NATIONAL SCHOOL OF BUSINESS MANAGEMENT
SE201.3 – System Analysis and Design
Model Paper

Case Study for the questions given below.

<u>BRIGHT WAY University</u>

BRIGHT WAY is a university offering various higher education programs. The university employs a young crowd of academic and non-academic staff members those who run the daily works related to student management, academic management, and other supportive activities.

BRIGHT WAY wants to implement a computerized information system to support the management of their daily works which is currently handled manually. This decision is made as the staff members already use personal computers for their daily work and the university is financially stable. This system will include student admission management, and lecture management as described below in more detail.

If a student wishes to enroll with BRIGHT WAY, he has to apply for admission online. For this the students first fill in an online form. After a student has submitted the online form, a PDF document is generated and the student is requested to download it, sign it, and send it by post together with the supportive documents. If the student satisfies all the admission criteria he/she receives his enrollment details via email. Else a rejection notification is sent to the student by email. The admissions clerk upload the supportive documents sent by students to the system and these documents are saved in student database. When student visits the university premises for seminars, the admission clerk generate the Student ID and Academic Schedules through the system and hand them over to the respective student.

The program manager is responsible for managing all the seminars occurring at BRIGHT WAY. At the beginning of a new semester, he starts start planning the semester. For this he enters all the information about upcoming seminars to the system. Using this information the system generates the semester time tables and lecturer agreements and store them in Timetable data base and Agreements data base respectively. Program manager downloads the generated time tables and lecturer agreements. Students and lecturers receive the time tables via email. Lecturers can sign the respective agreements at program manager's office before commencing the semester.

Question 01

1) Produce a context level data flow diagram to represent management of the daily work at BRIGHT WAY described in the case study.
2) Produce the Level 0 data flow diagram based on the answer you gave for the part 1.

Question 02

1) Provide a brief explanation of the following concepts in object orientation.
   a. Inheritance
   b. Encapsulation
   c. Object

2) Consider the following extra information about BRIGHT WAY. Using these information create a class diagram. Include minimum three attributes for each class.

   "BRIGHTWAY consists of departments and offices. One office acts as a head–quarter of all offices. Lecturers and students are allocated to departments. One student/lecturer can have only one department. A lecturer has a name, address, phone number, e mail address, and salary. A student has also a name, etc., but no salary. A student, however, has an average mark (of the final marks of his or her seminars).

   A seminar has a name and a number. When a student is enrolled in a seminar, the marks for this enrollment are recorded and the current average as well as the final mark can be obtained from the enrollment. One lecturer teaches one or two seminars. Each lecture has at least one and at most three seminars. There are two types of seminars: degree and diploma."

Question 03

1) Describe the following relationships that can be found in a use case diagram. You should provide the notation and an example for each relationship.
   a. Extend
   b. Include

2) Following are some extra information about student admission management, and lecture management at BRIGHT WAY. Using this information and the details given in the case study, create a use case diagram.

   "When the admission clerk uploads the documents students sent by post or generating Student ID and Academic Schedules, he can get help from the step by step guidance provided by the system. To complete planning a semester, the program manager has to fill up a contact details form in the system for each academic staff member."

Question 04

Following are additional information about *Apply Online Admission* use case of the BRIGHTWAY system. Using this information create a sequence diagram for this use case.

"When applying the online admission the student first has to open a new application form. Then he enters all the required information in to it and submit the application to the system. Then the system matches the student's NIC with existing students' NICs in the 'Student data base'. If the NIC already exists an error message is displayed and then a new application will be loaded by the system. Else the application acceptance message is displayed. Then the student can start download the PDF of the application."

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