointer Attribute

1. **Student**
   FirstName, LastName , contactNumber , address
2. **Parent:**
   FirstName , LastName , ContactNumber , address
3. **Teacher:**
   FirstName , LastName , address , Course, contact Number
4. **Admin:**
   FirstName , LastName , contactNumber , designation
5. **Course**
   PrerequisiteCourse
6. **ClassRoomTimetable:**
   CourseId , teacherId , studentId , studentStrength
7. **UffferedCourses**
   No of sections
8. **ExamTimeTable**
   CourseName , date , time , classId , InstructorId
9. **Grade**
   StudentName , studentResult , overallCourseResult , teacherRemark
10. **section**
    SectionName , CourseName
11. **Student Attendance**
    studentName , No Of Absentise , No Of Presents , ~~No of Leaves~~

(12) Teacher Attendance

teacherName, CourseName, totalAbsences, totalPresents, totalLeaves

(13) Fee Payment

CourseId, CourseFee, ~~Status~~

(14) Notification

description, eventLocation