Business Description (Scenario)

ABC Education (ABCE) is a private company which owns a number of language/vocational branch colleges in Sydney, Newcastle, Brisbane, Gold Coast, Townsville and Cairns. Each college offers a wide range of English language courses as well as vocational courses from Certificate level up to Advanced Diplomas in a variety of disciplines. In order to meet different local specific conditions or demands each branch college may offer different range of courses.

Each college is managed by a college manager who was hired and allocated by ABCE Head Office. As college managers they have authority to manage any college-related business matters including student enrolment managements, human-resource management, financial/accounting matters, maintenance of college buildings, etc.

Each college manager is expected to send a report to the ABCE Head office in Brisbane periodically or whenever requested. This report summarizes the total revenues in fees collected, student enrolment summary, total expenses in maintenance and staff salary, staff details, courses offered etc.. Currently managers fill out a paper form and mail it back to head office because the computer system is established for each college but is not integrated for the whole ABCE Company. Many college managers have complained that preparing this report is a very difficult and time consuming process. Also, the managers at the head-office also have expressed concerns about the accuracy and verifiability of the reports.

To reduce these concerns and to improve the ease and efficiency with which the college managers and employees conduct their daily business, the company is proposing to development a centralized database that can be used by the managers to track the daily business of their colleges and to prepare their reports. You have been asked to design a database that satisfies many user requirements provided by ABCE. General business description and various user requirements are summarized here:

Each College is organized by department (English Language, Information Technology, Business, and so on). There are two types of staff member working for the college; administrative staff and faculty (academic) member. Each academic member is assigned to a single department but most administrative staff work for overall college level (not for specific department level). All employees in College are working in an office allocated and some offices are shared by multiple people in the college. Every staff employed by a college of ABCE is identified as a unique ABCE staff number and ABCE allows a staff to be re-located from college to college if the staff wish and/or re-staffing is needed accordingly. The staff number is never changed even in this case.

Most departments offer more than one course; for example, the Information Technology department might offer courses in Computing/Networking, Interactive Game Design, and Business Informatics. Each course, however, is offered by only one department. Students can enroll more than one course at the same time, but most students are enrolled for only one. Each student is assigned a faculty member as an advisor for his or her study;

students who do more than one courses are assigned a faculty advisor for each course. One academic member should not be an advisor for more than 30 students at the same time.

A code that has up to three characters (IT for Information Technology, EL for English Language, BU for Business, and so on) identifies each department. A department runs a number of subjects and each subject is identified by the combination of the department code and a three-digit number. The number of credits offered by a particular subject does not vary; that is, all students who pass the same subject receive the same amount of credit. Every subject has at least one text book required and up to 3 supplementary texts. The department secretary needs to make a list of all subjects run in the department and textbooks required for each subject to make an order to the bookshop.

A seven-character code identifies the study-period (some colleges run semesters but others run trimesters) in which a subject is taught in a specific year (for example, SPT12015 represents the trimester 1 of 2015). ABCE’s each college sets all necessary schedules for each study period including the date the study period begins and ends, the date final exams begins and end, and the last withdrawal date.

For a given study period, a department can run multiple classes of a same subject and allocates a different time slot for each class. Each class can be taught by a different faculty (academic member) in the department. The details of every class for all available subjects (subject number/title, class code/name, weekly time schedule, venue, the number of credits generated by the subject, teacher name, maximum enrolment permitted to the class, and the prerequisites for the subject) are provided to students before each semester commences and students use them to indicate the classes in which they want to enroll. If a student fails the subject in a semester (or trimester), the student may take the subject again later (in another semester or trimester).

Before making the enrolment process for a semester or trimester, every student has to submit a registration request form to request classes for the upcoming semester (or trimester). Students indicate the classes for which they want to register by entering each class’s code. For each of these classes, students may also enter a code for an alternative class in case the first requested class is full. After all students have been assigned to classes, the system produces a student schedule form, which is mailed to students so that they know the classes in which they have been enrolled. This form shows the schedule for an individual student for the indicated semester.

After all students have completed the enrollment process for a given semester (or trimester), each faculty member receives a class list for each class he/she will be teaching. In addition to list the students (student number and name) in each class and general details of the class (department name, subject name, class code/name, semester, credits, weekly class time, days and venue), the class list provides space to record the grade each students earns in the subject. At the end of the semester (or trimester), the faculty member enters the students’ grades in this list and sends a copy of the list to the records office, where the grades are entered into the database.

After a staff of the records office posts the grades (by entering them into the database), the DBMS generates a report card for each student. The report card shows the list of subjects the students took during the semester. For each subject taken, the following details are reported; subject name, department name of the subject, subject title, grade, credits earned and grade points. The report also shows the summary of the current semester totals and cumulative totals including credits earned, GPA, Total Points, and so on. The report card also contains the student’s permanent address and a local (alternative) address (if different). Then the report cards are mailed to the addresses printed on the report card. The grades earned by a student become part of his/her permanent record and will appear on the student’s transcript.

Students can request to get his/her “Full Academic Records” at any time (before or after completing his/her college course). This report lists complete information about a student; including his/her course(s) undertaken, department, academic advisor(s), all

grades/credits received to date.

In some situations, employees at ABCE (head office or any college) may require reports to manage information about faculty members. This report lists all faculty members by college / department and contains each faculty member’s ID number, name, address, office location, phone number, current rank (Associate Lecturer, Lecturer, Senior lecturer, Associate Professor, or Professor), and starting date of employment. It also lists the number, name, local / permanent addresses of each faculty member’s advisees. It also shows the employment history of specific faculty members.

Employees at ABCE also may need to generate a report about a specific subject, a specific department or a specific college. A subject report (for each subject) lists the code and name of the department that is offering the subject, the subject number, the description of the subject, the number of credits awarded, and the department and subject number for each prerequisite subject. Similarly, a department report (for each department) lists details of a department including name, location, a head of department (one faculty member is selected as a head of department), name/office/phone number of each academic member of the department, the location of the department office, phone number, etc. A college report lists relevant information in a similar way.

ABCE has a supply of computers (PCs or laptops) or other equipment that it hires out to faculty members or students for a fee which varies from item to item. Most staff or students use their own PCs or laptops but not all faculty members or students have their own machine. The secretary in the hire office needs to generate reports to show for each machine owned by the College, the item number, description, purchase date and price and, if it is on hire, the name of the faculty member or the student who is currently hiring it. A department may need to request a report showing the list of faculty members or students in the department who hires any college equipment and the details of the equipment hired by them.